



**BY ELECTRONIC MAIL TO Chris.Murray@kapsch.net, Michael.Hofer@kapsch.net, John.Freund@kapsch.net**

April 14, 2017

Christopher F. Murray, President and CEO  
Kapsch TrafficCom IVHS Inc.  
8201 Greensboro Drive, Suite 1002  
McLean, VA 22102

**SUBJECT: RFP NO. 2017-B-04, REPLACEMENT TOLL COLLECTION SYSTEM**

Dear Mr. Murray:

The Board of Directors of the Golden Gate Bridge, Highway and Transportation District authorized award of a contract relative to the subject procurement to your company at its meeting on March 24, 2017.

Attached, for your files, is the fully-executed Contract. The component parts were sent to you via e-mail on March 30, 2017. This letter serves as your Notice to Proceed, effective April 14, 2017.

If you have any questions, please contact Project Manager Jennifer Mennucci at (415) 923-2358.

If I may be of further assistance, please do not hesitate to contact me at (415) 923-2229.

Sincerely,

A handwritten signature in black ink that reads "Aida S. Caputo". The signature is written in a cursive style.

Aida S. Caputo  
Contracts Officer

Attachments

c: A Ko-Wong, J Wire, J Mennucci, B Garrity, A Davenport, S Toll, J Dion, M Chun, S Miller, L Duncan, District Secretary's Office, Contracts Office (by electronic mail only)

**RFP No. 2017-B-04, Replacement Toll Collection System**  
**AGREEMENT**

## **RFP No. 2017-B-04, Replacement Toll Collection System**

### **AGREEMENT**

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## RFP No. 2017-B-04, Replacement Toll Collection System



### AGREEMENT

THIS AGREEMENT is made as of this 14th day of April, 2017 by and between the GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT (hereinafter referred to as "District") and KAPSCH TRAFFICCOM IVHS INC. (hereinafter referred to as "Contractor").

### RECITALS

WHEREAS, District desires to engage Kapsch TrafficCom IVHS Inc. to develop, test, install, implement, and maintain a Toll Collection System and has issued a Request for Proposals dated October 26, 2016, a copy of which is attached and incorporated as Exhibit A; and

WHEREAS, the Contractor desires to furnish such services and has submitted a final Proposal dated December 9, 2016, a copy of which is attached and incorporated as Exhibit B; and

WHEREAS, at its meeting on March 24, 2017, the District's Board of Directors authorized the award of this Agreement to Contractor.

NOW, THEREFORE, the Parties agree as follows:

### TERMS AND CONDITIONS

#### 1. DEFINITIONS

**1.1** Agreement means the Agreement between District and the Contractor, including all incorporated attachments and exhibits. Agreement is sometimes referred to as "Contract" or "contract" in the SOW.

**1.2** Commercial Off-the-Shelf Software or COTS means Third Party Software that is commercially available to the general public and for which maintenance and support services are likewise commercially available to the general public.

**1.3** District Personally Identifiable Information, or District PII, means any PII relating to District (including without limitation District customers) collected, owned, licensed, maintained, or accessed by Contractor in the course of performing the Work for District under this Agreement.

**1.4** Effective Date means the date entered in the Agreement indicating that both parties have agreed to, and have executed, the Agreement.

**1.5** Final Acceptance means completion, to District satisfaction, of all the requirements for System Acceptance set forth in Section 2.2.6 of the Scope of Work (SOW).

**1.6** Go-Live means the date the System is first used for actual collection of District toll revenue and marks the commencement of the final System Acceptance Test.

**1.7** Governmental Body means any federal, state, regional or local legislative, executive, judicial or other governmental board, city, authority, commission, administration, court or other body, or any official thereof duly authorized to act on its behalf, having jurisdiction over a Party or over any aspect of (1) the Parties' performance of their obligations under this Agreement or (2) the subject matter of this Agreement.

**1.8** Party or Parties means either or both District and Contractor. Contractor is also referred to as the Technical System Integrator, or TSI.

**1.9** Personally Identifiable Information, or PII, means any information that identifies or describes a person including, but not limited to, name, travel pattern data, address, telephone number, email address, license plate number, photograph, bank account information, credit card number, other payment account information, and login information.

**1.10** Project Schedule means the Master Project Schedule specified as a deliverable for Phase 1.1 and referenced in Section 2.1.6.2 of Exhibit A.

**1.11** RFP means District's Request for Proposals No. 2017-B-04 for a new Toll Collection System, issued on October 26, 2016.

**1.12** Scope of Work, or SOW, means the scope of work included as an exhibit to the RFP.

**1.13** Software means any and all programs, code, applications, firmware, and software to be delivered by Contractor under this Agreement.

**1.14** Subcontract means an agreement or purchase order between Contractor and any Subcontractor.

**1.15** Subcontractor means any person or entity retained by Contractor as an independent contractor to perform a portion of the work that is the subject of this Agreement and includes all vendors and suppliers.

**1.16** System means the Toll Collection System to be delivered by Contractor under this Agreement, including without limitation each, every, and all systems, subsystems, components, constituent parts (whether hardware, software or anything else).

**1.17** Third Party Software means Software for which the copyright and/or other intellectual property rights are owned by a Subcontractor.

**1.18** Work means all the services, including the provision of the System and its subsequent maintenance, to be provided by the Contractor under this Agreement, whether directly, through Subcontractors, or otherwise.

## 2. CONTRACTOR REPRESENTATIONS AND WARRANTIES

In the performance of the Work, the Contractor represents and warrants that:

Professional Expertise. It has and will exercise the degree of professional care, skill, efficiency, and judgment of contractors with special expertise in customer information system and meter data management technology; that it carries all applicable licenses, certificates, and registrations in current and good standing that may be required to perform the work; and that it will retain all such licenses, certificates, and registrations in active status throughout the duration of this engagement.

Intellectual Property Rights. The System (and each and every part of the System)—and any use of the System (and each and every part of the System) licensed or otherwise allowed under or arising directly or indirectly from this Agreement by District (or its officers, directors, agents, or employees)—does not and will not infringe or violate the patent, copyright, trade-secret, or other intellectual-property or proprietary rights of any third party. Contractor further represents and warrants that it has or will have all appropriate licenses, agreements, or ownership rights pertaining to all U.S. patent, copyright, trade-secret, or other intellectual-property or proprietary rights needed for the performance of its obligations under this Agreement—including without limitation that it will have all necessary rights to use patentable (in the U.S.) or copyrightable materials, equipment, devices, or processes not furnished by District used in or incorporated in the Work or the System. Contractor assumes all risks arising from the use of any such U.S. patented or copyrighted materials, equipment, devices, or processes.

Existence and Powers. Contractor is a [insert type of entity] duly organized, validly existing and in good standing under the laws of the State of California, and has the authority to do business in the State of California. It has the full legal right, power, and authority to own its properties and to carry on its business as now owned and operated and as required by this Agreement.

Corporate Authorization and Binding Obligation. Contractor has the authority and legal capacity to enter into and perform its obligations under this Agreement. This Agreement has been duly authorized, executed and delivered by all necessary corporate action of Contractor and constitutes a legal, valid and binding obligation of Contractor, enforceable against Contractor in accordance with its terms, except to the extent that its enforceability may be limited by bankruptcy, insolvency or other similar laws affecting creditor's rights from time-to-time in effect and equitable principles of general application. The persons signing this Agreement on behalf of Contractor have authority to do so.

No Conflict. Neither the execution and delivery by Contractor of this Agreement nor the performance by Contractor of its obligations in connection with the transactions contemplated hereby or the fulfillment by Contractor of any terms or conditions hereof to the best of its knowledge: (a) conflicts with, violates or results in a breach of any constitution, law or governmental regulation, bylaws or certificates of incorporation applicable to Contractor; or (b) conflicts with, violates or results in a breach of any order, judgment or decree, or any contract, agreement or instrument, to which Contractor is a party or by which Contractor or any of its properties or assets are bound, or constitutes a default under any of the foregoing.



No Litigation. Except as disclosed in writing to District before the Effective Date of this Agreement, there is no legal proceeding, at law or in equity, before or by any Governmental Body, pending or, to the best of Contractor's knowledge, overtly threatened or publicly announced against Contractor, or any of its affiliates or its parent or subsidiary corporations, or otherwise affecting Contractor, in which an unfavorable decision, ruling, or finding, in any single case or in the aggregate, could reasonably be expected to have a material and adverse effect on the execution and delivery of this Agreement by Contractor or on the validity or enforceability of this Agreement against Contractor, or any other agreement or instrument entered into by Contractor in connection with the transactions contemplated in this Agreement, or on the ability of Contractor to perform its obligations under this Agreement or any such other agreement or instrument, or on the financial condition of Contractor.

Claims and Demands. Except as disclosed in writing to District before the Effective Date of this Agreement, there are no material and adverse claims and demands based in contract or tort law pending or, to the best of its knowledge, threatened against Contractor, or any of its affiliates or its parent or subsidiary corporations, with respect to any project similar to the one that is the subject of this Agreement.

Title. Contractor warrants that it owns or will own, and has or will have, good and marketable title to all goods, materials, equipment, tools, supplies, or systems furnished or to be furnished, by it and its Subcontractors that become part of the System, free and clear of all encumbrances. Contractor warrants that any title conveyed under the terms of this Agreement will be good and that all goods, materials, equipment, supplies, or systems, will be delivered free from all security interests or other liens or encumbrances. Contractor also agrees to defend the title against all persons claiming the whole or part of any goods, materials, equipment, supplies, or systems.

System. Contractor warrants that the System will comply in all material respects with the requirements of the SOW and of its Proposal, that it will operate at the reliability and availability rates specified in the SOW, and that it will be free of defects in design, material, and workmanship.

Disclaimer

THE EXPRESS WARRANTIES PROVIDED HEREIN ARE EXCLUSIVE AND IN LIEU OF ANY IMPLIED WARRANTIES INCLUDING THOSE FOR MERCHANTABILITY, FITNESS FOR PURPOSE AND NON-INFRINGEMENT.

**3. COMPONENT PARTS OF THE AGREEMENT**

This Agreement consists of the documents listed below, each of which is incorporated into the Agreement by this reference. The individual components of the Agreement are intended to be complementary to each other in that what is required by any one of them is as binding as if called for by any or all of them. In the event of any inconsistency between or among the documents making up the Agreement, they are listed below in order of precedence. The Agreement includes:

1. Executed Amendments to the Agreement;
2. The Agreement executed by the Parties;

3. District's Request for Proposals (Exhibit A), issued on October 26, 2016, as modified by addenda, and including all exhibits and attachments;

4. Contractor's final proposal made up of its proposal submitted on December 9, 2016, as modified by revised Subsection D.3.10, submitted on February 27, 2017, and a revised Requirements Traceability Matrix, submitted on March 4, 2017 (collectively, Exhibit B).

5. The Performance Bond.

#### **4. SCOPE OF SERVICES**

**4.1** The Scope of Contractor's services includes those set forth in the RFP, Exhibit A, as supplemented by Contractor's final proposal, Exhibit B.

#### **5. TERM**

**5.1** The Term of this Agreement will commence on the Effective Date. Contractor will begin work upon District issuance of a Notice to Proceed and will proceed according to the Project Schedule set forth in SOW Section 2.1.6. The Contractor may not alter the Project Schedule without District written approval. Contractor must achieve Go-Live no later than December 28, 2018. Unless terminated sooner pursuant to Section 29, the term of this Agreement also includes a five-year maintenance period, commencing upon Go-Live, with three optional one-year extension terms to be exercised by the District in its sole discretion. The one-year extension terms are automatic and the District will notify Contractor at least 60 days prior to the expiration of the base term, or extension term, if it does not want to exercise the option for the following year.

#### **6. COMPENSATION**

**6.1** Implementation Compensation. For all Work up to and including Final Acceptance, the District will pay the Contractor the fixed price of \$3,237,139. The fixed price is all-inclusive of costs and expenses including but not limited to travel, meals and telephone, and any and all labor, material, software licenses, profit, overhead, insurance, taxes, and subcontractors costs incurred by the Contractor. District will pay the Contractor according to the milestone schedule set forth in the Price Proposal Sheet 2: Implementation Milestone Payment Allocation.

**6.2** The fixed price in Section 6.1 is premised on a seven-lane solution as quoted in Contractor's Price Proposal. The District reserves the right, in its sole discretion, to direct the Contractor to implement a five-lane or six-lane solution instead of the seven-lane solution. If the District determines to provide such direction, it must provide written notice to Contractor no later than the deadline for Deliverable 2.2, Gantry Details Drawings (currently scheduled for June 29, 2017), as specified in Appendix B of the SOW, Milestone Schedule. The pricing set forth in Contractor's Price Proposal for a five-lane or six-lane solution will apply so long as the District provides notice in accordance with this paragraph.

**6.3** Maintenance Compensation For the maintenance services that commence upon Go-Live, the District will pay the Contractor the fixed monthly amount of \$30,673.58. This amount is all inclusive of costs and expenses including but not limited to travel, meals and

telephone, and any and all labor, material, third-party maintenance and support agreements, profit, overhead, insurance, taxes and all subcontractor costs.

**6.4 Performance Assessments During the Maintenance Period.** The District requires a system that performs at a high level of accuracy and availability. The cost of the System, and the monthly maintenance payments, are in recognition of the requirement and expectation of high performance requirements. To the extent that, at any time after Go-Live, the System does not meet the performance requirements set forth in Section 11 of the SOW, the District will not have received the benefit of the bargain of this Agreement and in addition will suffer damages that may be difficult to determine with precision at the time of contracting. The Parties therefore agree that the following performance assessments will apply. These assessments are not penalties but are a reflection that diminished System performance will result in the District incurring damages and/or in the District not receiving the benefit of the bargained-for System performance. The parties agree that the performance assessments set forth in Section 6.4 do not represent consequential damages subject to the waiver in Section 20.8.

**6.4.1 Lane Availability.** If the Lane system does not meet the Availability requirements set forth in SOW Section 11.1.2, the Contractor will be responsible for the District's lost toll revenues resulting from a failure of the Lane system to meet the Availability requirement. The Parties agree that the District's losses will be calculated as the difference between (a) the average toll revenue normally collected during the period of unavailability during the previous four weeks for the same time of day and day of the week, and (b) actual toll revenues collected during the period of unavailability. For example, if the Lane system is unavailable from 6am-8am on a Monday, the Contractor will reimburse the District the difference between the amount of tolls it actually was able to collect between 6am-8am on that Monday and the average amount of tolls it has collected during the previous four Mondays between 6am-8am.

The District will prepare a quarterly audit demonstrating any periods of Lane system unavailability, and the calculation specified in the preceding paragraph. If the Contractor disagrees with the District's quarterly audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for actual lost toll revenues, or the amount thereof, will be handled pursuant to Section 27. The District may deduct the amount owed by Contractor from any moneys otherwise due the Contractor or if necessary the Contractor will reimburse the District for the amount owed.

**6.4.2 Host Availability.** If the Host system is unable to perform one or more of the functions to the Availability requirements designated in SOW Section 11.1.2, it is considered unavailable. The District may assess \$1,000 for every hour that the Host system is unavailable over the allowed weekly limit. The District will prepare a monthly report showing any time the host system is unavailable and will deduct the assessment from the monthly maintenance payment otherwise due. Any amount owed in excess of the monthly maintenance payment will be carried over to the next month. If the Contractor disagrees with the District's audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27.

6.4.3 Transaction Accuracy. A transaction is either accurate or not, as specified in SOW Section 11.1.3. A transaction that does not contain all of the information specified in SOW section 11.1.3.3 is inaccurate. For every inaccurate transaction over the allowed error rate, the District may assess an amount equal to the then-current pay-by-plate toll for a two axle vehicle. The District will prepare a quarterly audit showing all transaction inaccuracies in the previous quarter. If the Contractor disagrees with the District's quarterly audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27. The District may deduct the assessment from any moneys otherwise due the Contractor or if necessary the Contractor will reimburse the District for the amount owed.

6.4.4 Transaction Processing. Transactions must be processed in accordance with SOW Section 11.1.4. Any time a transaction (or batch of transactions) is not transmitted to the RCSC within 48 hours of the transaction occurrence in the Lane, the District may assess \$1,000. The District will prepare a monthly report showing all transactions not processed within 48 hours and will deduct the assessment from the monthly maintenance payment otherwise due. Any amount owed in excess of the monthly maintenance payment will be carried over to the next month. If the Contractor disagrees with the District's audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27.

6.4.5 Automatic License Plate Recognition (ALPR) ALPR accuracy must meet the requirements of SOW 11.1.5. Any time the ALPR accuracy is greater than the allowable 0.1% error rate for images that the System deems acceptable to bypass human review, the District may assess \$10 for each incorrect license plate number (or state) that is greater than the allowable 0.1% error rate. The District will prepare a monthly audit showing all inaccurate license plate reads and will deduct the assessment from the monthly maintenance payment otherwise due. Any amount owed in excess of the monthly maintenance payment will be carried over to the next month. If the Contractor disagrees with the District's audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27.

6.4.6 All Assessments. In no event will the Contractor be responsible for lost revenues, or other performance assessments, resulting from acts of God or of the public enemy, fire, floods, epidemics, labor disputes, significant traffic incidents beyond the reasonable control of the Contractor, or other causes deemed by the District to be beyond the reasonable control of the Contractor.

## **7. MANNER OF PAYMENT**

**7.1** Upon satisfactory completion of an implementation milestone set forth in Section 6.1, the Contractor may invoice the District for the amount of the milestone. All invoices must include the Contract number, the milestone description, and a certification that the milestone has

been satisfactorily completed. The District shall endeavor to pay all approved invoices within thirty (30) days of their receipt.

**7.2** During the maintenance phase, no later than the fifteenth day of each month, the Contractor may submit an invoice for the monthly maintenance and support services costs for the previous month. The District will endeavor to pay all approved invoices within thirty (30) days of their receipt, subject to the performance assessment audit procedures set forth in Section 6.

**7.3** Title to Goods. Title to all hardware and any other equipment that is part of the System provided by the Contractor (including any spare equipment) passes to the District upon payment by the District of the invoice for the milestone that includes delivery of applicable equipment.

**7.4** Invoices shall be sent via electronic mail to [accountspayable@goldengate.org](mailto:accountspayable@goldengate.org). The District's preferred method of payment is via credit card. The District may issue a Purchase Order and, in some cases, either provide a credit card for payment at the time of ordering or pay subsequent invoices by credit card upon receipt of goods or services in good order. The District reserves the right to make payment by ACH or check as it deems necessary. Unless payment is made by credit card at time of order or point of sale, a separate invoice shall be issued for each shipment of material or service performed, and no payment shall be issued prior to receipt of material or service and correct invoice.

## **8. ERRORS, INCONSISTENCIES, OMISSIONS**

Contractor must promptly notify District of all errors, inconsistencies, omissions, and/or non-conformities that it discovers in any District specifications or instructions and, in instances where such errors, inconsistencies, omissions and/or non-conformities are discovered, must obtain specific instructions in writing from District before Contractor proceeds with any work so affected. Any work so affected which is performed prior to District's decision must be performed at the Contractor's sole risk. Contractor may not take advantage of any apparent error, inconsistency, omission, and/or non-conformity. District will be entitled to make such corrections and interpretations as District may deem necessary for the fulfillment of the intent of this Agreement. Omissions or incorrect descriptions of any work that are manifestly necessary to carry out the intent of this Agreement, or that are customarily performed, do not relieve Contractor from performing such work and Contractor must perform such work as if fully and correctly set forth in this Agreement.

## **9. NOTICES**

All communications relating to the day-to-day activities of the Work must be exchanged between District's Project Manager or designee, and the Contractor's Project Manager.

All other notices and communications deemed by either Party to be necessary or desirable to be given to the other Party must be in writing and may be given by personal delivery to a representative of the Parties or by mailing the same postage prepaid, addressed as follows:

If to District: Golden Gate Bridge, Highway and Transportation District  
Administration Building  
Golden Gate Bridge Toll Plaza  
P.O. Box 9000, Presidio Station  
San Francisco, CA 94129-0601  
Attention: Aida Caputo, Contracts Officer

If to the Contractor: Kapsch TrafficCom IVHS Inc.  
8201 Greensboro Drive, Suite 1002  
McLean, VA 22102  
Attention: Christopher F. Murray, President and CEO

The address to which mailings may be made may be changed from time-to-time by notice mailed as described above. Any notice given by mail will be deemed given on the day after that on which it is deposited in the United States Mail as provided above.

## **10. OWNERSHIP OF COPIES OF WORK**

The District has exclusive ownership of all data relating to toll transaction generated by the System. Any and all copies (whether physical or electronic) of any works of authorship or any other materials prepared, or in the process of being prepared, for the Work to be performed by Contractor under this Agreement will be and are the property of District. District will be entitled to access to and copies of any such materials during the progress of the Work under this Agreement. Any such materials remaining in the hands of the Contractor or in the hands of any Subcontractor upon completion or termination of the Work under this Agreement must be immediately delivered to District. Except as provided in Section 13, Data Privacy and Security, if any such materials are lost, damaged, or destroyed before final delivery to District, Contractor will replace them at its own expense and the Contractor assumes all risks of loss, damage, or destruction of or to any such materials. Contractor may retain a copy of any such materials for archival purposes or use in its general business activities to the extent permitted under this Agreement.

## **11. INTELLECTUAL PROPERTY RIGHTS**

**11.1** For the sole purpose of installing, operating, and maintaining the District's toll collection system, Contractor grants to District a perpetual, limited, royalty-free, non-exclusive and irrevocable license for District (including without limitation its officers, directors, employees, contractors, and agents) to install, use, copy, modify, and maintain the System (and each and every part of the System, including all Software), with no limitation on the number of sites or users. For further clarity, and without limitation to the generality of the foregoing, this grant of license includes without limitation:

11.1.1 rights to practice any inventions owned, controlled, or licensed by Contractor (or any of its Subcontractors) (or any of its or their parent, subsidiary, sister or otherwise affiliated or related companies) as reasonably desirable or necessary to operate or maintain the System (and each and every part of the System);

11.1.2 rights to use any know-how disclosed or otherwise provided by Contractor (or any of its Subcontractors) (or any of its or their parent, subsidiary, sister or otherwise affiliated or related companies) as reasonably desirable or necessary to operate or maintain the System (and each and every part of the System); and

11.1.3 rights to use, copy, and modify (and create derivative works from) the System (and each and every part of the System), with no limitation on the number of sites or users, as reasonably desirable or necessary to operate or maintain the System (and each and every part of the System).

11.1.4 The Contractor's obligation to grant the license described in Section 11.1 will not apply with respect to Software for which District has entered into a direct license agreement with a Subcontractor.

## **11.2 Documentation and Materials**

Contractor further grants to District a perpetual, unlimited, royalty-free, non-exclusive and irrevocable license for District (including without limitation its officers, directors, employees, contractors, and agents) to use, copy, distribute, display publicly, perform, and modify (and create derivative works from) any and all written documentation, materials, or other works of authorship relating to the System, including without limitation user guides and training materials.

## **11.3 Third Party Software**

In providing the System, Contractor will use only that Third Party Software that has been expressly pre-approved in writing by the District. Contractor will procure, maintain, and otherwise be responsible for all licenses for the District, in the District's name, for any such Third Party Software reasonably necessary to operate or maintain the System – though the District retains sole ultimate authority on executing and entering into any such licenses. Contractor shall provide to the District copies of such licenses, along with any related software or license documentation. To the extent that any other licenses or permissions are reasonably desirable or necessary for the District to operate or maintain the System, Contractor hereby grants to the District to the maximum extent within its rights—or will procure for the District, in the District's name, to the maximum extent reasonably negotiable—any such licenses and permissions.

## **11.4 Right to Sublicense**

District may, in its sole discretion and without incurring any further or additional charge, sublicense any of its rights under this Agreement as reasonably necessary to operate or maintain the System for its intended purpose, including without limitation: to third-party vendors, contractors, or consultants whom District may retain to assist in operation or maintenance of the System.

## **11.5 Licenses Under Bankruptcy Code**

All rights and licenses granted under or pursuant to this Agreement are and shall be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of rights to “intellectual property,” as defined under Section 101 of the U.S. Bankruptcy Code. The Parties

agree that District, as a licensee of such rights under this Agreement, shall retain and may fully exercise all of its rights and elections under the U.S. Bankruptcy Code; however, nothing herein shall be deemed to constitute a present exercise of such rights and elections. Contractor hereby agrees and consents that, in the event of an order for relief under the United States Bankruptcy Code with respect to or otherwise affecting District, District will be permitted to assume this Agreement and all licenses set forth herein pursuant to Section 365 of the U.S. Bankruptcy Code, notwithstanding any right that Contractor may have pursuant to Section 365(c)(1) of the U.S. Bankruptcy Code to object to such assumption. This consent shall constitute an "irrevocable consent" pursuant to Section 365(c)(1)(B) of the U.S. Bankruptcy Code.

#### **11.6 Source Code and Escrow**

The District requires access to all source code to any System software it has licensed. If the Contractor does not provide the District the source code directly, then Contractor agrees that as a condition of Final Acceptance it will deposit, or ensure that a Subcontractor with whom District has directly licensed software has deposited (and provide verification of such deposit as set forth below), the source code for any Software comprising any part of otherwise used in the System (including all updates, versions, releases, and upgrades licensed under this Agreement, as well as any information and tools necessary to allow the escrow agent to verify that the deposited source code matches the Software currently in use by the District) (excluding COTS), into escrow with a source code agent capable of providing certification/verification that the deposited software matches the software currently in use by District in the System.

The initial deposit (or if not deposited into escrow, then direct provision to the District) shall be made promptly after Go-Live as a condition of Final Acceptance. Contractor shall update and maintain source code deposits as necessary—including any and all subsequent fixes, updates, revisions, versions, releases, and upgrades licensed under this Agreement—promptly after any applicable software is fixed, corrected, updated, upgraded, or otherwise modified such that source code in escrow is promptly updated to match the System configuration currently in use by District. All such subsequent deposits into escrow are subject to the same verification requirement set forth herein. Each new deposit will be kept and maintained separately by the escrow agent, with the earlier deposits kept and maintained separately in an archive.

The applicable source code will be released to District (or any contractor acting on its behalf) (a) in the event of nonperformance or the inability of Contractor to timely fulfill any of its obligations regarding the System under this Agreement or any applicable warranties under this Agreement; (b) in the event that Contractor is unable or unwilling to timely assist District with programming, bug-fix, maintenance, or other issues relating to the applicable software at reasonable market prices, even after expiration or termination of this Agreement; (c) in the event any petition of bankruptcy under the Federal Bankruptcy Code is filed by or against Contractor (or a Subcontractor whose Software is subject to this escrow requirement) which is not terminated, dismissed or discharged within sixty (60) days, and neither Contractor nor any successor or affiliated entity is available to work on a commercially reasonable basis to develop modifications or enhancements to the Software reasonably requested by District. In addition, any source code in escrow will be released to the District upon expiration of the fifth year of maintenance services, regardless of whether any of the above release conditions have been satisfied.



Contractor agrees that District (or any contractor acting on its behalf) may use the source code to maintain, fix, or modify the applicable Software as reasonably necessary to operate or maintain any portions of the System. Contractor (or a Subcontractor) and District will separately execute an escrow agreement setting forth the details of the escrow arrangement—though for clarity, to the extent they have not executed such an agreement, that will not relieve Contractor of its escrow obligations under this Section. District will be responsible for any costs related to the escrow through the term of this Agreement.

### **11.7 Precedence**

In the event of conflict between this Section 11 and any separate software, technology, patent, copyright, or other intellectual-property or proprietary-rights license, escrow, or otherwise related agreement, this Section shall take precedence.

## **12. CONFIDENTIALITY AND PUBLIC RECORDS ACT DISCLOSURE**

**12.1 Confidentiality.** Any District materials to which the Contractor or its Subcontractors has access or materials prepared by the Contractor during the course of this Agreement must be held in confidence by the Contractor, who must exercise all reasonable precautions to prevent the disclosure of information to anyone except the officers, employees and agents of the Contractor as necessary to accomplish the Work and who are bound by appropriate Non-Disclosure Agreements or appropriate clauses in such officers' or employees' employment documentation. Except with regard to District PII, which is subject to special provisions set forth in Section 13, this restriction on disclosure will not apply to information publicly known at the time of disclosure or information Contractor reasonably believes it is legally obligated to disclose by law, legal regulation, or court order, provided, however, that in such case, the Contractor must, unless compelled by a court order to disclose immediately, inform District prior to disclosure in time sufficient for District to take such legal action as it deems necessary or appropriate to prevent such disclosure or protect such information appropriate during such disclosure.

The Contractor must not release any reports, information or promotional materials prepared in connection with this Agreement, whether deemed confidential or not, without the approval of the District's General Manager, or designee.

The Contractor, its employees, Subcontractors, and agents may not refer to District, or use any logos, images, or photographs of District for any commercial purpose, including, but not limited to, advertising, promotion, or public relations, without District's prior written consent. Such written consent will not be required for the inclusion of District's name on a customer list. The Contractor must ensure that all published information is factual and that it does not in any way imply that District endorses Contractor's firm, service, or product.

If requested by District, Contractor will sign an agreed upon and negotiated information security and confidentiality agreement provided by District, and attest that its employees, representatives, agents, and subcontractors involved in the performance of this Agreement will be similarly bound by terms of a confidentiality agreement with the Contractor.

**12.2 Public Records Act Disclosure:** District will take reasonable precautions to keep Contractor's materials to which it has access, or materials prepared by the Contractor during the

course of this Agreement, in confidence to the extent allowed by law, and to the extent such confidentiality does not prevent District from fulfilling its role as the operator of the Golden Gate Bridge. Notwithstanding the previous sentence, the manuals, reports, records, and all other information and communication submitted by Contractor (referred to only for purposes of this section as a Writing) to District may be public records within the meaning of that term in the California Public Records Act, Government Code section 6250, et seq. Unless a particular Writing is exempted from disclosure by the California Public Records Act or is otherwise not legally required to be disclosed, it must be disclosed by District upon request. If Contractor believes any Writing, or portion thereof, contains trade secrets or other proprietary information that Contractor believes would cause substantial injury to Contractor's competitive position if disclosed, Contractor must, at the time the Writing is provided to District, request that District withhold from disclosure the proprietary information by conspicuously marking each page containing such proprietary information as confidential. If Contractor does not request that District withhold from disclosure a Writing, or portion thereof, by identifying it as confidential or proprietary, District will have no obligation to withhold the information from disclosure and may release the information sought without any liability to Contractor.

To the extent consistent with its obligations under the Public Records Act, District will provide reasonable notice to Contractor of any request for records under the Public Records Act that may result in the disclosure of any Writing that Contractor has marked confidential. If Contractor requests that District withhold from disclosure a Writing identified as confidential, and District complies with Contractor's request, Contractor assumes all responsibility for any challenges resulting from the non-disclosure, and will indemnify and hold harmless District from and against all claims and losses (including attorneys' fees) arising in connection with District's nondisclosure of the requested records. Contractor will not make a claim, sue, or maintain any legal action against District or its directors, officers, employees, or agents concerning the withholding from disclosure of Contractor's information. District will not, in any way, be liable or responsible for the disclosure of any trade secret including, without limitation, those records so marked, if disclosure is deemed to be required by law or by order of the Court.

### **13. DATA PRIVACY AND SECURITY**

**13.1 General Obligation Regarding District PII.** Contractor must ensure and maintain the confidentiality, security, safety, and integrity of all District PII, including physical, electronic, and procedural safeguards designed to prevent unauthorized access or use and protect against known or anticipated threats to the security or integrity of such data. This includes, but is not limited to, the secure transport, transmission and storage of District PII used or acquired in the performance of this Agreement. Notwithstanding the generality of the foregoing requirements, Contractor will adhere to the following requirements concerning District PII

13.1.1 Contractor may not, except as authorized or required by law, reveal or divulge to any person or entity any District PII that becomes known to it during the term of this Agreement. Contractor may not use or attempt to use any such information in any manner that may injure or cause loss, either directly or indirectly, to District.

13.1.2 Contractor must maintain policies and programs that prohibit unauthorized disclosure of District PII and promote training and awareness of information security policies and

practices. Contractor must comply, and must cause its employees, representatives, agents, and subcontractors to comply, with such commercially and operationally reasonable directions as District may make to promote the safeguarding or confidentiality of District PII;

13.1.3 Contractor must conduct background checks for employees or Subcontractors that have access to District PII or systems hosting District PII;

13.1.4 Contractor must limit access to computer and networks that host District PII, including without limitation through user credentials and strong passwords, data encryption at rest, firewall rules, and network-based intrusion detection systems;

13.1.5 Contractor agrees to properly secure and maintain any computer systems (hardware and software applications) or electronic media within its control that it will use in the performance of this Agreement. This includes ensuring all security patches, upgrades, and anti-virus updates are applied pursuant to the Contractor's policy to secure PII that may be used, transmitted, or stored on such systems in the performance of this Agreement.

13.1.6 The Contractor agrees to comply with the information handling, security, and confidentiality requirements outlined in the California Information Practices Act (Civil Code sections 1798 et. seq.) and is subject to the requirements of California Streets and Highways Code Section 31490 by entering into this Agreement with the District. In addition, Contractor warrants and certifies that in the performance of this Agreement, it will comply with all applicable statutes, rules, regulations and orders of the United States and the State of California relating to the handling and confidentiality of District PII, including the terms and conditions contained in this Section.

13.1.7 Contractor must have vulnerability management programs to identify and minimize threats and risks on any systems used to store or transmit District PII;

13.1.8 The Contractor represents that the Contractor's management access to the hosting infrastructure is limited to authorized support staff. The security architecture has been designed to control appropriate logical access to the infrastructure to meet industry standards that meet or exceed the Trust Services Criteria and Principles for Security, Availability, Integrity, and Confidentiality established by the AICPA.

13.1.9 Contractor must destroy deleted District PII stored on its computers in such a manner that it cannot later be restored. Notwithstanding anything to the contrary in this Agreement, the Contractor agrees to retain District PII for no longer than three days after the completion date of this Agreement and the District's confirmation that the Contractor may proceed with such deletion. At the conclusion of this retention period, the Contractor agrees to use U.S. Department of Defense ("DoD") –approved method and removal of District PII from any files stored on its computers, with said service being included in the total cost of this Agreement. Discarded District PII will be unavailable and unrecoverable following the purge on any storage media including, but not limited to, magnetic disk, optical disk, and memory chips ("Storage Media"). The Contractor agrees to destroy hard-copy documents containing District PII by means of a cross-cut shredding machine. The Contractor also agrees to use DoD—approved methods, or an alternate Client-approved method, to sanitize any Storage Media prior to discarding or when useful life has ended, whichever comes first. At the conclusion of the performance period of this

Agreement, the Contractor shall submit a certification to the District's Project Manager that all electronic or hard-copy format District PII has been destroyed in accordance with the Agreement.

13.1.10 Contractor must conduct due diligence on any third-party infrastructure and data security before outsourcing or using remote hosting or similar services that affect District PII;

13.1.11 Contractor, its employees, agents, Subcontractors, and consultants may not download or otherwise store any District PII onto any Contractor computer, desktop, laptop, thumb drives, disks, or other portable memory device without such data being encrypted.

13.1.12 District will be entitled to conduct reasonable audits of Contractor's data security procedures and measures, on reasonable notice.

13.1.13 This Section will survive termination or expiration of this Agreement.

## **13.2 Notice of Security Breach**

13.2.1 If Contractor has reason to believe that any District PII may have been accessed without proper authorization while in the possession or custody of Contractor (or any Subcontractor), Contractor must immediately take such actions as may be necessary to preserve forensic evidence and eliminate the cause of any suspected breach or security vulnerability—and must promptly alert District of any such circumstances, including information sufficient for District to assess the nature and scope of any suspected data breach. In addition, the Contractor must immediately notify the District when it discovers that there may have been a data security incident that has or may have resulted in compromise to District PII. For purposes of this Section, immediately is defined as within twenty-four hours of discovery. In the event of an unauthorized disclosure of District PII, the Contractor will be liable for paying for the following costs to remediate any such unauthorized disclosure:

13.2.1.1 The reasonable cost of providing notice of the breach to individuals affected by such breach;

13.2.1.2 The reasonable cost of providing required notice of the breach to government agencies, credit bureaus, and/or other required entities;

13.2.1.3 The cost of providing individuals affected by such breach with credit protection services designed to prevent fraud associated with identity theft crimes for a specific period not to exceed 12 months; and

13.2.1.4 Any other service required by applicable law.

13.2.2 The Contractor must provide any information and/or support to the District in issuing the actual notification and, at the District's sole discretion, the Contractor must itself provide actual notification if the District desires; and in such case, Contractor will consult with District regarding the appropriate steps for notifying such parties. This Section will survive termination or expiration of this Agreement.

#### **14. USE OF SUBCONTRACTORS**

The Contractor may not subcontract any services to be performed by it under this Agreement without the prior written approval of District, except for those service firms engaged in drawing, reprographics, typing, and printing. Upon request, Contractor will provide the District with copies of all agreements with Subcontractors. The Contractor will be solely responsible for reimbursing any Subcontractors and District will have no obligation to them. Without limitation to the generality of the foregoing, each such written subcontract will at a minimum contain the following express provisions:

- Contractor, not District, is solely responsible for payment to the Subcontractor for any amounts owing—and the Subcontractor will have no claim, and may take no action against District (or its officers, directors, employees or sureties) for nonpayment by Contractor.
- Subcontractor agrees that the subcontract is subservient to this Agreement and that it will be bound to the applicable terms and conditions of this Agreement.

Consent by District to subcontracting will not relieve the Contractor of its primary responsibility for performance under this Agreement. The Contractor must be responsible for all work, whether subcontracted or purchased from a supplier. The Contractor agrees to pay its Subcontractors all sums owed and will be solely responsible for reimbursing any Subcontractors; District will have no obligation to them.

#### **15. KEY PERSONNEL**

It is understood and agreed by the Parties that at all times during the term of this Agreement that Tony Marti will serve as the Project Manager of the Contractor and that the following Key Personnel and Support Staff identified in Contractor's proposal or as otherwise approved by District must undertake, render, and oversee all of the Work under this Agreement.

Deputy Project Manager: Lukas Grill

Gantry Coordinator: Craig Koudelka

RCSC Coordinator: Pavel Podniesinski

RCSC Advisor: Venkat Durgam

Maintenance Manager: Daniel Lafuente

Software Maintenance: Lisa Millihaven

Database Maintenance: Shruti Sheladia

Quality Manager: Robert Erwin

Test Manager: Carlos Aguilera

Solution Manager: Raymon Lange

Lane Architect: Sam Sparks

Host/Database: Dale Noel

Systems Engineer: Todd Hammond

Installation Manager: Kris Larsen

Scheduler: Rodney Gatlin

District awarded this Agreement to Contractor based on District's confidence and reliance on the expertise of Contractor's Key Personnel and Support Staff. Contractor may not reassign any Key Personnel (or Support Staff) or assign other personnel to Key Personnel (or Support Staff) roles until and unless District, in its sole discretion, approves a replacement in writing. District reserves the right to direct the removal of any personnel, including but not limited to Key Personnel or Support Staff, when in District's opinion the individual's performance is unsatisfactory. Replacement of Key Personnel or Support Staff does not excuse Contractor from compliance with all of the requirements of the Agreement, including any schedule.

## **16. COMPLIANCE WITH LAW**

Contractor must familiarize itself and perform all Work in conformity with the current and any successor requirements and standards of the District, including but not limited to those specifically applicable to the operation of Toll Systems set forth in the California Streets and Highways Code and the California Vehicle Code. Contractor must also comply with all applicable current and successor federal, California, and local laws and ordinances.

## **17. OCCUPATIONAL SAFETY AND HEALTH**

It is a covenant and condition of this Agreement, and will be made a covenant and condition of each subcontract entered into pursuant to this Agreement, that the Contractor and any Subcontractor may not require any laborer or mechanic employed in performance of the Agreement to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his or her health as defined by applicable safety and health standards.

The Contractor and all personnel must comply with OSHA regulations applicable to Contractor regarding necessary safety equipment or procedures. All Contractor and Subcontractor personnel working on District property must also be required, as a contractual condition, to comply with District rules and procedures and any safety directive issued by District, or which may be in effect for that location as deemed necessary by District. The Contractor will be responsible for the knowledge and behavior of the Contractor and Subcontractor personnel in this regard.

## **18. CHANGES**

District may, at any time, by written order, make changes within the SOW and services described in this Agreement. If such changes cause an increase in the budgeted cost of or the time

required for performance of the agreed upon work, an equitable adjustment as mutually agreed will be made in the limit on compensation as set forth in Section 6 or in the time of required performance as set forth in Section 5, or both. In the event that the Contractor encounters any unanticipated conditions or contingencies that may affect the SOW or services, schedule, or the amount of compensation specified herein, the Contractor must so advise District immediately upon notice of such condition or contingency. The written notice must explain the circumstances giving rise to the unforeseen condition or contingency and must set forth the proposed adjustment in schedule or compensation. This notice must be given to District prior to the time that the Contractor performs work or services related to any proposed adjustment. The pertinent changes will be expressed in a written Amendment to this Agreement prior to implementation of such changes.

## **19. RISK OF LOSS**

### **19.1 Risk of Damage or Loss to the System**

At all times during this Agreement, including when any equipment is in transit to District, Contractor will bear all risk of damage or loss to all materials, equipment and property required for the implementation and maintenance of the System, including any equipment located at Contractor's facility for any reason, and the risk of all non-material damage or loss, except for damage and loss District agrees was caused by, and to the extent was caused by, the active negligence of District. In the case of damage or loss to equipment that District agrees was caused by the active negligence of District, Contractor must promptly replace the damaged or lost portions of the System at Contractor's cost, and submit the amount(s) thus expended to District for reimbursement as a clearly identified, separate item on its next invoice to District. In the event that Contractor fails to maintain the insurance required in Section 21, Contractor will be responsible for paying any and all amounts that would have been covered by such insurance. With regard to the cost of any such damage or loss not recovered under Contractor's insurance, the cost of rebuilding, repairing, restoring and/or replacing the damaged or lost portions of the System is deemed included in the lump sum amount set forth in Section 6.

### **19.2 Risk of Loss to Other Property in Performing the Work**

Contractor bears the risk of loss or damage to any property not considered part of the System arising from actions or inactions of Contractor. In addition, Contractor bears all risk of loss with respect to all materials acquired for the purpose of implementing and maintaining the System. The foregoing applies to any property of Contractor, Subcontractors, workers, and others performing the work, as well as third parties. Contractor must protect from damage existing property belonging to District or any third parties affected by its System design, testing, installation, operation, and support activities and must provide appropriate protection for all such property during progression of the Work. Should any District or third party property be damaged, such property must be repaired or replaced at Contractor's expense to the satisfaction of District, and if applicable, to the satisfaction of the affected third party. No extension of time will be allowed for repair or replacement of such damaged items. Should Contractor not repair or replace such damaged items, District will have the right to take corrective measures itself and deduct the cost from any sums owed to the Contractor.

## **20. RESPONSIBILITY; INDEMNIFICATION**

**20.1** The Contractor must, to the fullest extent permitted by law, indemnify, keep and save harmless District, its directors, officers, managers, employees, representatives, and agents (collectively “Indemnitees”), against:

20.1.1 any and all suits, claims, actions, liabilities, losses, damages or expenses (including reasonable attorneys' fees and related costs, whether or not litigation has commenced) arising out of any injury to persons or property caused by, resulting from, relating to, or claimed to have been caused by, resulted from or related to (i) the negligent acts or omission of the Contractor (including its Subcontractors and suppliers), or (ii) the negligent or defective design, installation or maintenance of the System by the Contractor (including its Subcontractors and suppliers).

20.1.2 any and all suits, claims, actions, liabilities, losses, damages or expenses (including attorneys' fees and related costs, whether or not litigation has commenced), whether direct or indirect, arising out of, relating to, or in connection with any claim or allegation that the ownership, possession, maintenance, modification, or any other use of the System (or any software, hardware, or other component thereof) or any other deliverable or work performed by Contractor under this Agreement infringe or violate the patent, copyright, trade-secret, or other intellectual-property or proprietary rights of any third party—and in the event any such claims result in a finding of infringement or other violation, Contractor, at Contractor’s sole cost and expense, must: (a) secure for the District the right to continue using the materials, equipment, devices or processes by suspension of the injunction or by procuring a royalty-free license, or licenses, (b) replace any software, hardware, materials, equipment, devices, or processes found to be infringing or violative of third-party rights with non-infringing software, hardware, materials, equipment, devices, or processes, or (c) modify them so that they become non-infringing; and the alternative of (a), (b), or (c) must be selected in consultation with District and with District’s written consent, which will not be unreasonably withheld, though in any event the selection may not entail an unreasonable or excessive amount of time or cause undue disruption to District’s operations; and

20.1.3 any and all suits, claims, actions, liabilities, losses, damages or expenses (including attorneys' fees and related costs, whether or not litigation has commenced), whether direct or indirect, to the extent arising out of, relating to, or in connection with any third party claim or allegation that Contractor breached its representations or obligations relating to data privacy and security, including any disclosure of District PII, set forth in this Agreement.

**20.2** With regard to the indemnity obligations contained in Section 20.1, the Contractor further agrees to control and defend any and all such actions, suits, or claims (subject to District’s right to have separate, independent counsel in the event of a conflict between Contractor and District) and pay reasonable charges of attorneys and other costs and expenses incurred by District, as they are incurred and come due. If any judgment is rendered against the Indemnitees, Contractor must, at its expense, satisfy and discharge the same.



**20.3** Contractor is not obligated to indemnify District for suits, claims, or actions arising out of any injury to persons or property caused by the sole negligence of District or parties within its control, or its willful misconduct, or criminal acts.

**20.4** In the case of a negotiated settlement of any claim arising out of any injury to persons or property, Contractor's duty to indemnify will extend only to that portion of any such settlement determined by the agreement of Contractor and District to have been attributable to the probability that Contractor would have been obligated to provide an indemnity pursuant to this Section.

**20.5** This indemnification will survive termination or expiration of the Agreement.

**20.6** Except for costs incurred pursuant to its indemnity obligation set forth in this section, Contractor's total liability for all claims, losses, or damages arising out of Contractor's performance during the implementation phase prior to Go Live will not exceed the amount the District will pay under Section 6.1 for all Work up to and including Final Acceptance.

**20.7** Except for costs incurred pursuant to its indemnity obligation set forth in this section, Contractor's total liability for all claims, losses or damages arising out of Contractor's performance during the maintenance phase—i.e., after Go Live, will not exceed \$7,000,000.

**20.8** NEITHER PARTY SHALL BE LIABLE FOR INDIRECT, CONSEQUENTIAL, EXEMPLARY OR PUNITIVE DAMAGES, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, OR OTHERWISE, AND EVEN IF IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NOTHING IN THIS SECTION IS INTENDED TO WAIVE CONTRACTOR'S RESPONSIBILITY FOR THE PERFORMANCE ASSESSMENTS SET FORTH IN SECTION 6.4.

## **21. INSURANCE REQUIREMENTS**

### **A. Types of Insurance**

The Contractor shall not commence work until proper evidence of insurance coverage of the types and amounts specified in this section has been provided to the District. The Contractor shall not violate or permit to be violated any conditions or provisions of said policies of insurance, and at all times shall satisfy the requirements of the insurer for the purpose of maintaining said insurance in effect.

If any claim is made by any third person against the Contractor on account of any incident connected to the Agreement, the Contractor shall promptly report the fact in writing to the District, giving full details of the claim.

Any person, firm, or corporation that the Contractor authorizes to work upon the District's property, including any subcontractor, shall be deemed to be the Contractor's agent and shall be subject to all applicable terms of this Agreement. Prior to the Contractor's start of the work or entry onto the District's property, the Contractor agrees to require its subcontractors to procure and maintain, at the

Contractor's (or its subcontractor(s)') sole cost and expense (and to prove to the District's reasonable satisfaction that it remains in effect throughout the performance of the work under this Agreement), the kinds of insurance described below. Such insurance must remain in effect throughout the term of this Agreement and will be at the sole cost and expense of the Contractor (or its subcontractor(s)).

1) Commercial General Liability Insurance

The Contractor shall, at its own expense, procure and maintain Commercial General Liability insurance providing bodily injury and property damage coverage with a combined limit of at least Five Million Dollars (\$5,000,000) each occurrence and a general aggregate limit of at least Ten Million Dollars (\$10,000,000). This insurance shall include, but not be limited to, premises and operations, contractual liability covering the indemnity provisions contained in this Agreement, personal injury, products and completed operations, and broad form property damage, and include a Cross Liability endorsement.

Said Policy shall protect the Contractor and the District in the same manner as though a separate policy had been issued to each, but nothing in said policy shall operate to increase the insurance company's liability as set forth in its policy beyond the amount or amounts shown or to which the insurance company would have been liable if only one interest had been named as an insured.

2) Business Automobile Liability

The Contractor shall, at its own cost and expense, procure and maintain Business Automobile Liability insurance providing bodily injury and property damage with a combined single limit of at least One Million Dollars (\$1,000,000) per occurrence for all owned, non-owned and hired automobiles. This insurance shall provide contractual liability covering all motor vehicles and mobile equipment to the extent coverage may be excluded from general liability insurance.

3) Workers' Compensation and Employers' Liability Insurance

If the Contractor employs any person to perform work in connection with this Agreement, the Contractor shall procure and maintain at all times during the performance of such work Workers' Compensation Insurance in conformance with the laws of the State of California, and federal laws where applicable. Employers' Liability Insurance shall not be less than One Million Dollars (\$1,000,000) for each accident and One Million Dollars (\$1,000,000) for each disease, with a policy limit of One Million Dollars (\$1,000,000).

The policy shall contain a waiver of subrogation in favor of the District and its officers, directors, employees, volunteers, and agents, while acting in such capacity, and their successors and assignees, as they now or as they may hereafter be constituted, singly, jointly, or severally.

4) Professional Liability Insurance

The Contractor shall also maintain Professional Liability Insurance covering the Contractor’s performance under this Agreement with a limit of liability of Five Million Dollars (\$5,000,000) for any one claim. This insurance shall be applicable to claims arising from the work performed under this Agreement. Prior to commencing work under this Agreement, the Contractor shall furnish to the District a Certificate of Insurance or certified copy of the insurance policy if requested, indicating compliance with the requirements of this paragraph. This certificate or policy shall further stipulate that thirty (30) days’ advance written notice of cancellation, non-renewal or reduction in limits shall be given to the District.

5) Cyber Liability Insurance

Such policy shall contain Cyber Liability risk coverages including network and internet security liability coverage, privacy liability coverage and media coverage.

The policy shall provide coverage for all work performed by the Contractor and any work performed or conducted by any subcontractor/consultant working for or performing services on behalf of the Contractor. No contract or agreement between the Contractor and any subcontractor/consultant shall relieve the Contractor of the responsibility for providing this Errors & Omissions or Professional Liability and Cyber Liability coverage for all work performed by the Contractor and any subcontractor/consultant working on behalf of the Contractor on the project.

Minimum Coverage and Minimum Limits:

\$1,000,000	Per Claim and Policy Aggregate
\$1,000,000	Errors and Omissions and Professional Liability
\$1,000,000	Cyber Liability including Privacy, Confidentiality and Network Security liability
\$1,000,000	Cyber Extortion
\$1,000,000	Regulatory Defense, Awards and Fines

**B. General Insurance Requirements**

1) Acceptable Insurance

All policies will be issued by insurers acceptable to the District. This insurance shall be issued by an insurance company or companies authorized to do business in the State of California with minimum "Best's" rating of B+ and with minimum policyholder surplus of Twenty-Five Million Dollars (\$25,000,000) or a company acceptable to the District in its sole discretion. All policies shall be issued in a form satisfactory to the General Manager of the District and shall be issued specifically as primary insurance. Workers' Compensation coverage requirements may be met with the California State Compensation Fund.

2) Procure and Maintain Insurance

The Contractor must, at its own cost and expense, procure and maintain at all times during the performance of this Agreement, all of the required policies specified above. The failure to procure or maintain the required insurance policies and/or an adequately funded self-insurance program acceptable to the District will constitute a material breach of the Agreement.

3) Terms of Policies

All insurance specified above shall remain in force until all work to be performed is satisfactorily completed. If the insurance is provided on a claims-made basis, it must remain in force for the entire term of the Agreement and a minimum of three (3) years thereafter.

4) Self-Insurance

Upon evidence of financial capacity satisfactory to the District and Contractor's agreement to waive subrogation against the District respecting any and all claims that may arise, the Contractor's obligations hereunder may be satisfied in whole or in part by adequately funded self-insurance.

5) Deductibles and Retentions

The Contractor shall be responsible for payment of any deductible or retention on the Contractor's policies without right of contribution from the District. Deductible and retention provisions shall not contain any restrictions as to how or by whom the deductible or retention is paid. Any deductible or retention provision limiting payment to the Named Insured is unacceptable.

In the event that the policy of the Contractor or any subcontractor contains a deductible or self-insured retention, and in the event that the District seeks coverage under such policy as an additional insured, the Contractor shall satisfy such deductible or self-insured retention to the extent of loss covered by such policy for a lawsuit arising from or connected with any alleged act or omission of the Contractor, subcontractor, or any of their officers, directors, employees, agents, or suppliers, even if the Contractor or subcontractor is not a named defendant in the lawsuit.

**C. Evidence of Insurance and Endorsements**

Prior to commencing work or entering onto the District's property, the Contractor shall file a Certificate of Insurance with the District evidencing the foregoing coverages, including the following endorsements:

- 1) The insurance company(ies) issuing such policy(ies) will provide at least thirty (30) days' notice to the District of cancellation or non-renewal.
- 2) That the policy(ies) is primary insurance and the insurance company(ies) providing such policy(ies) shall be liable thereunder for the full amount of any loss or claim that the Contractor is liable for under this section, up to and including the total limit of liability, without right of contribution from any other insurance maintained or which may be maintained by the District.
- 3) Such insurance shall include as additional insureds the District, and its respective directors, officers, employees, and agents while acting in such capacity, and their successors or assignees, as they now or as they may hereafter be constituted, singly, jointly, or severally.
- 4) The policy must also contain either a Cross Liability endorsement or Severability of Interests Clause and stipulate that inclusion of the District as an additional insured will not in any way affect the District's rights as respects to any claim, demand, suit or judgment made, brought, or recovered against the Contractor. Said policy shall protect the Contractor and the District in the same manner as though a separate policy had been issued to each, but nothing in said policy shall operate to increase the insurance company's liability as set forth in its policy beyond the amount or amounts shown or to which the insurance company would have been liable if only one interest had been named as an insured.

**D. Consequence of Lapse**

Should any required insurance not be procured or lapse during the term of this Agreement, requests for payment originating after such lapse will not be processed until the District receives satisfactory evidence of reinstated coverage as required by the Agreement. If insurance is not reinstated, the District, may, at its sole option, terminate this Agreement effective on the date of such lapse of insurance.

**22. AGREEMENT BONDS**

**22.1 Performance Bond**

The Contractor must provide a Performance Bond in an amount of not less than 100% of the System price indicated on Contractor's Cost Proposal Form. The Performance Bond must guarantee the Contractor's faithful performance of the Agreement in compliance with all terms, conditions and requirements specified in the Agreement. It must also guarantee any excess payments District may make in order to complete the work in the event of Contractor's default. The Performance Bond must remain in full force and effect until Final Acceptance.

Upon Final Acceptance, the District will agree to reduce the amount of the Performance Bond such that the Performance Bond will be in the amount of the Contractor's price for the third year of Maintenance Services. This reduced bond must remain in effect for the duration of the term of the Agreement, including all option terms if exercised by the District. The Performance Bond must be issued by a surety company (1) approved by District; and (2) holding a valid certificate as an admitted surety authorized to transact surety business in California. The Performance Bond must be on the form approved by District and included as Attachment H.

**23. CONTRACTOR'S STATUS**

Neither the Contractor nor any party contracting with the Contractor is an agent or employee of District. The Contractor is and will be an independent Contractor, and the legal relationship of any person performing services for the Contractor will be one solely between that person and the Contractor.

**24. ASSIGNMENT**

The Contractor may not assign any of its rights nor transfer any of its obligations under this Agreement without the prior written consent of District.

**25. DISTRICT REPRESENTATIVE**

Except when approval or other action is required to be given or taken by District's Board of Directors, the District's General Manager, or such person or persons as he will designate in writing from time-to-time, will represent and act for District.

**26. N.A.**

**27. CLAIMS OR DISPUTES**

The Contractor will be solely responsible for providing timely written notice to District of any claims for additional compensation and/or time in accordance with the provisions of this Agreement. It is District's intent to investigate and attempt to resolve any Contractor claims before the Contractor has performed any disputed work. Therefore, Contractor's failure to provide timely notice will constitute a waiver of Contractor's claims for additional compensation and/or time.

Claims by the Contractor disputing any interpretation of the meaning and intent of this Agreement by District or arising from performance of this Agreement must be referred in writing to District's Project Manager for a written decision. Except for claims that result from a disagreement over a proposed Amendment issued pursuant to Section 18, all such claims must be filed within 10 days after Contractor knows, or should have known, of the issues giving rise to the claim, and must be accompanied by written documentation substantiating the reasons for which the Contractor believes additional compensation may be due, the nature of the costs involved, and the amount of the potential claim. Claims resulting from a disagreement over a proposed Amendment pursuant to Section 18 must be filed within ten 10 calendar days of the documented failure to resolve any disagreement. District's Project Manager will respond to the Contractor in writing with a decision within thirty (30) calendar days following receipt of the Contractor's claim. District may, in its discretion, extend the time for its response if necessary, or may request, in writing, within thirty (30) calendar days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims District may have against the Contractor.

If there is a dispute over any claim, the Contractor must continue to work during the dispute resolution process in a diligent and timely manner as directed by District, and will be governed by all applicable provisions of the Agreement. The Contractor must maintain cost records of all work which is the basis of any dispute.

All disputes will use the following escalation procedures:

Contractor and District will use good faith efforts to resolve all disputes informally at the Project Manager level. In the event such efforts are unsuccessful, either Party may request that District provide a written determination as to the proposed resolution of the dispute.

Within thirty (30) calendar days of the request, the Project Manager will provide a written determination as to the dispute, which will include the basis for its decision. Upon Contractor's written acceptance of the Project Manager's determination, the Agreement may be modified and the determination implemented or, failing agreement, District may in its sole discretion pay such amounts and/or revise the time for performance in accordance with the Project Manager's determination.

If the Project Manager's determination is not accepted by the Contractor, or if the Project Manager fails to respond within 30 days, the matter will promptly be referred to senior executives of the Parties having designated authority to settle the dispute. The senior executives will exchange memoranda stating the issues in dispute and their respective positions and then meet for negotiations at a mutually agreed time and place. At either Party's request, such meeting will take place within 30 calendar days of the referral of the claim to senior management pursuant to this paragraph. If the matter has not been resolved within thirty (30) calendar days of commencement of senior management negotiations, the Parties may mutually agree to try to settle the dispute by means of alternate dispute resolution methodologies such as mediation or arbitration.

In the event that efforts to resolve disputes under this Section are unsuccessful, Contractor must file a government claim, pursuant to California Government Code Section 910 et seq., in order to initiate a civil action.

## **28. TEMPORARY SUSPENSION OF WORK**

District, in its sole discretion, reserves the right to stop or suspend all or any portion of the work for such period as District may deem necessary. The suspension may be due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the Agreement, or to factors that are not the responsibility of the Contractor, including temporary non-appropriation of funds. The Contractor must comply immediately with the written order of District to suspend the work wholly or in part. The suspended work must be resumed when the Contractor is provided with written direction from District to resume the work. In the event of a suspension of the work, the Contractor must take all necessary steps to minimize the incurrence of costs allocable to work stopped. Contractor will not be relieved of the Contractor's responsibilities under this Agreement, except the obligations to perform the work which District has specifically directed Contractor to suspend under this Section.

If the suspension is due to the Contractor's failure to perform work or carry out its responsibilities in accordance with this Agreement, District may suspend performance for up to one hundred and eighty (180) calendar days and all costs will be at Contractor's expense and no schedule extensions will be provided by District.

If the suspension is not due to the Contractor's failure to perform work or carry out its responsibilities in accordance with this Agreement, for example due to temporary non-appropriation of funds, District may suspend performance for up to three hundred and sixty five (365) days. If the suspension is not caused by failure on the part of the Contractor to perform any provision of the Agreement, Contractor will be entitled to reasonable compensation and/or schedule extensions upon a showing that Contractor has incurred costs or expenses, or is reasonably entitled to a schedule extension, as a result of the suspension. The Parties will meet and confer and will make best efforts to agree to all terms governing a resumption of work within 90 days of direction from District to resume work. If the Parties cannot agree to the terms governing a resumption of work within 90 days, District may in the reasonable exercise of its discretion make a determination as to the terms governing a resumption of work, and Contractor, if it disagrees, may avail itself of the claims procedures set forth in Section 26.

## **29. TERMINATION**

District will have the right to terminate this Agreement in whole or in part at any time by giving written notice to the Contractor. Upon receipt of such notice, the Contractor must not commit itself to any further expenditure of time or resources.

### **29.1 Termination for Convenience**

District may terminate this Agreement for District's convenience, including for non-appropriation of funds, at any time by giving Contractor a minimum of 60 calendar days' written notice of District's election to terminate. District may also terminate the Agreement, without sixty days' notice, upon a failure to agree to the terms of a resumption of work pursuant to Section 27. Upon receipt of such notice, Contractor must immediately take action not to incur any additional obligation, cost or expense, except as may be reasonably necessary to terminate its activities.



In the event of termination for convenience, District will pay Contractor for all work performed through the effective date of termination, based on the percentage of work completed and the Agreement price for such work, as well as those reasonable and necessary costs incurred by Contractor to effect such termination, including those costs incurred as a result of any suspension of work that preceded a termination for convenience. Contractor will not be entitled to any payment for lost profit on work to be performed after the date of termination. All finished or unfinished documents and any materials procured for or produced pursuant to this Agreement will become the property of District upon the effective date of such termination for convenience.

In the event of termination for convenience, Contractor, and its Subcontractors, will provide reasonable and good faith cooperation in any transition to other vendors or consultants as District may determine necessary. Failure to so cooperate is a breach of the Agreement and grounds for a treating a termination for convenience instead as a termination for default.

## **29.2 Termination for Default of Agreement**

If Contractor fails to perform any material provisions of this Agreement, District may find Contractor to be in partial or complete breach. If Contractor does not cure such breach within thirty (30) calendar days after receipt of written notification that such failure has occurred, or provide a plan to cure such breach which is acceptable to District within the time specified by District, then District may, in its discretion, terminate this Agreement, in whole or in part, on the basis of Contractor's default of this Agreement. In the event of the filing a petition for bankruptcy by or against the Contractor or for appointment of a receiver for Contractor's property, District may terminate this Agreement immediately without the thirty day cure period. If the Agreement is terminated for default, District will remit final payment to the Contractor in an amount to cover only those services performed, and expenses incurred in full accordance with the terms and conditions of this Agreement up to the effective date of termination.

The term "breach" for purposes of this Section includes, but is not limited to, the performance of the work in violation of the terms of the Agreement; abandonment, assignment or subletting of the Agreement without approval of District; filing a petition for bankruptcy by or against the Contractor or for appointment of a receiver for Contractor's property; failure of the Contractor to perform its obligations under the Agreement (including but not limited to: use of materials, supplies, or equipment of quality or quantity below the requirements in the Agreement; failure to use an adequate number of properly skilled workers; failure to provide required Key Personnel; failure to provide proper workmanship); failure to perform its obligations under the Agreement within the time specified therein; failure to take effective steps to end a prolonged labor dispute; or the performance of the Agreement in bad faith.

Upon District's termination of the Agreement or a portion thereof for default, District will have the right to complete the work or the portion terminated by whatever means and methods it deems expedient, including the hiring of others on such terms as District deems advisable. The expense of completing such work or portion thereof will be charged to the Contractor. Contractor must pay District the amount due for such expense, or the amount owed may be deducted by District out of such monies as may be due or become due to the Contractor. District may withhold all or any part of any payments otherwise due the Contractor until completion and final settlement of the work covered by such notice of default. If the Contractor

cures the default within the cure period, but subsequently defaults again, District may immediately terminate the Agreement or a portion of it without giving the Contractor any further notice or a right to cure.

All finished or unfinished documents and any equipment procured for or produced pursuant to this Agreement becomes the property of District upon the effective date of such termination for default. In addition, Contractor agrees to assign to the District, at the District's request, any Subcontractor agreements, including but not limited to software license and maintenance and support agreements.

The rights and remedies of District provided in this Section are not exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

### **30. TRANSITION**

Leading up to and upon any expiration or termination of this Agreement, the Parties will cooperate in good faith for smooth and efficient transitions. Without limitation to the generality of the foregoing, Contractor will provide District with copies of all data in the possession, custody, or control of Contractor (or any Subcontractors) and reasonable assistance with ensuring that such data is readable and usable by District. Additionally, at District's request, for up to 90 days after any expiration or termination of this Agreement, Contractor will provide reasonable transition assistance; and for any such services outside the scope of this Agreement, Contractor may charge its then-prevailing rates for such services, but no more than the rates it charges to other customers for similar or comparable services and no more than reasonable rates.

### **31. LIQUIDATED DAMAGES**

#### **31.1 Liquidated Damages During Implementation**

It is agreed by the Parties to this Agreement that time is of the essence, and in the event of a delay in completing specified milestones beyond required dates set forth in the Project Schedule, subject to District -authorized extensions, damage will be sustained by the District, and that it is or will be impracticable to determine the actual amount of the damage by reason of such delay. It is, therefore, agreed as follows:

31.1.1 Milestone 1.3, Gantry Requirements Plan. The District may assess liquidated damages of \$1,000 per calendar day for every calendar day, or part of day, for up to 10 days of delay, later than the submission date for the Gantry Requirements Plan documented in the Project Schedule that Contractor is late in securing District approval of that deliverable required to be submitted by SOW Section 2.2.1.6. If Contractor is late more than 10 days, the liquidated damages increase to \$5,000 per calendar day for every calendar day, or part of day, starting on the 11<sup>th</sup> day until the 30th day and increase further to \$10,000 per calendar day for every calendar day, or part of day starting on the 30th day until approval is secured from the District.

31.1.2 Milestone 2.1, Preliminary Design Approval. The District may assess liquidated damages of \$1,000 per calendar day for every calendar day, or part of day, for up to 10 days of delay, later than the submission date for the Preliminary System Design Document documented in the Project Schedule that Contractor is late in securing District approval of the that

deliverable in accordance with SOW Section 10. 1. If Contractor is late more than 10 days, the liquidated damages increase to \$5,000 per calendar day for every calendar day, or part of day, starting on the 11<sup>th</sup> day until the 30th day and increase further to \$10,000 per calendar day for every calendar day, or part of day starting on the 30th day until approval is secured from the District.

31.1.3 Milestone 2.3, Final Design Approval. The District may assess liquidated damages of \$1,000 per calendar day for every calendar day, or part of day, for up to 10 days of delay, later than submission date for the Final System Design Document documented in the Project Schedule that Contractor is late in securing District approval of that deliverable in accordance with SOW Section 10.1. If Contractor is late more than 10 days, the liquidated damages increase to \$5,000 per calendar day for every calendar day, or part of day, starting on the 11<sup>th</sup> day until the 30th day and increase further to \$10,000 per calendar day for every calendar day, or part of day starting on the 30th day until approval is secured from the District.

31.1.4 Milestone 3.3, Factory Acceptance Test. The District may assess liquidated damages of \$1,000 per calendar day for every calendar day, or part of day, for up to 10 days of delay, greater than six weeks from commencement of the Factory Acceptance Test or other date upon mutual agreement that Contractor is unable to successfully complete the Factory Acceptance Test in compliance with the requirements of SOW Section 10.3.1, as measured by District acceptance of the FAT test report. If Contractor is late more than 10 days, the liquidated damages increase to \$5,000 per calendar day for every calendar day, or part of day, starting on the 11<sup>th</sup> day until the 30th day and increase further to \$10,000 per calendar day for every calendar day, or part of day starting on the 30th day until the FAT test report is accepted by the District.

31.1.5 All Liquidated Damages during Implementation. The Liquidated Damages set forth in this Section 31 are independent and cumulative. In other words, if the Contractor is late in meeting one Milestone, it is expected to recover time or face Liquidated Damages for delay in meeting a second milestone. If the Contractor has not met a first milestone by the date specified for meeting a second milestone, the District may continue to assess Liquidated Damages for the first milestone while at the same time beginning to assess Liquidated Damages for delays in meeting the second milestone. This is in recognition of the critical time sensitivity of the Project Schedule and of the fact that the District is at risk for different actual damages for failures to meet different milestones; assessment of only one Liquidated Damages is insufficient to approximate the District's actual damages resulting from delay in multiple milestones.

The District may deduct, at its option, the amount of liquidated damages from any money due or to become due to the Contractor under this Agreement, or if such monies due are insufficient, the Contractor or its Surety(ies) must pay to District any deficiency in monies within 30 days of demand therefor by District.

The Contractor will be granted an extension of time and will not be assessed with liquidated damages for any delay beyond the time period specified above, for delays caused by acts of God or of the public enemy, fire, floods, epidemics, quarantine, restrictions, strikes, labor disputes, shortage of materials and freight embargoes, or other causes deemed by the District to be beyond the reasonable control of the Contractor, provided Contractor notifies the District's Project Manager in writing of the causes of delay within five calendar days from the beginning of any

such delay. The District's Project Manager will ascertain the nature of the delay and determine whether an extension of time is warranted, which determination will be final and conclusive. Contractor has the burden of proof that the delay was beyond its control.

Because of the need for work under this Agreement to be coordinated with the design and construction of the gantry, the Parties agree that the District will not assess Liquidated Damages for Contractor's delay in meeting the deadlines set forth in this Section 31 if such delays are caused by the performance of work relating to design and construction of the gantry and not caused by the Contractor. The parties also agree that Contractor will not be entitled to additional payment for any delays to the implementation work under this Agreement caused by the delayed performance of work relating to the design and construction of the gantry.

In the event that Contractor believes it will be unable to meet the dates scheduled for completion of a specified milestone subject to Liquidated Damages, 60 days prior to such milestone, the Contractor must notify District in writing of the delay and must request a meeting with District. Such notification must set forth the cause(s) of the delay and measures and actions the Contractor is taking to remedy or minimize the delay, which may include, at Contractor's sole expense, the engagement of a third party service provider to assist Contractor in meeting the milestone. Such third party service provider must be approved by District. Contractor must also propose a revised Implementation Plan to District for the District's approval.

District will stop assessing liquidated damages on either the date of Agreement termination or the date District and Contractor establish a revised Project Schedule. In the event that the Contractor fails to meet the revised dates set forth in the revised Project Schedule, District will once again begin assessing liquidated damages as set forth above. In the event the Agreement is terminated for cause, District will be entitled to recover its actual damages resulting from delays and will not be limited to the liquidated damages set forth in this section.

### **31.2 Liquidated Damages During the Maintenance Period**

Beginning upon Go-Live the Contractor must respond to System alarms and District Service Requests in the time period ("Response Times") set forth in SOW Section 11.1.6. The specific Response Times vary depending on the severity of the alarm and the priority of the problem. It is agreed by the Parties to this Agreement that Contractor's delay in meeting the Response Time requirements will result in damage to the District, and that it is or will be impracticable to determine the actual amount of the damage by reason of such delay. It is, therefore, agreed that District may assess liquidated damages of \$100 for every 30 minutes later than the required Response Time Contractor actually responds to an alarm or a service request. District may deduct, at its option, the amount of liquidated damages from any money due or to become due to the Contractor under this Agreement, or if such monies due are insufficient, the Contractor or its Surety(ies) must pay to District any deficiency in monies within 30 days of demand therefor by District.

In no event shall the foregoing amounts assessed pursuant to this Section 31.2 in any given month exceed the monthly payment amount described in the payment schedule for that particular month.

### **32. MAINTENANCE, AUDIT AND INSPECTION OF RECORDS**

The Contractor must permit the authorized representatives of District, the Comptroller General of the United States and the State of California, including the Department of General Services, the Bureau of State Audits, to inspect, audit, make copies and transcriptions of books and all data and records of the Contractor relating to its performance under the Agreement. The Contractor must maintain adequate documentation to verify all services and expenses invoiced for payment under this Agreement and must allow interviews of any employees who might reasonably have information related to such records. The Contractor must maintain all such records for a period of three years after District makes final payment under this Agreement.

Any dispute regarding a question of fact arising under an audit of this Agreement that is not disposed of by agreement will be reviewed by District's Auditor Controller. Not later than 30 days after issuance of a final audit report, the Contractor may request a review of any unresolved audit issues. Neither the pendency of a dispute nor its consideration by District will excuse the Contractor from full and timely performance of its obligations under this Agreement.

### **33. EQUAL EMPLOYMENT OPPORTUNITY**

In connection with the performance of this Agreement, the Contractor may not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, sex, gender, sexual orientation, age (over 40), marital status, pregnancy, medical condition, or disability as specified in federal, State, and local laws. The Contractor will take affirmative actions to ensure that applicants are employed, and that employees are treated during their employment, without regard to the above factors. Such actions must include, but not be limited to, the following: employment, upgrading, demotion or transfer recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor shall comply with Executive Order 11246, entitled "Equal Employment Opportunity," as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60). The Contractor further agrees to insert a similar provision in all subcontracts, except subcontracts for standard commercial supplies or raw materials.

**33.1 Non-Discrimination.** During the performance of this Agreement, Contractor and its officers, employees, agents, representatives or subcontractors shall not unlawfully discriminate in violation of any federal, state or local law, rule or regulation against any employee, applicant for employment or person receiving services under this Agreement because of race, religion, color, national origin, ancestry, physical or mental disability, medical condition (including genetic characteristics), marital status, age, political affiliation, sex or sexual orientation. Contractor and its officers, employees, agents, representatives or subcontractors shall comply with all applicable Federal, State and local laws and regulations related to non-discrimination and equal opportunity, including without limitation the County's nondiscrimination policy; the Fair Employment and Housing Act (Government Code sections 12900 et seq.); California Labor Code sections 1101, 1102 and 1102.1; the Federal Civil Rights Act of 1964 (P.L. 88-352), as amended; and all applicable regulations promulgated in the California Code of Regulations or the Code of Federal Regulations.

**34. NON-DISCRIMINATION ASSURANCE**

The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of U.S. DOT-assisted contracts. Further, the Contractor agrees to comply with all provisions prohibiting discrimination on the basis of race, color, or national origin of Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. §§ 2000d *et seq.*, and with U.S. DOT regulations, "Nondiscrimination in Federally-Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act," 49 C.F.R. Part 21. The Contractor shall obtain the same assurances from its joint venture partners, subcontractors, and subconsultants by including this assurance in all subcontracts entered into under this Agreement. Failure by the Contractor to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as the District deems appropriate.

During the performance of this Contract, Contractor and its subcontractor shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (e.g., cancer), age (over 40), marital status, and denial of family care leave. Contractor and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Contractor and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code §12990 (a-f) *et seq.*) and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285 *et seq.*). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Contract by reference and made a part hereof as if set forth in full. Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other Agreement.

Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Contract.

**35. DIVERSITY PROGRAM FOR CONTRACTS**

The District, recipient of federal financial assistance from the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA), is committed to and has adopted a Diversity Program for Contracts in accordance with federal regulations 49 CFR Part 26, issued by the U. S. Department of Transportation (U.S. DOT).

It is the policy of the District to ensure nondiscrimination in the award and administration of all contracts and to create a level playing field on which Disadvantaged Business Enterprises (DBEs) can compete fairly for contracts and subcontracts relating to the District's construction, procurement and professional services activities. To this end, the

District has developed procedures to remove barriers to DBE participation in the bidding and award process and to assist DBEs to develop and compete successfully outside of the DBE Program. In connection with the performance of this contract, the Contractor will cooperate with the District in meeting these commitments and objectives. The District reserves the right to require the Contractor to provide additional DBE information.

Pursuant to 49 CFR §26.13, and as a material term of any agreement with the District, the Contractor hereby makes the following assurance and agrees to include this assurance in any agreements it makes with Subcontractors in the performance of this contract:

The **Contractor** shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of U.S. DOT-assisted contracts. Further, the **Contractor** agrees to comply with all provisions prohibiting discrimination on the basis of race, color, or national origin of Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. §§ 2000d *et seq.*, and with U.S. DOT regulations, "Nondiscrimination in Federally-Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act," 49 C.F.R. Part 21. The Contractor shall obtain the same assurances from its joint venture partners, subcontractors, and subconsultants by including this assurance in all subcontracts entered into under this Agreement. Failure by the Contractor to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as the District deems appropriate.

### 35.1 **DBE Eligibility**

A small business concern must be certified as a DBE by any recipient of U.S. DOT funds acceptable to the District in accordance with 49 CFR Part 26. It is the Contractor's responsibility to verify that DBEs are certified.

- A. **Disadvantaged Business Enterprise.** A DBE is a for-profit, small business concern:
1. That is at least fifty-one percent (51%) owned by one or more individuals who are both socially and economically disadvantaged, or, in the case of a corporation, in which fifty-one percent (51%) of the stock is owned by one or more such individuals; and
  2. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.
- B. **Small Business Concern.** A small business concern shall meet the definition and size standards of an existing small business as required by the Small Business

Administration pursuant to 13 CFR Part 121, and the firm's annual average gross receipts for the previous three years cannot exceed \$23.98 million.

- C. **Socially and Economically Disadvantaged Individuals.** There is a rebuttable presumption that socially and economically disadvantaged individuals are persons who are citizens or lawful permanent residents of the United States and who are: Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent-Asian Americans, Women, or a member of any additional group that is designated as socially and economically disadvantaged by the Small Business Administration. Additionally, any individual may demonstrate to the certifying agency by a preponderance of evidence, that s/he is socially and economically disadvantaged on a case-by-case basis.

An individual cannot be presumed or determined to be economically disadvantaged if s/he has a personal net worth that exceeds \$1.31 Million, excluding the individual's ownership interest in the DBE firm and the individual's equity in her/his primary residence. Additionally, if an individual is able to accumulate substantial wealth, as defined in 49 CFR 26.67(b)(ii)(A), the individual's presumption of economic disadvantage can be rebutted.

### 35.2 **DBE Participation Goal**

- A. **DBE Participation Goal for the Performance of this Contract.** Proposers are strongly encouraged to obtain Disadvantaged Business Enterprise (DBE) participation on this project, although there is no contract-specific DBE goal.
- B. **Available DBE Resources.** Listings of certified DBEs are available from the California Unified Certification Program DBE Directory, which may be obtained by visiting the California Department of Transportation website at [www.dot.ca.gov/hq/bep/find\\_certified.htm](http://www.dot.ca.gov/hq/bep/find_certified.htm) or by contacting the DBE Program Office (Office) at (415) 257-4581.

The DBE Directory does not in any way prequalify the certified firms with respect to licensing, bondability, competence or financial responsibility. The Office also maintains a DBE resource list of organizations that promote DBE participation in contracts, which will be provided upon request.

Contractors are encouraged to use services offered by financial institutions owned and controlled by socially and economically disadvantaged individuals. To obtain a list of these financial institutions, please contact the Office.

### 35.3 **Determining the Amount of DBE Participation**

Pursuant to 49 CFR §26.55, DBE participation includes that portion of the contract work actually performed by a certified DBE with its own forces. A DBE may participate as a



prime contractor, subcontractor, joint venture partner, or vendor or supplier of materials or services required by the contract.

A DBE's participation can only be counted if it performs a commercially useful function on the contract as defined in 49 CFR §26.55(c). A DBE performs a commercially useful function when it actually performs, manages and supervises a portion of the work involved. A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation. There is a rebuttable presumption that if the DBE is not responsible for at least 30% of the work with its own forces, or subcontracts a greater portion of the work than the normal industry standard, it is not performing a commercially useful function.

### 35.4 Contract Compliance

A. **Substitution of Subconsultants/Subcontractors/Suppliers.** The Contractor shall notify the District in writing of any request to substitute a DBE subcontractor and provide appropriate documentation substantiating the substitution. The Contractor must make good faith efforts to substitute an original DBE subcontractor with a small business concern. Any substitution of a DBE on this contract is subject to the written approval of the District.

District may provide such written consent only if it agrees, for reasons stated in District's concurrence document, that Contractor has good cause to terminate the DBE firm. For purposes of this paragraph, good cause includes the following circumstances:

- The listed DBE subcontractor fails or refuses to execute a written contract;
- The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of Contractor;
- The listed DBE subcontractor fails or refuses to meet Contractor's reasonable, nondiscriminatory bond requirements;
- The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
- The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1200 or applicable state law;
- Contractor has determined that the listed DBE subcontractor is not a responsible contractor;
- The listed DBE subcontractor voluntarily withdraws from the Project and provides to Contractor written notice of its withdrawal;
- The listed DBE is ineligible to receive DBE credit for the type of work required;

- A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the Contract;
- Other documented good cause that you determine compels the termination of the DBE subcontractor. Provided, that good cause does not exist if Contractor seeks to terminate a DBE it relied upon to obtain the Contract so that Contractor can self-perform the work for which the DBE contractor was engaged or so that Contractor can substitute another DBE or non-DBE contractor after Contract award.

Before transmitting to District Contractor's request to terminate and/or substitute a DBE subcontractor, the Contractor must give notice in writing to the DBE subcontractor, with a copy to District, of intent to request to terminate and/or substitute, and the reason for the request.

Contractor must give the DBE (5) five days to respond to Contractor's notice and advise District and Contractor of the reasons, if any, why DBE objects to the proposed termination of its subcontract and why District should not approve Contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), Contractor may provide a response period shorter than (5) five days.

In addition to post-award terminations, the provisions of this Section apply to pre-award deletions of or substitutions for DBE firms put forward by offerors in negotiated procurements.

Under the circumstances a DBE subcontractor is terminated, or fails to complete its work on the contract for any reason, the Contractor must make good faith efforts to find another DBE subcontractor to substitute for the original DBE.

- B. DBE Certification Status.** If a DBE Subcontractor is decertified during the life of the project, the decertified Subcontractor shall notify the Contractor in writing with the date of decertification. If a Subcontractor becomes a certified DBE during the life of the project, the Subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Project Manager.
- C. Prompt Payment to Subcontractors.** The Contractor shall pay any Subcontractor approved by the District for work that has been satisfactorily performed no later than seven (7) days from the date of the Contractor's receipt of progress payments by the District.

The District shall hold retainage from the Contractor and shall make prompt and regular incremental acceptances of portions of the contract work, as determined by the District, and pay retainage to the Contractor based on these acceptances. The Contractor or Subcontractor shall return all monies withheld in retention from all Subcontractors within 30 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the

contract work by the District. Any delay or postponement of payment may take place only for good cause and with the District's prior written approval.

Any violation of these provisions shall subject the violating Contractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the California Business and Professions Code. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or Subcontractor in the event of a dispute involving late payment, or nonpayment by the Contractor, or deficient subcontractor's performance, or noncompliance by a Subcontractor. This clause applies to both DBE and non-DBE Subcontractors.

In the event the Contractor does not make progress payments or release retentions to the Subcontractors in accordance with the time periods in this section, the Contractor will be subject to a charge of two percent (2%) per month on the untimely or improperly withheld payment.

- D. Reporting Requirements.** The Contractor shall maintain records of all DBE participation in the performance of the contract, including subcontracts entered into with certified DBEs and all materials purchased from certified DBEs.

The Contractor shall complete and submit the Monthly Prompt Payment Report and, if applicable, the Monthly DBE Trucking Verification, in forms to be provided by the District, within fifteen (15) days from the date of Contractor's receipt of progress payments.

The completed Monthly Prompt Payment Report shall provide the name, address, date of payment, and the total dollar amount actually paid to each Subcontractor performing work on the contract.

If the Contractor fails to submit the Monthly Prompt Payment Report or the Monthly DBE Trucking Verification (if applicable) within the time period required in this section and has not received written approval for an extension, the Contractor will be assessed an administrative deduction of fifty dollars (\$50) each day the report is late.

Upon completion of the contract, the Contractor shall complete and submit the Final Report – Utilization of Disadvantaged Business Enterprises (DBE), in a form to be provided by the District. Final payment will not be processed until the Final Report is submitted and approved by the District.

- E. Administrative Remedies.** In the event the Contractor fails to comply with the DBE requirements of this contract in any way, the District reserves the right to implement administrative remedies which may include, but are not limited to, withholding of progress payments and contract retentions, imposition of liquidated damages, and termination of the contract in whole or in part.

## **36. CONFLICT OF INTEREST**

### **36.1 General**

Depending on the nature of the work performed, a Contractor of District may be subject to the same conflict of interest prohibitions that govern District employees and officials (Cal. Govt. Code Section 1090 et seq. and Cal. Govt. Code Section 87100 et seq. as well as all applicable federal regulations and laws). During the proposal process or the term of the Agreement, Contractor and their employees may be required to disclose financial interests.

The Contractor warrants and represents that it presently has no interest and agrees that it will not acquire any interest that would present a conflict of interest under California Government Code §1090 et seq. or §87100 et seq. during the performance of the Work under this Agreement. The Contractor further covenants that it will not knowingly employ any person having such an interest in the performance of this Agreement. Violation of this provision may result in this Agreement being deemed void and unenforceable.

Depending on the nature of the work performed, Contractor may be required to publicly disclose financial interests under the District Conflict of Interest Code. Upon receipt, the Contractor agrees to promptly submit a Statement of Economic Interest on the form provided by District.

No person previously in the position of Director, Officer, employee, or agent of District may act as an agent or attorney for, or otherwise represent the Contractor by making any formal or informal appearance, or any oral or written communication, before District, or any Officer or employee of District, for a period of twelve (12) months after leaving office or employment with District if the appearance or communication is made for the purpose of influencing any action involving the issuance, amendment, award or revocation of a permit, license, grant, or contract.

### **36.2 Organizational Conflicts of Interest**

Contractor must take all reasonable measures to preclude the existence or development of an organizational conflict of interest in connection with work performed under this Agreement and other solicitations. An organizational conflict of interest occurs when, due to other activities, relationships, or contracts, a firm or person is unable, or potentially unable, to render impartial assistance or advice to District; a firm or person's objectivity in performing the Agreement work is or might be impaired; or a firm or person has an unfair competitive advantage in proposing for award of an Agreement as a result of information gained in performance of this or some other Agreement.

Contractor may not engage the services of any Subcontractor or independent contractor on any work related to this Agreement if the Subcontractor or independent contractor, or any employee of the Subcontractor or independent contractor, has an actual or apparent organizational conflict of interest related to the Work contemplated under this Agreement.

If at any time during the term of this Agreement Contractor becomes aware of an organizational conflict of interest in connection with the work performed hereunder, Contractor immediately must provide District with written notice of the facts and circumstances giving rise to this organizational conflict of interest. Contractor's written notice will also propose alternatives for addressing or eliminating the organizational conflict of interest. If at any time during the term of this Agreement, District becomes aware of an organizational conflict of interest in connection with Contractor's performance of the work hereunder, District must similarly notify Contractor. In the event a conflict is presented, whether disclosed by Contractor or discovered by District, District will consider the conflict presented and any alternatives proposed and meet with the Contractor to determine an appropriate course of action. District's determination as to the manner in which to address the conflict will be final.

During the term of this Agreement, Contractor must maintain lists of its employees, and the Subcontractors and independent contractors used and their employees. Contractor must provide this information to District upon request. However, submittal of such lists does not relieve the Contractor of its obligation to assure that no organizational conflicts of interest exist. Contractor must retain this record for five (5) years after District makes final payment under this Agreement. Such lists may be published as part of future District solicitations.

Contractor will maintain written policies prohibiting organizational conflicts of interest and must ensure that its employees are fully familiar with these policies. Contractor must monitor and enforce these policies and must require any Subcontractors and affiliates to maintain, monitor and enforce policies prohibiting organizational conflicts of interest.

Failure to comply with this Section may subject the Contractor to damages incurred by District in addressing organizational conflicts that arise out of work performed by Contractor, or to termination of this Agreement for breach.

### **37. PROHIBITED INTEREST**

No member, officer, or employee of District, during his or her tenure or for one year after that tenure, may have any interest, direct or indirect, in this Agreement or the proceeds under this Agreement.

### **38. LIMITATIONS ON COVENANTS NOT TO COMPETE**

Contractor acknowledges that in the context of employment agreements, covenants not to compete, sometimes referred to as non-competition or non-compete clauses, are, with limited exceptions, void and unenforceable in California. If Contractor or any Subcontractor has any employment agreements that contain covenants not to compete that are not supported by an exception pursuant to California law, Contractor must release its employees from any such covenant not to compete (and will require the relevant Subcontractors to also agree to do so), if (i) Contractor (or its Subcontractor) is unable or unwilling to carry out the implementation, installation, or support/maintenance of the System or (ii) if District is entitled to release of source code pursuant to any software license or source code escrow agreement. Contractor also agrees that neither it nor any Subcontractor will intentionally enter into an employment agreement that Contractor or Subcontractor, as the case may be, knows is void and unenforceable in California.

Any violation by Contractor of the requirements of this Section will be considered a material breach of this Agreement and will entitle District to (1) take any and all measures and (2) seek any and all remedies provided by this Agreement and as authorized by law and equity.

In the event that any of the release conditions set forth in any source code escrow agreement between the Parties are satisfied and the source code is released to District, District will have the right to hire Contractor's personnel, its Subcontractors or Subcontractors' personnel for any reason related to the maintenance and operation of the System. The Contractor and its Subcontractors may not interfere with any such efforts to hire any of Contractor's or Subcontractors' personnel. Contractor agreements with personnel and/or Subcontractors that restrict employment by District must be waived under such circumstances. Contractor must include this provision in all of its subcontracts

### **39. ATTORNEYS' FEES**

If any legal proceeding should be instituted by either of the Parties to enforce the terms of this Agreement or to determine the rights of the Parties under this Agreement, the prevailing Party in said proceeding will recover, in addition to all court costs, reasonable attorneys' fees.

### **40. COMPLIANCE WITH APPLICABLE POLICIES, PRACTICES, AND PROCEDURES OF DISTRICT**

The Contractor must observe and obey (and compel its officers, employees, Subcontractors, guests, and those doing business with it, to observe and obey) all policies, practices, and procedures of District. In particular, Contractor must comply with all District policies and procedures that apply to safety and security, including without limitation all cyber-security policies, as well as all data access and data security procedures and policies as may exist now or as may be created or modified during the course of performance of this Agreement. Contractor must update or modify its required safety or security plans in order to comply with any modifications or updates to District's safety and security policies and procedures; any such required updates must be within the scope of Contractor's work and will not be considered changes subject to additional time or compensation. Contractor must familiarize itself with and perform the work required under this Agreement in compliance with all applicable current and successor federal, California and local laws and ordinances.

### **41. PUBLICITY**

The Contractor, its employees, Subcontractors, and agents shall not refer to District, or use any logos, images, or photographs of District for any commercial purpose, including, but not limited to, advertising, promotion, or public relations, without District's prior written consent. Such written consent will not be required for the inclusion of District's name on a customer list. The Contractor must refer all inquiries from any news media organization to District, and must comply with the procedures of District regarding statements to the media relating to this Agreement.

**42. APPLICABLE LAW**

This Agreement, its interpretation and all work performed under it will be governed by the laws of the State of California. All lawsuits and legal proceedings related to this Agreement, or to any rights or any relationship between the Parties arising therefrom must be solely and exclusively initiated and maintained in State courts located in San Francisco County or in federal courts located in the Northern District of California. Venue will be in San Francisco County, California. The Contractor must comply with all federal, State, and local laws, rules, and regulations applicable to the Agreement and to the work to be done hereunder, including all rules and regulations of District.

**43. RIGHTS AND REMEDIES**

The rights and remedies of the Parties provided herein are not exclusive and are in addition to any other rights and remedies provided by law or under the Agreement.

**44. BINDING ON SUCCESSORS**

All of the terms, provisions, and conditions of this Agreement will be binding upon and inure to the benefit of the Parties and their respective successors, assigns and legal representatives.

**45. WAIVER/INVALIDITY**

No waiver of a breach of any provision of this Agreement by either Party constitutes a waiver of any other breach of the provision, or of any other breach of the provisions of this Agreement. Failure of either Party to enforce any provision of this Agreement at any time will not be construed as a waiver of that provision. The invalidity in whole or in part of any provision of this Agreement does not void or affect the validity of any other provision.

**46. SURVIVAL**

The parties' rights under the following clauses will survive expiration or termination of this Agreement for any reason: 10, 11, 12, 13, 20, 21, 27, 30, 32, 36,37, 39, 42, 43, 45.

**47. SEVERABILITY**

If any provision of this Agreement is deemed invalid or unenforceable, that provision will be reformed and/or construed consistently with applicable law as nearly as possible to reflect the original intentions of this Agreement, and in any event, the remaining provisions of this Agreement will remain in full force and effect.

**48. CONSTRUCTION**

The parties have participated jointly in the negotiation and drafting of this Agreement. In the event an ambiguity or question of intent or interpretation arises with respect to this Agreement, this Agreement will be construed as if drafted jointly by the parties and in accordance with its fair meaning. There will be no presumption or burden of proof favoring or disfavoring any party by virtue of the authorship of any of the provisions of this Agreement.

**49. NO THIRD PARTY BENEFICIARIES**

This Agreement is not for the benefit of any person or entity other than the Parties.

**50. COUNTERPARTS**

This Agreement may be executed in one or more counterparts, each of which will be deemed an original. All counterparts will be construed together and shall constitute one agreement.

**51. CLAUSE HEADINGS**

The headings and subheadings of clauses contained herein are used for convenience and ease of reference and do not limit the scope or intent of the clause.

**52. ENTIRE AGREEMENT; MODIFICATION**

This Agreement constitutes the complete agreement between the Parties and supersedes any prior written or oral communications. This Agreement may be modified or amended only by written instrument signed by both the Contractor and District following approval thereof, if necessary, by the District Board of Directors.



IN WITNESS WHEREOF, the parties hereto have executed this Agreement by their duly authorized representatives as of the day and year first above written.

GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT:

CONTRACTOR:

KAPSCH TRAFFICCOM IVHS INC.  
(See footnote below)\*

By: DocuSigned by:  
J. Dietrich Stroeh  
62A035E725924BE...  
J. Dietrich Stroeh  
President, Board of Directors

By: DocuSigned by:  
Chris Murray  
6FAEB0CFC594E...  
Name: Christopher F. Murray  
Title: President and CEO

ATTEST:  
By: DocuSigned by:  
Amorette M. Ko-Wong  
F24F4276E3A9411...  
Amorette M. Ko-Wong  
Secretary of the District

By: DocuSigned by:  
Michael Hofer  
393C0D11C8A...  
Name: Michael Hofer  
Title: mh

APPROVED AS TO FORM:

DocuSigned by:  
Steve Miller  
55DB0EBFDF42448...  
Legal Counsel

\*Note: This Agreement must be executed by two Corporate Officers, consisting of:

- (1) the President, Vice President or Chair of the Board, *and*
- (2) the Secretary, Assistant Secretary, Chief Financial Officer, Assistant Chief Financial Officer, Treasurer, or Assistant Treasurer.

In the alternative, this Agreement may be executed by a single Officer or a person other than an Officer provided that evidence satisfactory to District is provided demonstrating that such individual is authorized to bind the Corporation (e.g. a copy of a certified resolution from the Corporation's Board or a copy of the Corporation's bylaws).

### Locations of RFP Component Parts

RFP for Replacement Toll Collection System	See RFP
Attachment A: Scope of Work and Requirements Appendix A – Requirements Traceability Matrix (RTM) Addendum to Appendix A - RTM Appendix B – Milestone Schedule Appendix C – Preliminary Gantry Concepts/Drawings Appendix D – Regional CSC ICD Appendix E – CTOC File Specification	See RFP Revised – See Addendum No. 1 Added – See Addendum No. 3 See RFP See RFP See SOW Appendix D See SOW Appendix E
Attachment B: Price Proposal Forms Price Proposal Instructions Price Proposal Sheets	See RFP Revised – See Addendum No. 3 Revised – See Addendum No. 3
Attachment C: Sample Certificate of Insurance	See RFP
Attachment D: Sample Agreement	See RFP
Attachment E: Acknowledgment of Addenda	See RFP
Attachment F: Prime Contractor and Subcontractor/Subconsultant/Supplier Report	See RFP
Attachment G: Description of the Selection Process of Subcontractors/Subconsultants/Suppliers	See RFP
Attachment H: Performance Bond Form	See RFP

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REPLACEMENT TOLL COLLECTION SYSTEM**

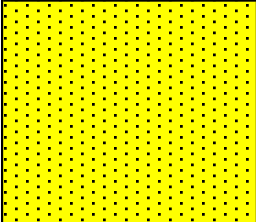
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10. Attachment H: Performance Bond Form .....	PB 1-3

**APPENDIX A –  
REQUIREMENTS  
TRACEABILITY MATRIX  
(See Attached Excel File)**

**APPENDIX A POSTED AS SEPARATE FILE ON DISTRICT'S WEBSITE.**

**APPENDIX B –  
MILESTONE SCHEDULE**

MS No.	Project Phase & Milestone Name	Deliverables Names	Predecessor Approved Deliverables/Activities Names	Estimated date assuming NTP of 3/1/17 And Go-live date of 12/28/18
<b>Phase 1: Definition and Business Rules</b>				
1.1	Project Initiation	Master Project Schedule	N/A	3/31/17
1.2	Requirements Traceability Matrix	Requirements Traceability Matrix (RTM)	BR and Req Def workshop	4/15/17
1.3	Gantry Requirements Plan	Gantry Requirements Plan (GRP)	BR and Req Def workshop	4/15/17
<b>Phase 2: System Design</b>				
2.1	Preliminary Design	Preliminary System Design Document	RTM - Baseline for Phase 2	4/30/17
2.2	Detailed Design	Detailed System Design Document	RTM, PSDD	6/29/17
		Gantry Details Drawings	RTM, GRP, PSDD	6/29/17
		RCSC ICD	RTM, PSDD	6/29/17
		DSDD Workshops	DSDD	7/14/17
		DSDD for Approved	Workshops	7/29/17
2.3	Final Design	Final System Design Document (including RCSC ICD and Gantry Drawings)	DSDD Approval	8/28/17
		Client Workshops	FSDD	9/12/17
		FSDD Approval	Workshops	9/27/17
<b>Phase 3: System Development</b>				
3.1	CSC Integration Test	CIT Plan + Script	RTM, Functional Demo	TSI Schedule
3.2	Factory Acceptance Test	FAT Plan + Script	RTM - Updated for Phase 3, Functional Demonstrations	TSI Schedule
3.3	Accepted FAT and CIT Reports	Accepted FAT and CIT Report	FAT	TSI Schedule

Phase 4: Installation				
4.1	Installation Plan	Installation Plan	RTM - Updated for Phase 4	TSI Schedule
4.2	System Maintenance Planning	System Maintenance Plan	RTM - Updated for Phase 4	TSI Schedule
4.3	Gantry Equipment Field Test	GEFT Plan + Script	RTM, Installation Plan	TSI Schedule
		Accepted GEFT Report	GEFT	TSI Schedule
Phase 5: Transition				
5.1	Data Migration Planning	Data Migration Plan	Transition Plan	TSI Schedule
5.2	Business Continuity Planning	Business Continuity	Transition Plan	TSI Schedule
5.3	Training Materials	Final Training Materials (Including System User Manuals).	RTM, Transition Plan	TSI Schedule
5.4	Training Courses	Training Courses	Final Training Materials	11/28/18
5.5	Production Readiness Test	Transition Plan (PRT, Training and Cutover Plans) + PRT Script	RTM - Updated for Phase 5	TSI Schedule
		PRT Report + Punch List	PRT	TSI Schedule
5.6	Cutover	Cutover Plan	RTM - Updated for Phase 5	TSI Schedule
5.7	Go Live	Go Live	Accepted PRT Report	12/28/18
Phase 6: Maintenance and System Acceptance				
6.1	As-built documentation	As-Built SDD	RTM	2/26/19
6.2	System Acceptance Test	SAT Plan	Approved RTM, Training	11/28/18
		Accepted SAT Report	RTM, SAT	6/26/19
<b>Five Year Maintenance Completion Date</b>				<b>12/28/23</b>
Key	 <p>These cells represent Hard Deadline dates. LD is \$1,000/day for every day the deliverable is late, capped at the value of the contract.</p>			

**APPENDIX C –**

**PRELIMINARY GANTRY**  
**CONCEPT/DRAWING**



# Proposed Location Under Consideration



**South of the  
Toll Plaza**

**APPENDIX D –**

**REGIONAL**

**CUSTOMER SERVICE CENTER**

**INTERFACE CONTROL DOCUMENT**

**\* NOTE: This document is included for reference only and will be finalized during implementation.**

APPENDIX D POSTED AS SEPARATE FILE ON DISTRICT'S WEBSITE.

**APPENDIX E –**

**CALIFORNIA TOLL**

**OPERATORS COMMITTEE (CTOC)**

**FILE SPECIFICATION**

APPENDIX E POSTED AS SEPARATE FILE ON DISTRICT'S WEBSITE.

**PRICE PROPOSALS POSTED AS SEPARATE FILE ON DISTRICT'S WEBSITE.**

## **1 GENERAL INSTRUCTIONS**

These instructions pertain to the Price Proposals for the District's Replacement Toll System RFP.

Proposers shall submit their Price Proposals using the Price Proposal sheets included in RFP.

The Price Proposal sheets are provided in Excel format worksheets for ease of completion and checking.

Some Price Proposal sheets include the costs for both the Contract base term and an optional extension period. It is required that the Proposer completes the base term and optional extension Price Proposal sheets. Whether or not the District elects to exercise its option to extend the Contract for one or both of these periods is solely at the District's discretion.

Proposers shall complete the Price Proposal in accordance with the following instructions:

1. The Price Proposal Sheets shall constitute the full and complete Price Proposal for compensation for performance of the TSI's obligations and Work under this contract.
2. Proposers must complete the Price Proposal sheets in their entirety as described in these Price Proposal Instructions.
3. The Price Proposal sheets are password protected and shall not be unlocked by Proposers, who may only enter data into the unlocked cells and shall not alter the Price Proposal sheets other than in accordance with these Price Proposal Instructions.
4. Not all Pricing Sheets require or allow Proposer input. Sheets identified with a *light green tab* require input. Other sheets are for information only and do not allow input.
5. The light pink cells within the Price Sheets are mandatory for the Proposer to complete. The yellow cells are optional for the Proposer to complete.
6. The sheets have built-in indicators to help inform proposers missing values or sections. Red text is used to indicate a locked cell where calculation are expected to occur and values other than zero will display. However, it is the Proposer's responsibility to check for errors or lack of completeness when filling out the sheets.
7. Sheets have a specific number of rows and columns that cannot be modified. The proposer shall use the space provided to fill in the required values.
8. Proposers shall consider the assumptions included in each sheet's footnotes.
9. On the sheets, some values are calculated based on data entered elsewhere in the sheet or in another sheets. While some formulas may be visible to Proposers for informational purposes, these are all locked and cannot be edited.
10. While the District has made every effort to ensure the Price Proposal Sheets contain accurate formulas and calculation, Proposers are required to independently verify that calculations are being performed correctly and to notify the District of the error. Any errors reported before the required proposal due date will result in an extension in the price proposals due date for all Proposers.

11. The District may waive or correct any error appearing in a Proposer's completed Price Proposal if the correct amount can be clearly ascertained from the information provided; however, the District is under no obligation to do so.
12. If zero quantities are appropriate for a line item in the Proposal, a zero must be entered into the corresponding cell. Not entering a required value will render the Price Proposal incomplete. In addition, all items identified by the District in the Price Proposal sheets will be assumed to be included in the Price Proposal.
13. The District reserves the right to reject Price Proposals that are not completed in accordance with the instructions set forth herein.
14. The Price Proposal shall be inclusive of all items including but not limited to labor, Equipment, Software, overhead, profit, fees, applicable taxes, warranty, insurance and shipping needed to meet the requirements of the RFP. No price escalation will be allowed above the prices provided on the Price Proposal Sheets to complete the Work.

### **1.1 GENERAL CONCEPTS USED IN THE SHEETS**

1. **Quantity:** Quantities for some items are provided by the District while other items are left for the Proposer to enter in the applicable cell. Quantities provided by the District must not be changed by the Proposer. If the Proposer disagrees with the quantities provided by the District, the Proposer must inform the District before the submittal deadline. Prices provided by the Proposer are binding.
2. **Unit:** This is the unit of quantity for the proposed items. Units are provided by the District and are unmodifiable. The Proposer must allocate its quantities and unit prices based on these units.
3. **Unit Price:** This is the individual price that corresponds with the specific service, deliverable, unit, and quantity.
4. **Line Item number:** The sheets have line items numbers to help the Proposer and the District reference the items on each sheet.
5. **Line item descriptions:** Descriptions for line items are provided by the District under their respective column. In some cases, such as when entering additional equipment or staffing, space is left for the Proposer to fill in the description of the additional items. If the description is provided by the District, then it must not be modified by the Proposer.
6. **Staff Position:** The sheets related to staffing refer to the position of title of the proposed personnel. Only key staffing positions have been provided by the District to allow for naming convention and listing flexibility. Any positions included in the Technical Proposal per the RFP shall have a corresponding line item in the Price Proposal.

## 2 SPECIFIC INSTRUCTIONS FOR COMPLETING THE PRICE PROPOSAL SHEETS

The Price Proposal contains one (1) output sheet, Implementation Milestone Payments Allocation, and five (5) input sheets including one (1) Total Price sheet, one (1) Implementation Costs Itemization sheet, two (2) schedules for payment, Maintenance Payments Schedule and Monthly Maintenance Labor Detail, and one (1) Proposed Project Staff Labor Rates sheet.

Table 2-1 provides the Price sheet number (e.g. PS-1, PS-2, etc.), sheet title, and a brief description of the purpose of each sheet.

**Table 2-1 – Pricing Sheets Summary**

Sheet Number	Sheet Title	Purpose
PS-1	Implementation Cost Itemization	This sheet collects information from the Proposer of how the total implementation (Project Phases 1-6) price is itemized by project component per the RFP Scope of Work.
PS-2	Implementation Milestones Payments Allocation (Output sheet – for information only)	This informational sheet calculates the implementation milestone payments through the assigned percentages.
PS-3A	Maintenance Payments Schedule	This sheet collects information from the Proposer on the itemized monthly maintenance fee for the base contract maintenance period and optional extension period. Labor item comes from sheet PS-3B.
PS-3B	Monthly Maintenance Labor Detail	This sheet collects information from the Proposer on the estimated number of monthly hours per Maintenance Staff Position that is factored in the Payment Schedule of sheet PS-3A.
PS-4	Proposed Project Staff Labor Rates	This sheet collects the labor rates for all proposed staff on the project during the expected implementation and maintenance phases of the base contract and optional extension phase.
PS-5	Total Price	This sheet aggregates the prices from Sheets PS-1 and PS-3A and also collects information from the Proposer on additional total costs for different lane configurations.

The sections below provide specific instructions for each one of these sheets.

## 2.1 PS-1 – IMPLEMENTATION COST ITEMIZATION

In this sheet, Proposers shall fill-in the following *mandatory (light pink)* values:

1. **Unit Price:** Enter unit prices in the Price column that correspond to each line item. It assumes a configuration of a total of five (5) lanes. The following should be taken into account:
  - The price for the Design and Documentation include the development of the design documents and planning documents to meet the requirements of the RFP, including design workshops, as well as all project plans including the Master Test Plan, but excluding the specific System Tests listed separately.
  - The price for the Lane and Host Systems, Network Infrastructure include materials, labor and commissioning. Installation for all components is considered a separate project development line item (#3). Software costs include licensing and custom development.
  - The price for the System Tests include all steps to plan, conduct and report the results of these tests.
2. **Quantity:** Enter quantities in the Quantity column that corresponds to each mandatory item. This applies to the Lane System component only. The following should be taken into account:
  - For line items 10 and 11 (Zone Controller Hardware and Software), the quantities are required because these depend on the Proposer’s technical solution.

In this sheet, Proposers may also fill in the *optional (light yellow)* values:

1. **Implementation Component:** Enter a description of any additional line item needed to satisfy the proposed technical solution which is not considered by the Proposer to be included in the Unit price of the mandatory line items. Please take into account the following:
  - The only component that does not provide for additional items within its group of items is “System Testing.”
  - “Other Optional Items” can include items from any implementation component group; however, it is mandatory to list each Third Party Support Contract name here.
2. **Unit:** Enter the unit corresponding to the additional entered description.
3. **Quantity:** Enter the corresponding quantity to the entered description and unit.
4. **Unit Price:** Enter the corresponding unit price to the entered description, quantity and unit. Please consider the following.

## Price Proposal Instructions

- For Third Party Support contracts listed under “Other Optional Items,” do not include the price.
5. **Notes on assumptions:** Enter any notes or assumptions that may help describe the justification of your inputted values for the any of the mandatory or optional items.

### 2.2 PS-3A – MAINTENANCE PAYMENT SCHEDULE

In this sheet, Proposers shall fill the following *mandatory (light pink)* values:

1. **Maintenance Fee Per Month:**

- a. Enter the proposed monthly maintenance amount in Year 1 for “Materials” and other optional (line items #3-5) Base Contract Maintenance Fee line items.
- b. Enter the proposed monthly maintenance amount in Year 6 for “Materials” and other optional (line items #11-13) Optional Extension Maintenance Fee line items.

The labor item automatically populates from Sheet PS-3B.

2. **Annual Cost Percentage Change**

- a. *Maintenance Year 1-5:* Enter the annual percentage increase for years 1-5. The percentage increase shall apply to each of those years.
  - For “Materials” and other optional Base Contract Maintenance Fee line item, enter a percentage value.

For “Labor”, the value is populated for each Year from the sheet PS-4.

- b. *Maintenance Year 6-8:* A value is mandatory for all items listed (“Labor” and “Materials”) as well as values corresponding to any optional line items (#11-13).

In this sheet, Proposers may also fill in the *optional (light yellow)* values:

1. **Maintenance Component:** Enter the description for additional line items that you consider appropriate to capture the maintenance scope of work. This is applicable to both maintenance phases (see line items 3-5 and 11-13, respectively).

The following should be taken into account:

- The number of months per year and total cost per year assumes completion of a contract year during the maintenance phase. These yearly values are included in order to calculate the total expected fees on yearly and contract period bases.



## Price Proposal Instructions

- If any of the values are not inputted for any of the contract periods, the corresponding contract period total will show “Incomplete” in red text.

### 2.3 PS-3B – MAINTENANCE LABOR PER MONTH

In this sheet, Proposers shall fill the following *mandatory (light pink)* values:

1. **Staff position:** Enter the staff position for all Maintenance staff considered for this project. The position must be unique (i.e., not repeated) and include any required proposed staff per the Proposal Instructions. Any maintenance staff positions named in the Maintenance section of the Proposal must have a corresponding line item on this sheet. Regardless of the above requirements, at least two (2) maintenance staff members shall be added to this sheet. Enter the staff position before entering any other value on this sheet.
2. **Base Contract:** These values correspond to Year 1 of the Base Contract Period.
  - a. *Hours/Month:* Please input the estimated number of hours per month that would be spent per each staff position. These are assumed to be constant throughout the period.

The average Hourly (Loaded) Rate is provided from PS-4.

3. **Optional Extension:** These values correspond to Year 6 (first year of the optional Extension Period).
  - a. *Hours/Month:* Please input the estimated number of hours per month that would be spent per each staff position. These are assumed to be constant throughout the period.
  - b. *Average Hourly (Loaded) Rate:* Please input the proposed rate per staff position for the base year of the optional extension period.

### 2.4 PS-4 – PROPOSED PROJECT STAFF LABOR RATES

In this sheet, Proposers shall fill the following *mandatory (light pink)* values:

1. **Key Staff – Staff name and position:** Enter the staff name for the four key positions. Names shall match the resumes provided with the Technical Proposal. Positions have already been filled out by the District.
2. **Loaded Hourly Billing Rates and Increase % by Year:**
  - a. Enter the Loaded Hourly Rate for:
    - The first year in the “Imp. Year 1” column for each position listed

## Price Proposal Instructions

- The first year in the “Maint. Year 1” for each position listed.
- b. Enter the % of year-to-year increase for Year 2 in the Imp. Year 2 column. If the implementation phase extends beyond a second year, no increase in rate will be allowed.
- c. Enter the Loaded Hourly Rate for the Maint. Year 1 column for each position listed
- d. Enter the % of year-to-year increase In Maint. Year 2 thru Maint. Year 5.

In this sheet, Proposers may also fill in the *optional (light yellow)* values:

1. **Support Staff – Staff position and name:** Enter the staff position and the name for all of the Support Staff identified in the Technical Proposal.

### 2.5 PS-5 – TOTAL PRICE

This sheet automatically inputs these values from the following sheets:

1. **PS-1 – Implementation Costs:** Line item 1, “Development.”
2. **PS-3A – Maintenance Payments:** Line item 1, “Maint Years 1-5,” “Maint Year 6,” “Maint Year 7,” and “Maint Year 8.”

These values correspond to an assumed five (5) lane configuration which is the base for the cost itemization in the sheets PS-1, PS-3A and PS-3B.

In this sheet, Proposers shall fill the following *mandatory (light pink)* values:

1. **Base Contract Period – Development and Maintenance Y1-5 (6/7 Lanes):**
  - a. In line item 2, enter the total price for implementing and the total price for maintaining a solution covering six (6) lanes instead of the base five (5) lane configuration of Line item 1.
  - b. In line item 3, enter the total price for implementing and the total price for maintaining a solution covering seven (7) lanes instead of the base five (5) lane configuration of line item 1.
2. **Optional Maintenance Contract Extension Period – Maintenance Years 6-8 (6/7 Lanes):**
  - a. In line item 2, enter the price for each year to maintain a solution covering six (6) lanes instead of the base five (5) lane configuration of Line item 1.
  - b. In line item 3, enter the price for each year to maintain a solution covering seven (7) lanes instead of the base five (5) lane configuration of Line item 1.

**APPENDIX D –**

**REGIONAL**

**CUSTOMER SERVICE CENTER**

**INTERFACE CONTROL DOCUMENT**

**\* NOTE: This document is included for reference only and will be finalized during implementation.**

# BATA

## Regional CSC

### Appendix B: Regional ICD



Final Revision  
September 2015



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# Version History

Version Number	Date	Description	Author
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# 1. Introduction

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The *VECTOR-Regional BATA Interface File Specifications* document defines the formats for all files that shall be transmitted between the BATA Regional Customer Service Center application (henceforth referred to as “VECTOR”) and the CALTRANS and GGBD Hosts (henceforth referred to as “BATA” in the remainder of the document).

The interface files allow the CSC to perform the following functions:

- Transmit comprehensive and differential/cumulative tag status files to BATA at regular intervals (time periods to be defined in business rules) on a daily basis.
- Receive regular transactions due to customers using the CALTRANS and GGBHTD agency’s facilities.
- Receive violation transactions due to customers using the CALTRANS and GGBHTD agency’s facilities.
- Transmit reconciliation feedback to the Plaza/Host of the constituent BATA agencies.

A new server, Interface Server, shall reside within the Caltrans network and a socket program will communicate with each of the Plaza servers to pull down the violation transaction details (transaction and images). This Interface Server shall communicate with the Caltrans drop box, for transfer of all incoming and outgoing files between the ATCAS host and RCSC drop box. The Interface Server, while being developed by ACS, will be administered and maintained by Caltrans after the successful implementation of the RCSC.

The interface files are defined in Table 1-1 below:

**Table 1-1 Interface files**

No.	File Name	File Ext	File Usage	Field Separator	ACK file created by -
1	CALTRANS Tag Status File	ETC	<p>Created by the VECTOR application to inform the CALTRANS Host as to the status of each tag on the system. It includes –</p> <ul style="list-style-type: none"> <li>- HOME agency tags (CALTRAND and GGBD)</li> <li>- CTOC agency tags like SANDAG, TCA, SR-91</li> </ul> <p>All the above records shall be in 1 file and zipped before transmission to CALTRANS host.</p>	‘ ’ delimited	Interface Server

No.	File Name	File Ext	File Usage	Field Separator	ACK file created by -
2	GGBD Tag Status File	ETC	<p>Created by the VECTOR application to inform the GGBD Host as to the status of each tag on the system.</p> <p>Vector will generate tag status file for CALTRANS tag range, GGBD tag range separately. Transmission from CSC to GGBD will include:</p> <ul style="list-style-type: none"> <li>- 1 CALTRANS file</li> <li>- 1 GGBD file</li> <li>- 1 file for each of the CTOC agencies</li> </ul> <p>All the above individual files, shall be zipped into one file before transmission to GGBD Host.</p>	',' separated and fixed length	GGBD Host
3	CALTRANS ETC Transaction/Violation File	TRE	Created by the CALTRANS Hosts to inform the VECTOR CSC of all regular/normal ETC transactions on accounts with a valid tag and violation transactions with or without a tag.	' ' delimited	BATA CSC
4	CALTRANS ETC Transaction Reconciliation Summary File	REC	Created by the VECTOR CSC to inform the CALTRANS Host about the disposition of toll transactions processed at the VECTOR CSC. A summary of transaction by Tour ID allows the CALTRANS Host to ensure that all transactions were properly received and processed at the VECTOR CSC and to track normal tolls.	' ' delimited	Interface Server
5	CALTRANS ETC Monthly reconciliation file (revenue attached to lane transactions)	RECA	Created by the VECTOR CSC to inform the CALTRANS Host as to the summary of the disposition of any revenue that can be tied to a transaction at the lane. This level of reconciliation allows the CALTRANS Host to ensure that all revenue is properly reconciled to generate financial reports.	' ' delimited	Interface Server
6	GGBD ETC Transaction File	REQ	Created by the GGBD Host to inform the VECTOR CSC of all home agencies tagged transactions (valid and invalid) and valid CTOC tagged transactions. (Invalid CTOC tagged transactions will be processed as violations and will not be part of this interface)	',' separated and fixed length	BATA CSC
7	GGBD Violation File	VIO	Created by the GGBD host to inform the VECTOR CSC of all violations (tagged and untagged). The record format is identical to that of the GGBD ETC Transaction file.	',' separated and fixed length	BATA CSC
8	GGBD ETC Detailed Reconciliation File	RES	Created by the VECTOR CSC to inform the GGBD Host as to the disposition (posted or rejected) of each transaction in the REQ files.	',' separated and fixed length	GGBD Host

No.	File Name	File Ext	File Usage	Field Separator	ACK file created by -
9	GGBD Violation Reconciliation File	VRES	Created by the VECTOR CSC to inform the GGBD Host as to the disposition (posted or rejected) of each transaction in the VREQ files.	',' separated and fixed length	GGBD Host
10	CALTRANS Transaction Cancellation File	CAN	Created by the CALTRANS Host to inform the VECTOR CSC of the ETC and violation transactions that need to be cancelled/ignored. This file shall contain transactions that would need to be ignored / reversed at the CSC. The transactions from this file shall not be included as part of revenue reconciliation (REC file) between the VECTOR CSC and CALTRANS Host	' ' delimited	BATA CSC
11	CALTRANS Business Day File	ADT	The CALTRANS Host generates a business day summary of transactions for the VECTOR CSC to assign the right business day to the transactions.	' ' delimited	BATA CSC
12	BATA Acknowledgement File	ACK	Created by the Receiving System to Acknowledge that the file transmitted was received in its entirety. An Acknowledgement File shall be sent for each of the above referenced files.	Fixed length	N/A
13	BATA DMV Request	DMV	Created by the VECTOR CSC to request Name and Address information from the DMV for toll evaders on the GGBD and CALTRANS Lanes.		N
14	BATA DMV Response	data	Created by the DMV System (via dedicated DMV link) to inform BATA Regional CSC about the name and address Information as a response to a DMR file (DMV Request)		N
15	BATA Violation Image Data File	VDF	Created by the BATA Hosts to inform VECTOR CSC about the details to be used to match Image to a lane transaction.	Fixed length	N
16	BATA DMV Hold/Clear Request File	dat	Created by the VECTOR CSC to request DMV Hold/clear on license plates, for toll evaders on the GGBD and CALTRANS Lanes.		N
17	BATA DMV Hold/Clear Release File	don	Created by the DMV System (via dedicated DMV link) to inform BATA Regional CSC about the status of a hold/clear request, as a response to a REQD file (DMV Hold/Clear Request)		N

No.	File Name	File Ext	File Usage	Field Separator	ACK file created by -
18	680-HOT	ETC	<p>Created by the VECTOR application to inform the HOT Host as to the status of each tag on the system.</p> <p>RCSC will generate tag status file for CALTRANS tag range, GGBD tag range separately. Transmission from CSC to HOT host will include:</p> <ul style="list-style-type: none"> <li>- 1 CALTRANS file</li> <li>- 1 GGBD file</li> <li>- 1 file for each of the CTOC agencies</li> </ul> <p>All the above individual files, shall be zipped into one file before transmission to HOT Host.</p>	',' separated and fixed length	HOT Host
19	HOT ETC Transaction File	HREQ	<p>Created by the HOT Host to inform the RCSC of all home agencies tagged transactions (valid and invalid) and valid CTOC tagged transactions. (Invalid CTOC tagged transactions will not be part of this interface)</p>	',' separated and fixed length	BATA CSC
20	HOT ETC Detailed Reconciliation File	HRES	<p>Created by the RCSC to inform the HOT Host as to the disposition (posted or rejected) of each transaction in the REQ files.</p>	',' separated and fixed length	HOT Host
21	HOT ETC Correction Transaction File	CREQ	<p>Created by the HOT Host to inform the RCSC of all home agencies tagged transactions that need to be corrected &amp; reposted with new \$\$ amount.</p>	',' separated and fixed length	BATA CSC
22	HOT ETC Detailed Reconciliation Correction File	CRES	<p>Created by the RCSC to inform the HOT Host as to the disposition (posted or rejected) of each correction transaction request in the REQ files.</p>	',' separated and fixed length	HOT Host

## 2. General file processing requirements

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1. In the current scenario since the VECTOR CSC services multiple agencies (GGHBTD and CALTRANS), a single FROM\_AGENCY\_ID shall be used in tag file and transaction file transfers with the BATA Hosts.
2. The VECTOR BATA REGIONAL CSC will transmit one tag status file to the Away CTOC agencies. The filename shall use (FROM\_AGENCY\_ID - AT). The transaction files (Toll charges file or Pay by Plate file) will also be sent as 1 merged file, which includes all CALTRANS and GGBD transactions. For all TCA customers traveling on CALTRANS and GGBD, the Toll charges file will be sent with from agency as "AT".
3. The VECTOR BATA REGIONAL CSC shall receive 1 file for both CALTRANS and GGBD transactions from CTOC agencies. Example: For all transponder in the Golden Gate ranges and CALTRANS ranges, traveling on TCA plazas, VECTOR BATA REGIONAL CSC can receive transactions files with "AT" as the destination agency.
4. All files (except for the Acknowledgement File) shall be compressed (ZIPed) using a standard Lempel-Zif compression algorithm that yields a compression rate of at least 75% (meaning a file will be reduced so that it is only 25% of its original size).
5. When compressed, file names shall be converted from {FILE\_NAME}.{FILE\_TYPE} to {FILE\_NAME}\_{FILE\_TYPE}.ZIP. Therefore, when file "20030426100000.etc" is compressed, the compressed file shall be named "20030426100000\_etc.zip".
6. All files transmitted between the VECTOR CSC and CALTRANS Host shall contain a CRC check sum as part of the trailer that shall be used to check the integrity of the file. The checksum shall follow the algorithm outlined below. VECTOR CSC to GGBD host interface will be without any checksum logic.
7. Receiving agencies shall apply, but not limit to, the following validation logic –
  - Record format validation including header, detail and trailer records.
  - Record length
  - Tag number validation, if applicable (with the Title 21 facility range)
  - Checksum validation (CALTRANS/CSC only)
  - Record count matching with counts in the header/trailer
8. All files shall follow the data format types and field validations will be performed based on the format type rules. In case the format type is not defined, the standard interface techniques will be adopted.  
Rules for



- Number fields are those fields that contain only decimal values (base 10). The data shall be left -padded with zeros. In a field of length 5, Value 100 will be represented as 00100.
  - Hex Number fields are those fields that contain only hexadecimal numerical values (base 16). Data will be Left Padded with zeros. In a field of length 5, Value 1EF will be represented as 001EF.
  - Char will be all fields will contain alphanumeric values. Data will be Right Padded with spaces. In a field of length 6, Value GGBD will be represented as "GGBD".
  - All date, time or timestamp fields will have the specified format.
  - All currency fields that have a definition of CHAR (5,2) shall be represented as \$5.05 = 5.05 and CHAR (5) shall be represented as \$5.05 = 505. The CHAR (5,2) means that there will be 2 places reserved after the decimal for that data type. The CHAR (5) means there is no decimal point for that data type.
  - All money/currency data, which is of type char (xx, x), shall be represented in the file as fixed length and right padded with spaces. The decimal point shall not be counted as part of the field length. E.g. tol\_fare\_amt of char (5,2) shall be represented as '5.05 '
9. The 32-bit Transponder ID Number Field is specified in the Title 21 standard. Refer the CTOC document (Interagency Electronic Data Interchange), section California's Definition for Title 21's 32-Bit Transponder ID Number field for the data field definitions of Tag Type, Facility code and Internal Tag Id.
  10. For the facility code ranges Refer CTOC document (Interagency Electronic Data Interchange), section California Facility Code Ranges.
  11. It will be responsibility of the file creator to push the file to the drop box or agreed upon location. Examples: In case of tag status file BATA REGIONAL CSC will push the tag status file to the agreed upon location and in case of Violation images it will be CALTRANS / GGBD Host responsibility to push the images to the agreed upon location.
  12. The first comprehensive tag download file will be sent to the ftp drop box no later than 4 am. All subsequent comprehensive tag download files will be sent in 6hour intervals (i.e. the first tag file will be no later than 4 am, then 10 am, 4 pm and 10 pm).
  13. CSC will send a daily tag status file to all CTOC agencies, no later than 1 a.m.
  14. CSC will look for the daily CTOC comprehensive tag files on the ftp drop box, no earlier than 2 am. In the event of no file being available from any CTOC agency, the previous days comprehensive tag file will be used and sent to the CALTRANS and GGBD host. The next day the latest tag file will be used to send to the CALTRANS and GGBD hosts. All tag status files sent to GGB and Caltrans during the day will include the CTOC files received by the 2 am cutoff. Any updated CTOC files received after that time will not be included in the tag status files sent to GGB and Caltrans
  15. Hex = Hex to be treated as a Hex (base 16) number. This is the ASCII representation of hex digits. Allowable ASCII characters are "0123456789ABCDEF" (note upper case alphas). There is one ASCII character for each Hex digit and therefore two ASCII characters per binary byte, left filled with ASCII zeros. The two binary bytes of:

Most Significant Byte  
MSBit                  LSBit



1	0	0	1	0	0	0	1
---	---	---	---	---	---	---	---

Least Significant Byte

MSBit	LSBit						
1	0	1	0	1	1	1	0

Would be represented in an eight character hex field as “000091AE”

- Len indicates the expected length of the field (in bytes) for certain data types or values.
- The ASCII pipe character is indicated as “|”
- The ASCII line feed character is indicated as “lf”
- The ASCII NULL character is indicated as “NULL”
- The ASCII space character is represented as “ “

### Checksum Algorithm

```

unsigned short compute_ccitt(unsigned char raw_data[], int nbytes)
{
    const unsigned short crc_polynomial=0x1021;
    int j;
    short bit_index;
    unsigned short curr_bit;
    unsigned char msb_flag;

    for(j=0;j < nbytes;j++)
    {
        for(bit_index=BITS_PER_BYTE - 1;bit_index >= 0;bit_index--)
        {
            curr_bit = raw_data[j];
            curr_bit = (curr_bit >> bit_index) & 0x1;
            if (curr_bit & 0x8000)
                msb_flag = 1;
            else
                msb_flag = 0;
            if (msb_flag == curr_bit)
                crc_ccitt <<= 1;
            else
                crc_ccitt = (2*crc_ccitt)^crc_polynomial;
        }
    }
    /* printf("CRC CCITT Check sum is %04x \n", crc_ccitt); */
    return(crc_ccitt);
}

```

## 3. Transaction Interface – CALTRANS

---

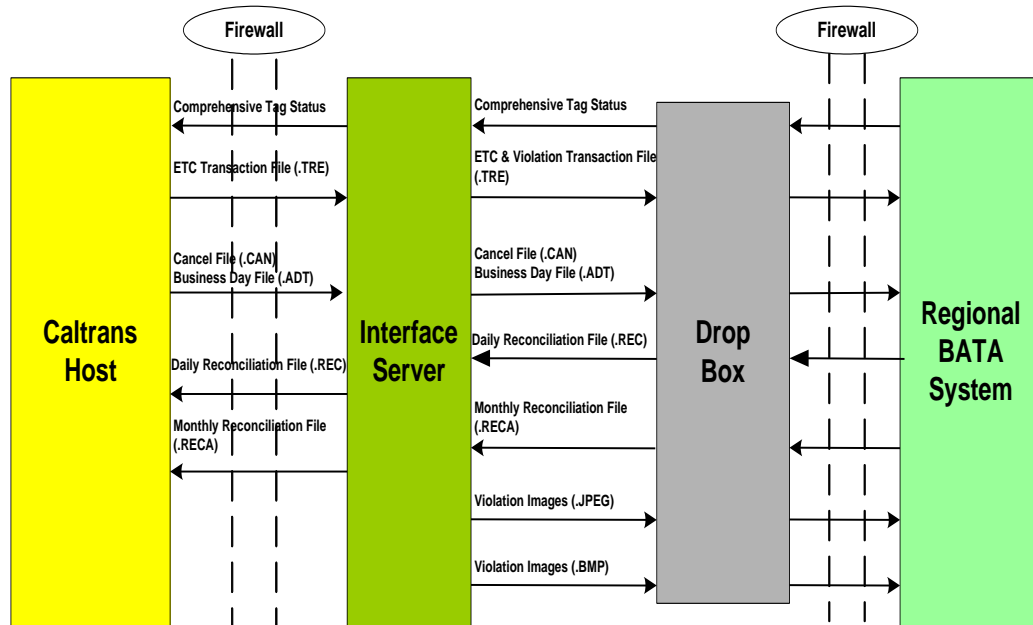
The CALTRANS toll agency consists of seven plazas Antioch, Richmond, Bay Bridge, San Mateo, Dumbarton, Carquinez and Benicia. Toll transactions, Violation transactions and Images are sent from the Lanes to the Plaza/Host in near real time. CALTRANS Host will interface with the BATA REGIONAL CSC using the Host / CSC Interfaces. The CALTRANS Host requires BATA REGIONAL CSC to comply with the Business Day concept and all its interfaces are very closely tied to business day. The Business Day is defined between 10:00 PM to 10:00 PM, however as described below, transactions are assigned to a business day by 'tours' and this may result in a transaction assigned to one business day when that transaction may have actually occurred in the previous or next business day.

BATA REGIONAL CSC will send a comprehensive tag status file as defined in Section 2 of the ICD. The tag status file will include all the tags in the system (Assigned or Unassigned to an Account). The Away agency tags will also be part of this comprehensive tag file.

CALTRANS Host will send all ETC transactions to the CSC in the ETC transaction File. The violation transactions shall be sent to the Interface Server. This Interface Server shall be sending the violation transactions in the ICD specified format, to the BATA CSC. The transaction files will be sent at regular intervals to the CSC for processing. Each transaction is associated with a TOUR. Tour is unique for a Collector, Plaza and Lane for a Business day. In the transaction files CSC can receive a regular transaction followed by cancel transaction. A cancel transaction is generated at the Plaza as a result of Toll Audit performed by Toll Collector. Every Cancel transaction results in reversing a posted transaction or ignoring transaction. Some Cancel transactions are generated at a later time and are sent in Cancel File. The Cancel file for a Business day will be sent at the end of Business day. All away agency transactions for a Business day should be sent only after receiving Cancel file as CTOC spec doesn't support corrections / reversal of a transaction.

**Table 3-1 The Interface flow between BATA Regional CSC and CALTRANS Host**

## Caltrans Transaction Flow

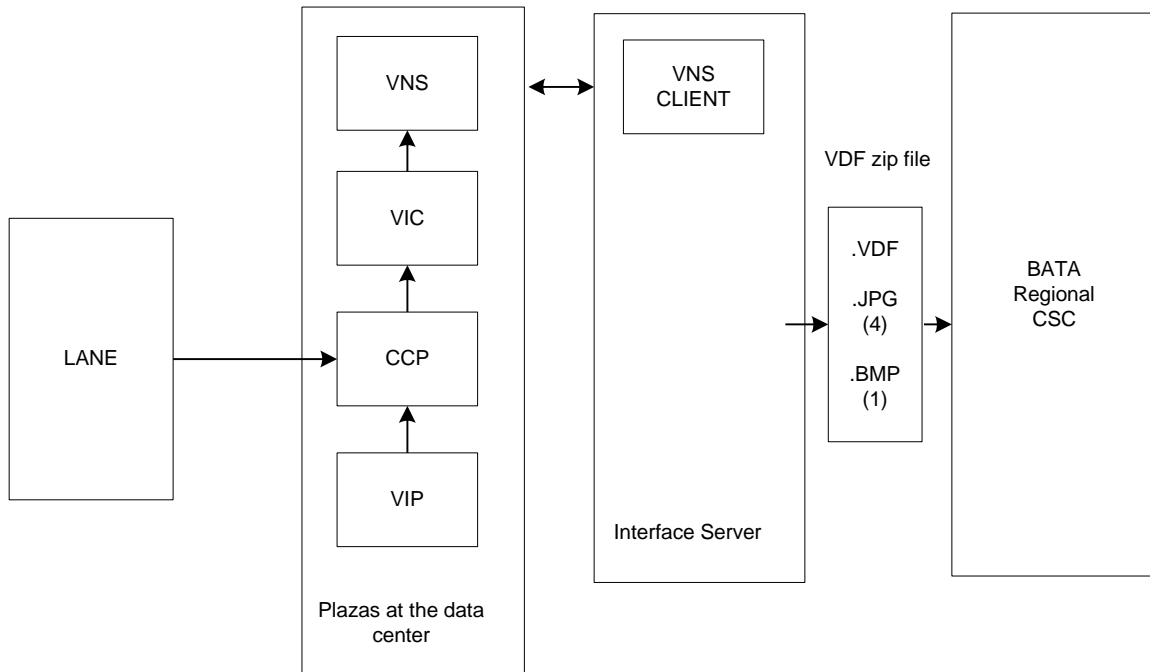


At the end of Business day, CALTRANS Host will send a Business day file containing a summary of transactions by tour id. This file will assign all tours to a Business day. Host generates Business day file upon receiving all transactions from the lanes. The BATA REGIONAL CSC will generate a Daily Reconciliation file, which will include all the tours, received for a Business day. Daily Reconciliation file will contain the summary of transaction count and amount by tour. The transactions received in a Cancel file will be excluded in the Business day file and Daily Reconciliation file. In the Daily Reconciliation file for all away transactions the amount will be the expected amount. The CSC business day shall be considered as “closed” only upon successful processing of the business day file on the CSC and the generation of the daily reconciliation files back to the CALTRANS Host.

For a calendar month, when Daily Reconciliation file has been sent for all the days, a monthly summary file is sent to the Host. This monthly summary file contains all the transaction count and associated amount for the complete month. Plaza, Revenue Month and AVC Class are used to summarize all the records in this file. The monthly summary file (RECA) shall contain the reconciliation summary of all ETC transactions (TOL\_MSG\_CMD = 330) only. The VECTOR CSC shall not create a RECB file at this time. There is no detailed transaction reconciliation between the BATA REGIONAL CSC and CALTRANS Host.

Violation Images will be transferred from the Lanes to Plaza using the existing interface. The VPC client who pulls the images from the Plaza will reside on the Interface Server. The Interface Server will convert the Violation data packet into Image files. The Interface Server will send all the matched images to the CSC on a regular interval for further processing. The image names will follow the Image Naming convention and Violation Image Data file will contain the Violation transaction and Image filenames.

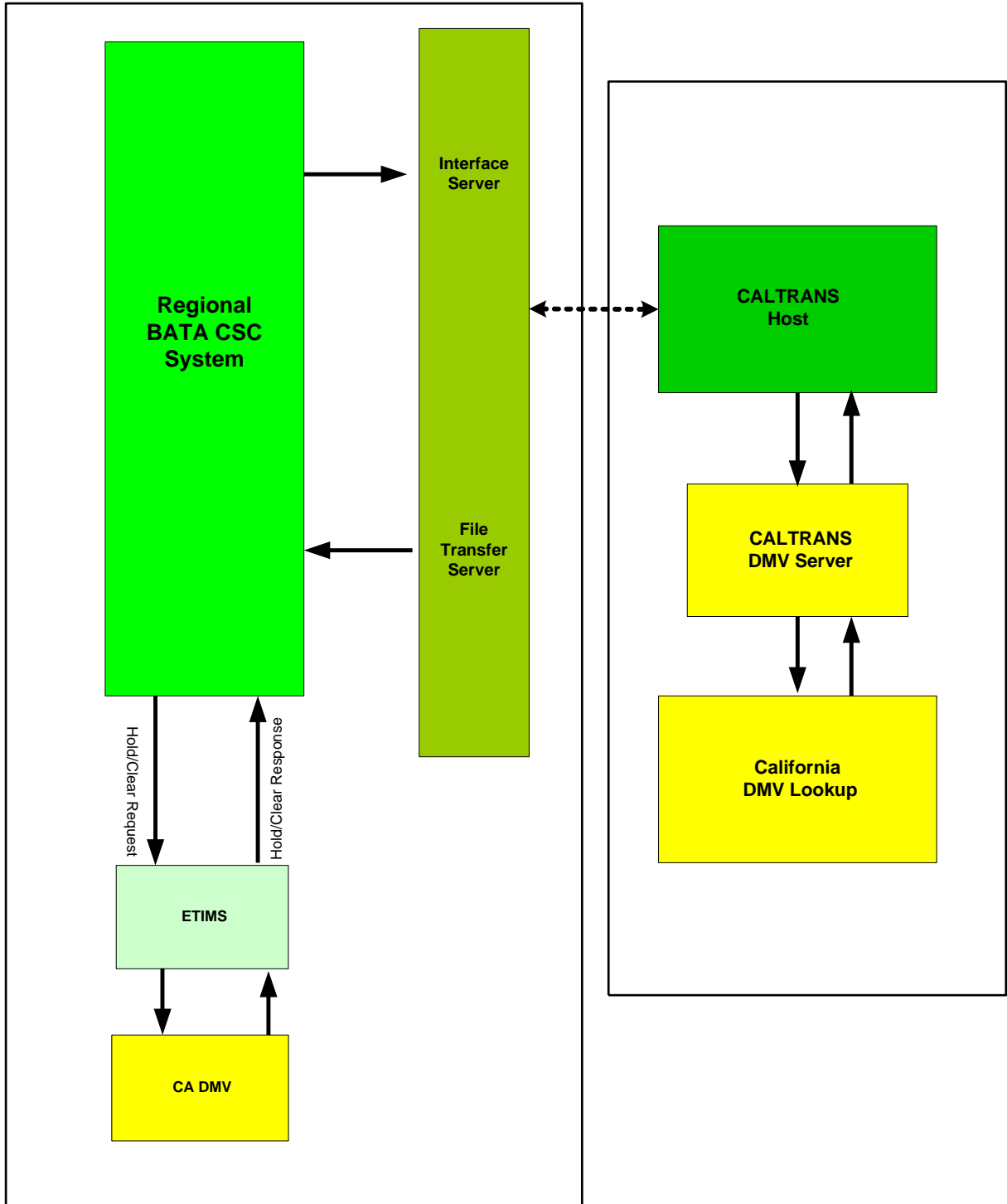
**Figure 3-2 CALTRANS image flow to BATA regional CSC**



BATA REGIONAL CSC will use the current DMV Interface between the CALTRANS CSC and California DMV. The DMV Request file will be sent from BATA REGIONAL CSC to the DMV server in the current Interface format. The CALTRANS Host shall send the DMV response file to the BATA REGIONAL CSC via the Interface Server and the file will follow the current DMV Response Interface format.

Figure 3-3 DMV lookup interface flow

### DMV File Flow

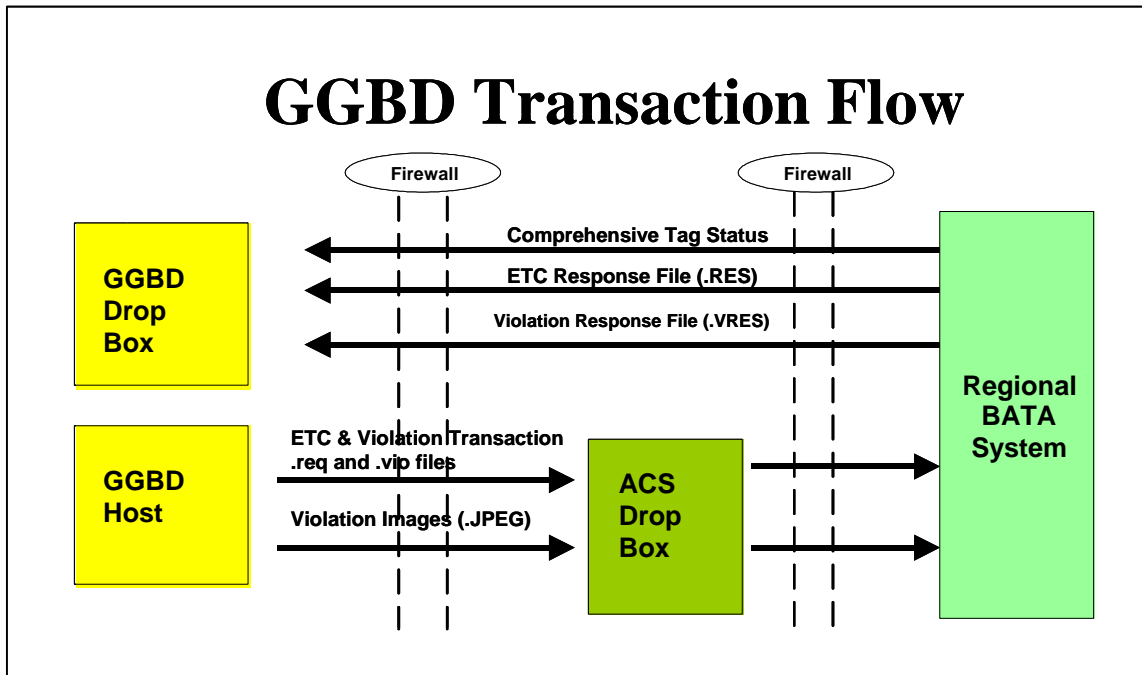


# 4. Transaction Interface – GGBD

The Golden Gate Bridge toll agency consists of one plaza Golden Gate Bridge Plaza. Toll transactions, violation transactions and images are sent from the Lanes to the Plaza/Host in near real time. Golden Gate Bridge Host will interface with the BATA REGIONAL CSC using the Host / CSC Interfaces.

BATA REGIONAL CSC will send comprehensive tag status files, as defined in Section 2 of the ICD, to the GGBD host. CSC will generate tag status file for CALTRANS tag range, GGBD tag range separately. Transmission from CSC to GGBD will include 1 CALTRANS, 1 GGBD and 1 file for each CTOC agency. All these individual files will be zipped in one file prior to sending to GGB. The tag status files will include all the tags in the system (Assigned or Unassigned to an Account). As the CSC will send the away tag status file for the GGB host, it (CSC) will be able to perform the required audit questions if and when tolls are disputed from the other agencies.

**Table 4-1 The Interface flow between BATA Regional CSC and Golden Gate Bridge Host**





GGBD Host will send all tagged transactions to the CSC in the ETC transaction file. The transaction files will be sent at regular intervals to the CSC for processing. Some the tagged transactions may also be violations. The CSC will respond to these transactions with an ETC Response file (RES) at regular intervals.

Those tagged violations that were paid-on-import will be identified and will not require any further processing by the CSC. Golden Gate Bridge Host will then send, once per day (Note: CSC is capable of processing multiple violation files within a day), all violation transactions to the CSC via the Violation Transaction file. Note that ALL violations, including those that do not require processing will be sent to the CSC. Violations that do not require processing will be reconciled immediately and included in CSC reports. Due to the fact that tagged violations are sent to the CSC twice (once in the ETC Transaction File and once in the Violation Transaction file) the Transaction number and the violation number will be switched for each violation transaction in the file to ensure that the CSC receives a unique transaction number for all transactions. Note that the range of violation numbers and transaction numbers do not overlap. Please refer to the section on General Transaction Processing rules for additional information.

Golden Gate Bridge Host will send all the violation images to the BATA REGIONAL CSC on a regular interval. Each transaction will have four jpeg images and violation data image file. The violation data image file will allow the Golden Gate Bridge Lane / Plaza to provide the OCR image output like license plate information, confidence level to the CSC. Note that the GGB does not currently use OCR and currently has no plans for its implementation.

The requirement from the Host to be able to request the current reconciliation status of already sent transaction will be met using the same interface with a different transaction type in the ETC transaction file layout. The ETC transaction file sequence number in its header will be used to check out of sequence files and in the event of receiving out of sequence file processing will continue but the file will be Acknowledged, as per the .ack file processing rules as defined in Section 10. CSC will be able to ignore the file with no-activity on the facility.

BATA REGIONAL CSC will use the CALTRANS DMV Interface for processing all the Golden Gate Bridge violation transactions requiring DMV plate lookup. The DMV Request file will be sent from BATA REGIONAL CSC to the DMV server in the current Interface format. The BATA REGIONAL CSC will pull the DMV Response file from the FTP Drop Box and the file will follow the current DMV Response Interface format.

## 5. Transaction Interface – CTOC – Interagency

---

The entire transaction Interface between BATA Regional CSC with the away agency will conform to CALIFORNIA TOLL OPERATOR COMMITTEE (“CTOC”) technical specification Revision G.3. There will be three away agencies San Diego (SNDG), SR-91 (SR91) and TCA (OTCA) and One Home Agency BATA Regional CSC.

Every day BATA Regional CSC will create and send a Tag Status file to each of the three away agencies and receive a tag status file from each of the three away agencies. The tag status file going to away agencies will be a comprehensive tag status file generated once a day and will include all of the home agency tags. There is no Acknowledgement file between the agencies and if a corrupt file is received it will be the responsibility of the receiving CSC to communicate to the sending agency on the next Business day. There is no provision for differential tag status file between the agencies.

BATA Regional CSC will create one tag status file containing tag ranges of both CALTRANS and Golden Gate Bridge. As the file naming convention and header requires a source agency, the current plan is to use “AT” CALTRANS agency code for sending tag status file.

There are two types of transaction files to support exchange of transaction information. All tagged transactions are sent in the Toll Charges file and all license plate transactions are sent in the Pay By Plate file. There are no transaction corrections supported between the agencies. Each agency has 14 days to reconcile transactions and all transactions older than 30 days require special processing by the receiving agency.

For all outbound transaction files, transactions from each plaza agency will be merged into one file. For e.g. All TCA customer transactions occurring on Golden Gate Bridge will be merged with TCA customer transactions occurring on CALTRANS plazas and sent to TCA in 1 file.

For all inbound transaction files BATA Regional CSC will be able to accept 1 merged file with Golden Gate Bridge tag ranges and CALTRANS tag ranges.

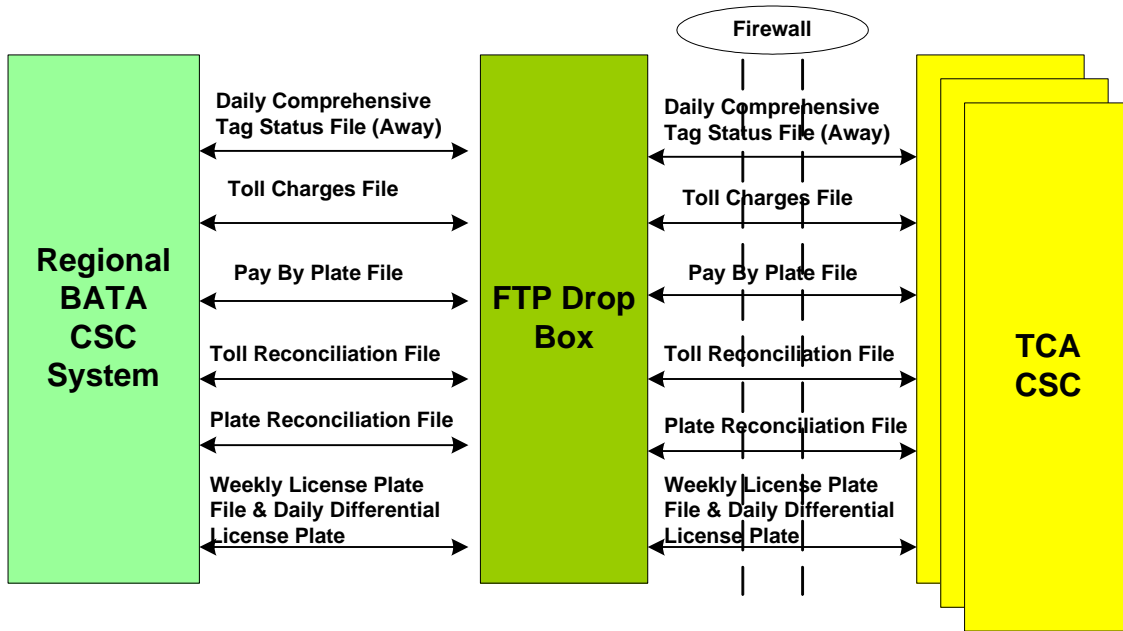
Reconciliation of transaction files is done at a file level containing the final disposition of each individual transaction. Each transaction reconciliation status will adhere to the CTOC Specification.

License Plate Status file is created to allow away agency to identify the CTOC customers. The file will contain all the valid customers’ license plate. Each agency on a weekly basis generates a comprehensive license plate file. CSC shall send the comprehensive plate file for CTOC agencies, no later than 1 am on Sundays. Delta License plate file since the last comprehensive file will be sent to away agency on a daily basis. The license plate additions and deletions are part of this file. Please refer to Appendix A of this document for CTOC specification files.



Figure 5-1 The Interface flow between BATA Regional CSC and Away agencies

# CTOC Transaction Flow



# 6. Tag Status File – GGBD

---

## 6.1. File type

Variable length, LF delimited

## 6.2. File name

<AGENCY\_CODE>\_YYYYMMDD\_HHMMSS.etc

Example: gg\_200304261\_00015.etc

Tag status file created at 10:00:15 on 04/26/2003

This file will be zipped (gg\_200304261\_00015\_etc.zip) and contain the following files –

Example:

gg\_20030426\_100001.etc

at\_20030426\_100002.etc

srat\_20041025\_030205.tag

tcat\_20030426\_100006.tag

cvat\_20030426\_100009.tag – (Not applicable as this is not a reciprocal

agency for tag file transfer.)

sdat\_20030426\_100013.tag

## 6.3. File use

The Tag Status File shall be created by the VECTOR CSC to inform the GGBD Host as to the status of each tag associated with an account held by BATA or CTOC customers. This file shall then be used by the GGBD Host to generate a tag status file for the GGBHTD lane.

CSC will generate tag status file for CALTRANS tag range, GGBD tag range separately.

Transmission from CSC to GGBD will include 1 CALTRANS, 1 GGBD, 1 each CTOC Tag File zipped as one file.

## 6.4. File layout

Each field in the header, detail and trailer structure will be separated with Delimiter “,” comma.

**Table 6-1 Tag Status File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“TAGS”



Field Name	Type/Size	Description/Valid Values
ACTION_CODE	CHAR (4)	“INIT”
SEQUENCE #	CHAR (6)	Sequence # of the Tag Status File. This number is incremented every day. Values 000000 – 999999 Sequence Number will be unique per agency file. Sequence number will be incremented every time a new file is generated for home tag ranges. For files received from away agency, the sequence number will be as received.
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
SOURCE	CHAR (2)	Indicates the file-creating agency. “at” for BATA (CALTRANS AND GGBD) and corresponding CTOC agency names for the CTOC files.
DESTINATION	CHAR (2)	Indicates the destination entity. “gg” for Golden Gate (for HOME tag files) and “at” for CTOC tag files
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
Header Total	<b>54</b>	

**Table 6-2 Tag Status File - Detail Structure**

Field Name	Type/Size	Description/Valid Values
ETC_TAG_ID	CHAR (8)	Tag Id in HEX Values: 00000000-0FEFF3FF
ACTION_CODE	CHAR (1)	Always “A”
TAG_TYPE	CHAR (1)	Values N – Non-Revenue, V – Valid, I – Invalid
SUBTYPE_1	CHAR (1)	Values N – Default, L – Lost, S – Stolen, B – Low balance, R – Not Used
SUBTYPE_2	CHAR (1)	N – Not Used
SUBTYPE_3	CHAR (1)	N – Not Used
LINEFEED	CHAR (1)	LF
Record Total	<b>14</b>	

**Table 6-3 Tag Status File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	“#TRAILER”
SEQUENCE #	CHAR (6)	Same as Header
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
LINEFEED	CHAR (1)	LF
Record Total	<b>33</b>	

## 6.5. Processing requirements

1. The VECTOR CSC shall complete the transmission of the comprehensive tag status file to the GGBD Host drop-box as defined in Section 2 of the ICD.



2. In the event that an invalid header record is encountered (e.g., character data in a numeric field, etc.), the GGBD Host shall reject the file and notify the VECTOR CSC via the Acknowledgement File defined in Section 10 of this document.
3. The RCSC will send one zipped tag status file to GGB. The zipped file will contain seven separate files (AT; GG; TCA; SNDG; SR91; SENTRI and CTV). If any of the seven individual files received are bad, GGB Host will send ACK file to the RCSC with a status of 01. GGB Host will make an attempt to process any of the individual valid files and download to the lanes as per their current processing rules. In the case of a BAD CTOC file, the GGB Host will use their existing mechanism of using the latest CTOC Tag file and ignoring the BAD CTOC file. RCSC will log the problem upon receiving the ACK file (01) from the GGB Host. Upon received notification of an ACK file with a status of 01, the ACS System Admin will log and escalate the issue. They contact the GGB System Admin for detailed information. Once a decision has been reached appropriate action will be taken.
4. In the event that an invalid detail record is encountered (e.g., inappropriate TAG\_STATUS, etc.), the GGBD Host shall skip the complete file and notify the VECTOR CSC via the Acknowledgement File. Please refer to Appendix C for processing rules on error data in files.
5. The GGBD Host shall perform the appropriate sanity checks on the Tag Status File prior to its transmission to the lanes. Such sanity checks should include, but not be limited to:
  - Unusual growth in the number of tags from previous version
  - Unusual change in number of tags with a particular tag status
6. One form of validation by the Host could be an upper limit of 10% increase and a lower limit of 2%, as compared to previous file. This check can be lifted on notification from CSC. This can happen if the CSC receives large Tag Inventory. As per the current Business Rules, there is no reason for Tag Status file to decrease in size when compared to previous file. GGBD will perform this check on each individual file (CALTRANS range, GGBD range and on each CTOC agency files).

**Table 6-4 Valid Tag Status Values for GGBD Host**

Item #	Tag Status	Account Status	Financial Status	Discount Plan	Regional - CSC GGBD Tag Type	Regional - CSC GGBD Sub Type 1
1	INVENTORY	N/A	N/A	N/A	I	N
2	RETURNED	N/A	N/A	N/A	I	N
3	DAMAGED	N/A	N/A	N/A	I	N
4	RETURNDEF	N/A	N/A	N/A	I	N
5	SHIPVEND	N/A	N/A	N/A	I	N
6	TESTED	N/A	N/A	N/A	I	N
7	EXPIRED	N/A	N/A	N/A	I	N
8	LOST	Active	N/A	N/A	I	L
9	STOLEN	Active	N/A	N/A	I	S
10	ACTIVE	Active	Good Balance	Standard	V	N
11	ACTIVE	Active	Low Balance (Cash/Check)	Standard	V	B
12	ACTIVE	Active	Zero Balance (Cash/Check)	Standard	I	B



Item #	Tag Status	Account Status	Financial Status	Discount Plan	Regional - CSC GGBD Tag Type	Regional - CSC GGBD Sub Type 1
13	ACTIVE	Active	Revoked Warning (Cash/Check)	Standard	I	B
14	ACTIVE	Active	Good Balance	Non Revenue	N	N
15	ACTIVE	Active	Low Balance (Cash/Check)	Non Revenue	N	N
16	ACTIVE	Active	Zero Balance (Cash/Check)	Non Revenue	N	N
17	ACTIVE	Active	Revoked Warning (Cash/Check)	Non Revenue	N	N
18	N/A	Closed Pending	N/A	N/A	I	N

**Table 6-5 CTOC Tag Status Mapping Values for GGBD Host**

Item #	CTOC Tag Type	CTOC Sub Type 1	Regional - CSC GGBD Tag Type	Regional - CSC GGBD Sub Type 1
1	N – Non Revenue (Universal to all entities)	N – Not Used	N – Non Revenue	N
2	V – Valid	N – Not Used	V – Valid	N
3	I - Invalid	N – Not Used	I – Invalid	N

## 6.6. Sample files

CALTRANS Tag File for GGB Lanes

at\_20040508\_100002.etc

```
#HEADER,TAGS,INIT,000967,05/08/2004,at,gg,05/08/2004,22:45:03
0FE00001,A,V,N,R,R
0FE00006,A,V,N,R,R
0FE00008,A,V,N,R,R
0FE0000A,A,I,L,R,R
.
.
#TRAILER,000967,05/08/2004,00315464
```

SR-91 Tag File for GGB Lanes

srat\_20041025\_030205.tag

```
#HEADER,TAGS,INIT,000907,05/08/2004,sr,at,05/08/2004,22:45:03
08100000,A,V,N,N,N
08100001,A,V,N,N,N
08100002,A,V,N,N,N
```



08100003,A,V,N,N,N

.

.

#TRAILER,000907,05/08/2004,00315464

# 7. ETC Transaction File – GGBD

---

## 7.1. File type

Variable length, LF delimited

## 7.2. File name

YYYYMMDDHHMMSS.REQ

Example:                   20020928044100.req  
                               GGBD transactions to VECTOR CSC created at 04:41:00 on 09/28/02

## 7.3. File use

The Transaction File shall be created by the GGBD Host to inform the VECTOR CSC of all toll transactions occurring at CALTRANS lanes. This file shall contain tagged transactions on GGBD lanes due to BATA customers or CTOC customers with both valid and invalid statuses.

## 7.4. File layout

Each field in the header, detail and trailer structure will be separated with Delimiter “,” comma.

**Figure 7-1 ETC Transaction File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“REQ ”
SEQUENCE #	CHAR (6)	Sequence # of the Transaction File. This unique number is incremented for every file. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	This field will be populated with the transaction date of the first transaction in the file. Format MM/DD/YYYY
SOURCE	CHAR (2)	Indicates the file-creating agency. “GG” for Golden Gate
DESTINATION	CHAR (2)	Indicates the destination entity. “AT” for BATA
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	

Figure 7-2 ETC Transaction File – Detail Structure

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	Unique transaction number for each ETC transaction. Used to identify the transaction in the ETC reconciliation process. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Type of transaction. 1 – ETC. 3 – Request Status. 4 – Carpool.
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143
TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = “GGB”
TOL_LANE_ID	CHAR (2)	The lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
TOL_TRX_DATE	CHAR (10)	The date of the occurrence of the transaction at TOL_LANE_ID. Format: MM/DD/YYYY. This toll transaction date information shall be shown on customer statements.
TOL_TRX_TIME	CHAR (8)	The time of the occurrence of the transaction at TOL_LANE_ID. Format: HH:MM:SS. This toll transaction time information shall be shown on customer statements.
TOL_FARE_ETC_AMT	CHAR (5,2)	The toll due as calculated by the GGBD Lane / Host. This is the amount to be posted to the ETC home or away account, posting by Tag or Plate. Values: 00000 (\$000.00) – 99999 (\$999.99)
TOL_FARE_CASH_AMT	CHAR (5,2)	The toll due as calculated by the GGBD Lane / Host. Values: Always 00000
TOL_MSG_FLAG	CHAR (2)	The message buffer status flag. This field indicates whether or not a transaction was buffered. Values: 00-99. 1 – Toll packet transaction. 2 – Buffered tag transaction
TOL_AVC_CLASS	CHAR (2)	The class of the vehicle involved in the transaction. This field shall contain AVC class or as overridden by the collector classification. Values: Default 02
LANE_TX_SEQUENCE_NUMBER	CHAR (8)	The unique vehicle transaction sequence number generated by lane (Lane sequence number). Values:00000000 – 99999999
TOL_TAG_STATUS	CHAR (1)	The status of the tag at the time of the transaction. Values: 0 – 9 0 - Invalid 1 – Good 2 – Lost 3 – Stolen 4 – Low Balance 8 – Non-revenue vehicle (NRV)
TOL_DST_FLAG	CHAR (1)	The daylight savings time. The contents of this field shall be used to govern certain processing rules at the VECTOR CSC This field will always default to asterisk (*)



Field Name	Type/Size	Description/Valid Values
TOL_TRX_SPEED	CHAR (3)	The transaction speed as reported by the lane. Values 000 – 999
VIOL_NUMBER/ORIG_TRX_NUMBER	CHAR (10)	For an ETC transaction that is also a violation, this is the unique violation number. For a violation transaction, this will hold the original transaction number. For ETC transactions this field will contain 0000000000
RESOLV_CODE	CHAR (2)	For ETC transactions this field will contain 00 The code established for a violation transaction following ETC posting and review audit review. CSC will process only code '02' violations. If ACS receives revenue audit reject transactions from GGBD (field indicator RESOLVE_CODE will be used) the transaction will reconciled back to GGBD as Authority reject status (92). The codes the CSC will receive are: 02 – violation that needs to be processed at the CSC  All the following are write-off codes, except 98 which is an ETC violation that was paid via the ETC Interface  90 – equipment problems 91 – when light curtain breaks, and this violation is a trailer 92 – miscellaneous write-off – documented and tracked by Revenue Audit 93 – vehicle backed up 94 – non revenue violator/CHP as documented by Bridge Officer during tour 95 – late commit carpool as documented by Bridge Officer during tour 96 – late commit cash paid as documented by Bridge Officer during tour 97 – late commit handicap, or disabled card that did not read as document by Bridge Officer 98- Paid on Import (via the ETC Interface) 99 – miscellaneous write-off – reported by Bridge Officer, documented and tracked by Revenue Audit
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>84</b>	

**Figure 7-3 ETC Transaction File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	"#TRAILER"
SEQUENCE #	CHAR (6)	Same as Header
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
DETAIL_TRANS_AMOUNT	CHAR (10)	Total Amount of the Amount Due field for all the transactions in the file
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>43</b>	

## 7.5. Processing requirements

1. The VECTOR CSC shall receive and process ETC Transaction Files from the GGB Host multiple times a day at predetermined intervals (viz. every 0.5hrs, 1hr etc to be determined later).
2. Please refer to Appendix D for all transaction-processing rules.
3. ETC transactions in this file will have a unique transaction number for each record in the file.
4. All transactions coming in this interface will be processed and the resolve code values will be ignored.
5. Vector CSC can process multiple tol\_trx\_type in a single file. For TOL\_TRX\_TYPE = 3, ACS will return exactly the same response information as was returned to the GGB Host when this transaction was originally processed. The TOL\_TRX\_TYPE = 3 transactions can be requested up to 6 months after the original transaction was processed. ACSs' understanding of TOL\_TRX\_TYPE = 3 is that this type of request will come to CSC in the event the Reconciliation file is missed or failed to be applied at the Host.
6. The VECTOR CSC shall ensure upon processing that the ETC Transaction File does not contain two (or more) transactions for the same TOL\_TAG\_ID/TOL\_TAG\_AGENCY\_ID combination in the same TOL\_PLAZA\_ID/TOL\_LANE\_ID within a one (1) minute period. However, this parameter shall be configurable at the VECTOR CSC based on business rule decisions between the VECTOR CSC and GGB Host.
7. The VECTOR CSC shall perform sanity checks on the ETC Transaction File to look for formatting errors, record count mismatch between header and detail records etc. In the event the file fails on these sanity checks, the VECTOR CSC shall notify the GGB Host of the anomaly by means of the acknowledgment file.
8. If the VECTOR CSC determines an error in a detail record, the VECTOR CSC shall reject the transaction record with the error and process the remainder of the transaction file and notify the GGB Host of the error via the acknowledgment file. The ACK file shall have a corresponding error code indicative of the error.
9. The VECTOR CSC shall not compute toll amounts for normal ETC transactions received from the GGB Host. The toll amount calculated at the GGB Host as supplied in the TOL\_FARE\_ETC\_AMT field of the transaction file shall be used to debit the BATA Regional CSC accounts. This shall include transactions due to non-revenue customers also (since GGB Host would send 00000 in the TOL\_FARE\_ETC\_AMT field).
10. VECTOR has the capability of rejecting transaction based on the age of the transaction. VECTOR will set 180 days for all incoming transactions from Away Agency (TCA, SR91 or SNDG) and 365 days for all incoming transactions from Home Agencies (CALTRANS and GGBD). This value can be changed on BATA direction.
11. The VECTOR CSC shall first check its own customer base to see if the transaction can be applied to one of its own accounts before including the transaction in a Transaction File destined for another CTOC agency.
12. TOLL\_DST\_FLAG is not part of the unique key for toll transactions and there shall not be any duplicate values as a result of asterisks (\*). Added to ICD 1.4.1
13. ACS will calculate the Business Date based on 10:00 pm to 10:00 pm time range as follows.



Case 1: Tx Date - 4/5, Tx Time - 13:00 hrs => Revenue Date = 4/5

Case 2: Tx Date - 4/5, Tx Time - 23:00 hrs => Revenue Date = 4/6

Case 3: Tx Date - 4/5, Tx Time - 22:00 hrs => Revenue Date = 4/6

## 7.6. Sample file

20040202222030.req

```
#HEADER,REQ ,000001,02/02/2004,GG,AT,02/02/2004,22:20:30
0000001234,1,1022,133015,GGB ,01,02/02/2004,19:20:30,00350,00000,01,02,00001234,1,* ,005,0000000000,00
0000001234,1,0002,133015,GGB ,02,02/02/2004,19:21:10,00450,00000,01,02,00012340,1,* ,015,0000000000,00
0000001234,1,0099,133015,GGB ,03,02/02/2004,19:22:20,00350,00000,01,02,00011264,1,* ,018,0000000000,00
0000001234,1,1000,133015,GGB ,04,02/02/2004,19:23:30,00300,00000,01,02,00011434,1,* ,020,0000000000,00
0000001234,1,0012,133015,GGB ,05,02/02/2004,19:23:30,00550,00000,01,02,00041434,1,* ,005,0000000000,00
#TRAILER,000001,02/02/2004,00000005,0000002000
```

# 8. ETC Response File – GGBD

---

## 8.1. File type

Variable length, LF delimited

## 8.2. File name

YYYYMMDDHHMMSS.RES

Example: 20020928044100.res      Created at 04:41:00 on 09/28/02  
Transaction Reconciliation file from VECTOR CSC to GGBD Host

## 8.3. File use

The VECTOR CSC shall create an ETC Response File back to the GGBD Host, for each transaction (.req) files received.

## 8.4. File layout

Each field in the header, detail and trailer structure will be separated with delimiter “,” comma.

**Figure 8-1 ETC Response File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“RES ”
SEQUENCE #	CHAR (6)	Sequence # of the original Transaction File. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	The date send in the .req header record, in the BUSINESS_DATE column, will be sent back in this field.
SOURCE	CHAR (2)	Indicates the destination entity. “AT” for BATA
DESTINATION	CHAR (2)	Indicates the file-creating agency. “GG” for Golden Gate
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	

Figure 8-2 ETC Response File – Detail Structure

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	Unique transaction number for which this record is response. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Response for the type of transaction received by CSC. 1 – ETC 3 – Request 4 – Carpool
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143
TOL_POSTED_DATE	CHAR (10)	This is the Date the transaction was processed (Posted or Rejected) on the CSC / Away Agency. Format: MM/DD/YYYY
TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = “GGB”
TOL_LANE_ID	CHAR (2)	The lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
TOL_FARE_POSTED_AMOUNT	CHAR (5,2)	This is the amount posted to the ETC home or away account, posting by Tag or Plate. Values: 00000 (\$000.00) – 99999 (\$999.99)
NON_REVENUE_FLAG	CHAR (2)	This field indicates if the transaction was posted against Non-Revenue account. Values: 00 – Default Value 01 – Non Revenue Account
PAYMENT_TYPE	CHAR (1)	A – Toll posted successfully to ETC account. V – Toll marked by the lane as a Violation and did not post to a CSC account E – An Exception occurred while trying to post this toll.
CSC_REASON_CODE	CHAR (3)	Reason toll was not posted. CSC generates this code from its own internal processing and it is sent to the GGBD Plaza Host for reference. Values 000 – 999. A detailed listing of the various reason codes is provided in Appendix B.
BUSINESS_DATE	CHAR (10)	The actual business date of the transaction. This field would identify the revenue date of the transaction. Format: MM/DD/YYYY
CSC_BATCH	CHAR (10)	This will be used to reconcile CSC and GGBD Plaza Host revenue numbers. This field will contain the original file id (extern_file_id), to map the file in which this transaction was received at the CSC. The contents of this field shall be left padded with zeros. Values: 0000000000 – 9999999999
CSC_ACCT_NO	CHAR (16)	VECTOR CSC account number assigned to BATA customers. For CTOC customers, the following is a static value for each agency 0000000000000098 - SR 91 0000000000000097 - SANDAG 0000000000000096 - TCA 0000000000000095 - CTV 0000000000000094 - SENTRY



Field Name	Type/Size	Description/Valid Values
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>84</b>	

**Figure 8-3 ETC Response File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	"#TRAILER"
SEQUENCE #	CHAR (6)	Same as Header
FILE_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>33</b>	

## 8.5. Processing requirements

1. All transactions received at the VECTOR CSC, via the ETC Transaction File, shall be sent back to the GGB Host in the reconciliation file.
2. All regular transactions TOL\_TRX\_TYPE = 1 (ETC) received by the CSC, will be reconciled back with final status code. The reconciliation will be at file level. Example CSC receives 100 transactions in file 123, same 100 transactions will be reconciled back to GGBD in one file, no less than once a day.
3. The CSC will produce reconciliation within 9 hours of receipt of transaction file and will produce reconciliation files by 10am each day for the previous day's files.
4. CSC will always look for unique TRANSACTION\_NUMBER and cannot maintain relationship between Violation Number and Original Transaction Number.
5. The VECTOR CSC shall perform transaction reconciliation at a detail level. i.e. the reconciliation file shall contain details at the transaction level instead of a reconciliation summary.
6. The VECTOR CSC will reconcile all Away Transactions with Expected Revenue and not wait for reconciliation file from Away Agency. However in the event the transactions are rejected by the Away agency due to any reasons, the revenue delta will be reflected through Reports.
7. In cases when a transaction cannot be posted at the VECTOR CSC, the VECTOR CSC shall indicate the reason, the transaction was not posted in the CSC\_REASON\_CODE field. The possible reason codes and the description are provided in Appendix B.
8. The VECTOR CSC shall assign a unique integer value to all incoming transaction files from the GGB Host. This unique identifier shall be sent as part of the reconciliation file to the GGB Host for all transactions posted and reconciled against a particular agency. The unique identifier shall be specified in the CSC\_BATCH field of the reconciliation file.



9. Vector CSC can process multiple tol\_trx\_type in a single file. For TOL\_TRX\_TYPE = 3, ACS will return exactly the same response information as was returned to the GGB Host when this transaction was originally processed. The TOL\_TRX\_TYPE = 3 transactions can be requested up to 6 months after the original transaction was processed. ACS understanding of TOL\_TRX\_TYPE = 3 is that this type of request will come to CSC in the event the Reconciliation file is missed or failed to be applied at the Host.
10. The time frame for the GGBD host, in order to initiate such a request (tol\_trx\_type = 3) will be 6 months.
11. The Response file will contain the initial reconciliation code (for Home agencies) and the 'posted' reconciliation code for CTOC agencies. In case there is no data available for the requested transaction, a code of 'Not Found' will be sent back to the GGB host.
12. The field called CSC\_ACCT\_NO was added to the interface, solely for the convenience of GGBD. However, any analysis or research needs involving account numbers shall only be obtained through the CSC Host.
13. The VECTOR CSC shall use the toll amount as supplied in the TOL\_FARE\_CASH\_AMT field to process violations. All postable transactions shall use the amount in the TOL\_FARE\_ETC\_AMT field, while transactions that are eligible for notice escalation shall use the amount in the TOL\_FARE\_CASH\_AMT field.
14. The GGB Host will periodically generate and transmit ETC and VIO files to the CSC. GGB will periodically poll the area ACK files are transferred to the Host by the CSC. When an ACK file is received the GGB database will be updated. If the ACK file shows a FAILURE code the GGB Host will regenerate and resend the original file. A failure count will be maintained and after 3 concurrent failures of a single file an email will be sent to the GGB System Operators.
15. If an ACK file is not received within 2 hours of an ETC or VIO file being transmitted to the CSC an email will be generated to the CSC and GGB System Operators. Another email will be sent every 2 hours to a designated list escalating the issue until the situation is resolved.
16. A recon file should be received within 9 hours of an ETC or VIO Transaction file being transmitted to the CSC and no later than 10 am for the previous day's files.
17. GGB will periodically poll the area recon files are transferred to the Host by the CSC. When a new file is received GGB will load the file and perform certain validations. In all cases the GGB Host will generate an ACK file and transmit this back to the CSC. The ACK file will contain a SUCCESS code (value 0) if the recon file passed validation and was sent to the lanes or a FAILURE code (value 01) if the recon file failed validation.
18. A recon file will always be ACKED with a FAILURE code if it is received before the ACK file for the corresponding ETC or Violation Transaction File. If a recon file is not received within 9 hours or by 10 am for the previous day's files, the GGB Host will automatically send an email to the CSC and GGB Sysops stating the "recon file is late or missing". This check will be repeated every 2 hours and an email will be sent to a designated list escalating the issue until the situation is resolved.



## 8.6. Sample File

20040203043030.res

```
#HEADER,RES ,000001,02/02/2004,AT,GG,02/03/2004,043030  
0000000789,1,1022,133015,02/03/2004,GGB,01,00350,00,1,000,02/02/2004,0012300443, 0000000000115678  
0000000790,1,0002,133015,02/03/2004,GGB,02,00450,00,1,000,02/02/2004,0012300443, 0000000000118907  
0000000791,1,0099,133015,02/03/2004,GGB,03,00350,00,1,000,02/02/2004,0012300443, 0000000000147988  
0000000792,1,1000,133015,02/03/2004,GGB,04,00300,00,1,000,02/02/2004,0012300443, 0000000000100964  
0000000793,1,0012,133015,02/03/2004,GGB,05,00550,00,1,000,02/02/2004,0012300443, 0000000000135475  
#TRAILER,000001,02/03/2004,00000005
```



# 9. Violations Transaction File - GGBD

---

## 9.1. File type

Variable length, LF delimited

## 9.2. File name

YYYYMMDDHHMMSS.VIO

Example: 20020928044100.vio  
 GGBD violation transactions to VECTOR CSC created at 04:41:00 on 09/28/02

## 9.3. File use

The violation Transaction File shall be created by the GGBD Host to inform the VECTOR CSC of all violation transactions, including all violations transactions that the CSC will not process (e.g. paid-on-import), occurring at GGBD lanes. This file will be in the same format as that of the ETC Transaction File for GGBD

All violation transactions, including, those written off by GGB (resolve\_code 92) and those paid-on-import (resolve\_code 98) through the ETC interface, may be received at the CSC in this interface. The CSC will ignore all transactions (which have a resolve code between 90 and 99) and return a csc\_reason\_code of 'Authority Reject' in the reconciliation file.

## 9.4. File layout

Each field in the header, detail and trailer structure will be separated with Delimiter “,” comma.

**Figure 9-1 Violation Transaction File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“VIO ”
SEQUENCE #	CHAR (6)	Sequence # of the violation transaction File. This unique number is incremented for every file. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	This field will be populated with the transaction date of the first transaction in the file.



Field Name	Type/Size	Description/Valid Values
		Format MM/DD/YYYY
SOURCE	CHAR (2)	Indicates the file-creating agency. "GG" for
DESTINATION	CHAR (2)	Indicates the destination entity. "AT" for BATA
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	

**Figure 9-2 Violation Transaction File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	Unique violation transaction number for each transaction. Used to identify the violation transaction in the reconciliation process. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Type of transaction. 2 – Violation
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023 Default this field to asterisks (*) for all violations with no tag reads.
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143 Default this field to asterisks (*) for all violations with no tag reads.
TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = "GGB"
TOL_LANE_ID	CHAR (2)	The lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
TOL_TRX_DATE	CHAR (10)	The date of the occurrence of the transaction at TOL_LANE_ID. Format: MM/DD/YYYY. This toll transaction date information shall be shown on customer statements.
TOL_TRX_TIME	CHAR (8)	The time of the occurrence of the transaction at TOL_LANE_ID. Format: HH:MM:SS. This toll transaction time information shall be shown on customer statements.
TOL_FARE_ETC_AMT	CHAR (5,2)	The toll due as calculated by the GGBD Lane / Host. This is the amount to be posted to the ETC home or away account, posting by Tag or Plate. Values: 00000 (\$000.00) – 99999 (\$999.99)
TOL_FARE_CASH_AMT	CHAR (5,2)	The toll due as calculated by the GGBD Lane / Host. This amount should be used for Violation Notices. This amount includes only the toll amount. The fee/penalty shall be calculated at the VECTOR CSC during processing Values: 00000 (\$000.00) – 99999 (\$999.99)
TOL_MSG_FLAG	CHAR (2)	The message buffer status flag. This field indicates whether or not a transaction was buffered. Values: 00-99. 1 – Toll packet transaction. 2 – Buffered tag transaction



Field Name	Type/Size	Description/Valid Values
TOL_AVC_CLASS	CHAR (2)	The class of the vehicle involved in the transaction. This field shall contain AVC class or as overridden by the collector classification.
LANE_TX_SEQUENCE_NUMBER	CHAR (8)	The unique vehicle transaction sequence number generated by lane (Lane sequence number). Values:00000000 – 99999999
TOL_TAG_STATUS	CHAR (1)	The status of the tag at the time of the transaction. Values: 0 – 9 0 - Invalid 1 – Good 2 – Lost 3 – Stolen 4 – Low Balance 8 – Non-revenue vehicle (NRV)
TOL_DST_FLAG	CHAR (1)	The daylight savings time. The contents of this field shall be used to govern certain processing rules at the VECTOR CSC
TOL_TRX_SPEED	CHAR (3)	The transaction speed as reported by the lane. Values 000 – 999
VIOL_NUMBER/ORIG_TRX_NUMBER	CHAR (10)	For a violation transaction, this will hold the original transaction number.
RESOLV_CODE	CHAR (2)	The code established for a violation transaction following ETC posting and review audit review. CSC will process only code '02' violations. The codes the CSC will receive are: 02 – violation that needs to be processed at the CSC The CSC shall respond to the GGB Host with a resolve code of 92 (as GGB's equivalent for Authority Rejects)  The CSC shall respond to the GGB Host with a resolve code of 98 for all transactions posted (paid on import)  All the following are write-off codes, except 98 which is an ETC violation that was paid via the ETC Interface  90 – equipment problems 91 – when light curtain breaks, and this violation is a trailer 92 – miscellaneous write-off – documented and tracked by Revenue Audit 93 – vehicle backed up 94 – non revenue violator/CHP as documented by Bridge Officer during tour 95 – late commit carpool as documented by Bridge Officer during tour 96 – late commit cash paid as documented by Bridge Officer during tour 97 – late commit handicap, or disabled card that did not read as document by Bridge Officer 98- Paid on Import (via the ETC Interface) 99 – miscellaneous write-off – reported by Bridge Officer, documented and tracked by Revenue Audit
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>84</b>	



**Figure 9-3 Violation Transaction File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	"#TRAILER"
SEQUENCE #	CHAR (6)	Same as Header
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
DETAIL_TRANS_AMOUNT	CHAR (10)	Total Amount of the Amount Due field for all the transactions in the file
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>43</b>	

## 9.5. Processing requirements

1. The VECTOR CSC is capable of receiving and processing Violation Transaction Files from the GGB Host multiple times a day.
2. Violation transactions in this file will have a unique transaction number for each record in the file. GGBD Host would replace the transaction\_number with the violation\_number, prior to sending the transaction to the CSC.
3. CSC will always look for unique TRANSACTION\_NUMBER and will not maintain relationship between Violation Number and Original Transaction Number.
4. The VECTOR CSC shall perform sanity checks on the Violation Transaction File to look for formatting errors, record count mismatch between header and detail records etc. In the event the file fails on these sanity checks, the VECTOR CSC shall notify the GGB Host of the anomaly by means of the acknowledgment file.
5. If the VECTOR CSC determines an error in a detail record, the VECTOR CSC shall reject the transaction record with the error and process the remainder of the transaction file and notify the GGB Host of the error via the acknowledgment file. The ACK file shall have a corresponding error code indicative of the error.
6. The VECTOR CSC shall use the toll amount as supplied in the TOL\_FARE\_CASH\_AMT field to process violations. All postable transactions shall use the amount in the TOL\_FARE\_ETC\_AMT field, while transactions that are eligible for notice escalation shall use the amount in the TOL\_FARE\_CASH\_AMT field.
7. VECTOR has the capability of rejecting transaction based on the age of the transaction. VECTOR will set 180 days for all incoming transactions from Away Agency (TCA, SR91 or SNDG) and 365 days for all incoming transactions from Home Agencies (CALTRANS and GGBD). This value can be changed on BATA direction.
8. ACS will calculate the Business Date based on 10:00 pm to 10:00 pm time range as follows.  
 Case 1: Tx Date - 4/5, Tx Time - 13:00 hrs => Revenue Date = 4/5  
 Case 2: Tx Date - 4/5, Tx Time - 23:00 hrs => Revenue Date = 4/6  
 Case 3: Tx Date - 4/5, Tx Time - 22:00 hrs => Revenue Date = 4/6



## 9.6. Sample File

20040202224030.vio

```
#HEADER,VIO ,000001,02/02/2004,GG,AT,02/02/2004,22:40:30
0000002556,2,* ,* ,GGB,01,02/02/2004,10:13:30,00350,00350,01,02,00005697,0,* ,015,0074568464,02
0000002557,2,* ,* ,GGB,02,02/02/2004,12:56:10,00450,00450,01,02,00059624,0,* ,005,0098573645,02
0000002558,2,* ,* ,GGB,03,02/02/2004,13:46:20,00350,00350,01,02,00012856,0,* ,020,0009586867,02
0000002559,2,* ,* ,GGB,04,02/02/2004,15:23:30,00300,00300,01,02,00097843,0,* ,014,0000036455,02
0000002560,2,* ,* ,GGB,05,02/02/2004,19:19:19,00550,00550,01,02,00069568,0,* ,012,0000045756,02
#TRAILER,000001,02/02/2004,00000005,0000002000
```

# 10. Violation Reconciliation File – GGBD

---

## 10.1. File type

Variable length, LF delimited

## 10.2. File name

YYYYMMDDHHMMSS.VRES

Example: 20020928044100.vres      Created at 04:41:00 on 09/28/02  
Violation Reconciliation file from VECTOR CSC to GGBD Host

## 10.3. File use

The VECTOR CSC shall create a Violation Response File back to the GGBD Host, by business day indicating the transactions within different hours. This file shall be used to send final and interim status on violation transactions.

## 10.4. File layout

Each field in the header, detail and trailer structure will be separated with delimiter “,” comma.

**Figure 10-1 Violation Response File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“VRES ”
SEQUENCE #	CHAR (6)	Sequence # of the original violation transaction File. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	The date send in the .vio header record, in the BUINESS_DATE column, will be sent back in this field.
SOURCE	CHAR (2)	Indicates the file-creating agency. “AT” for BATA
DESTINATION	CHAR (2)	Indicates the destination entity. “GG” for Golden Gate
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	



**Figure 10-2 Violation Response File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	Unique transaction number for which this record is response. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Response for the type of transaction received by CSC. 2 – Violation
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143
TOL_POSTED_DATE	CHAR (10)	This is the Date the transaction was processed (Posted or Rejected) on the CSC / Away Agency. Format: MM/DD/YYYY
TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements/notices to indicate the place of occurrence of the transaction. Value = “GGB”
TOL_LANE_ID	CHAR (2)	The lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements/notices to indicate the point of occurrence of the transaction. Values = 00 – 99.
TOL_FARE_POSTED_AMOUNT	CHAR (5,2)	This is the amount posted to the ETC home or away account, posting by Tag or Plate. Values: 00000 (\$000.00) – 99999 (\$999.99)
VIOL_PAYMENT_FEE	CHAR (5)	This is the amount received at the CSC for violations that were escalated to noticing.
NON_REVENUE_FLAG	CHAR (2)	This field indicates if the transaction was posted against Non-Revenue account. Values: 00 – Default Value 01 – Non Revenue Account
PAYMENT_TYPE	CHAR (1)	0 – Default interim value  Final Values 1 – ETC posted successfully as VTOL 2 – ETC posted successfully as ITOL. 3 – ETC posted successfully as LPTOL 4 – ETC posted successfully as ONETOL. 5 – ETC posted successfully as INVTOL. V – Toll marked by the lane as a Violation and did not post to a CSC account E – An Exception occurred while trying to post this toll.
CSC_REASON_CODE	CHAR (3)	Reason violation transactions were not posted. CSC generates this code from its own internal processing and it is sent to the GGBD Plaza Host for reference. Values 000 – 999. A detailed listing of the various reason codes is provided in Appendix B.
BUSINESS_DATE	CHAR (10)	The actual business date of the transaction. This field would identify the revenue date of the transaction. Format: MM/DD/YYYY



Field Name	Type/Size	Description/Valid Values
CSC_BATCH	CHAR (10)	This will be used to reconcile CSC and GGBD Plaza Host revenue numbers. This field will contain the original file id (extern_file_id), to map the file in which this transaction was received at the CSC. The contents of this field shall be left padded with zeros. Values: 0000000000 – 9999999999
PLATE_NUMBER	CHAR (10)	Plate Number of the vehicle as determined by the CSC per the IMAGE_REVIEW_STATUS above.
PLATE_STATE	CHAR (4)	Plate State of the vehicle as determined by the CSC per the IMAGE_REVIEW_STATUS above.
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>73</b>	

**Figure 10-3 Violation Response File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	“#TRAILER”
SEQUENCE #	CHAR (6)	Same as Header
FILE_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>33</b>	

## 10.5.Processing requirements

1. All transactions received at the VECTOR CSC, via the Violation Transaction File, shall be sent back to the GGB Host in the reconciliation file.
2. All violation transactions TOL\_TRX\_TYPE = 2 received by the CSC, will be reconciled back with an interim code for all Home and CTOC transactions. The reconciliation will be at file level. Example CSC receives 100 transactions in file 123, same 100 transactions will be reconciled back to GGBD in one file, no less than once a day. In order to accommodate GGB Host operational requirements, VECTOR CSC will reconcile all GGB transaction files by 10 am the following day.
3. The CSC will produce reconciliation within 9 hours of receipt of transaction file and will produce reconciliation files by 10am each day for the previous day’s files. The check for receipt of reconciliation files, by GGB, should be performed no earlier than 10:30am for the previous day’s transaction files. This check will be repeated every 4 hours.
4. The VECTOR CSC shall perform transaction reconciliation at a detail level. i.e. the reconciliation file shall contain details at the transaction level instead of a reconciliation summary.
5. The VECTOR CSC shall assign a unique value to all incoming transaction files from the GGB Host. This unique identifier shall be sent as part of the reconciliation file to the GGB Host for all transactions posted and reconciled against a particular agency. The unique identifier shall be specified in the CSC\_BATCH field of the reconciliation file.





6. As each violation transaction in a file moves through CSC's violation transaction processing flow, the CSC will send interim reconciliation codes reflecting the current status of the transaction. A .vres file containing the sequence number of the corresponding original .vio file will be sent on each day updates occur to any transaction(s) in the original file. Updates can occur to the following fields in a violation transaction:
  - a. TOL\_POSTED\_DATE
  - b. TOL\_FARE\_POSTED\_AMT
  - c. TOL\_FARE\_USED
  - d. VIOL\_PAYMENT\_FEE
  - e. NON\_REVENUE\_FLAG
  - f. PAYMENT\_TYPE
  - g. PLATE\_NUMBER
  - h. PLATE\_STATE
  - i. CSC\_REASON\_CODE
7. The CSC shall populate the TOL\_FARE\_POSTED\_AMT only when it receives payment for a transaction. If the CSC receives partial payment for a transaction, the CSC will populate the field with that amount for the reconciliation file in which the CSC reports that partial payment. If the CSC continues to attempt to collect funds on the transaction, the CSC should use an appropriate interim status code. In subsequent reconciliation updates, the TOL\_FARE\_POSTED\_AMT should be set back to zero. When the CSC collects further funds for the transaction, the CSC will populate the TOL\_FARE\_POSTED\_AMOUNT with new amount received and the appropriate status code. This process should continue until the CSC assigns a final status code to the transaction.
8. The CSC will try to match all violation transaction to their corresponding image file and will return a status of 'transaction matched-send to image review' for those transactions. For all transactions, which are pending image review and are in a 'waiting for image' status, for more than 5 days will have to be researched by the GGB host.
9. When a transaction pays as a violation, the CSC shall populate the TOL\_FARE\_POSTED\_AMT and VIOL\_PAYMENT\_FEE fields.
10. The VECTOR CSC sends a single response code for each transaction in a given response file. In the remote case that two responses for a single transaction should occur, the last response listed in that file is the most up to date response and shall be used.
11. The VECTOR CSC sends response files to the District every 12 hours.

## 10.6.Sample File

20040203044030.vres

#HEADER,VRES ,000001,02/02/2004,AT,GG,02/03/2004,04:40:30



0000003484,2,0895,133015,02/02/2004,GGB,01,00350,00000,00,A,103,02/02/2004,0003484564  
0000003485,2,0956,133015,02/02/2004,GGB,02,00450,00000,00,A,103,02/02/2004,0003484564  
0000003486,2,\* ,\* ,02/02/2004,GGB,03,00350,00000,00,V,102,02/02/2004,0003484564  
0000003487,2,0345,133015,02/02/2004,GGB,04,00300,00000,00,A,103,02/02/2004,0003484564  
0000003488,2,0243,133015,02/02/2004,GGB,05,00550,00000,00,A,103,02/02/2004,0003484564  
#TRAILER,000001,02/03/2004,00000005



# 11. DMV Request File – eTIMS

---

The following sections define the file name and the record format of the DMV request record.

## 11.1. DMV Request File Name Format

The DMV request file name format is –

**AA\_DMV\_TOTALS\_YYYYMMDD.JCL**

where,

**AA** = character agency abbreviation

**YYYY** = year when file is created

**MM** = month when file is created

**DD** = day number when file is created

There is only one DMV request file created per agency per day. An example of a file name is –

**NY\_DMVREQUEST\_20100815.JCL**

## 11.2. DMV Request Field Format

The following table describes the DMV request field format. This is a common format applied across all implementations of VECTOR. A sample record is shown below –

**NJXS795V 0015686538830NTA 201008100000227 11015**

**Figure 20-1 DMV Request File Non-CA – Detail Structure**

Field Name	Data Type	Length	Offset	Justified	Pad Char	Description
PLATE STATE	CHAR	2	1	Left		This is the plate state captured from the plate image
PLATE NUMBER	CHAR	8	3	Left	Space	This is the plate number captured from the plate image
REQ TYPE	CHAR	2	11			PLATE_TYPE. ( Plate State specific )
LANE TX ID	CHAR	12	13	Right	Zero	This is the identifier of the lane transaction for which the image was captured. Can be used as citation_number
REQ OFFICE	CHAR	3	25	Left		The agency requesting the information.
FILLER1	CHAR	1	28			Unused
NUM MAKE	CHAR	2	29			Unused
TX DATE	CHAR	8	31	Left		This is the date the transaction occurred in the format YYYYMMDD
JULIAN DATE	CHAR	7	39	Right	Zero	This is the Julian day the transaction occurred
REQ HOLD	CHAR	1	46			Unused
PLATE YEAR	CHAR	4	47			Unused
REQ ALPHA MAKE	CHAR	5	51	Right	Zero	DMV file id for the file in which the record is being sent
REQ ORIG PLATE	CHAR	8	56			Unused
REQ ORIG TYPE	CHAR	2	64			Unused
TX_TIME	CHAR	6	66	LEFT		HHMISS ( 24 hrs. format)
VIOLATION_TYPE	CHAR	20	72	LEFT		TOLL
PLAZA	CHAR	4	92	LEFT		Plaza location of violation
LANE	CHAR	16	96	LEFT		Lane – Location of violation
DUE_DATE	CHAR	8	112	LEFT		Estimated payment due date ( if notice is issued)
AMOUNT DUE	CHAR	7	120	LEFT	9999.99	Estimated toll ZERO delimited
<b>RECORD DELIMITER</b>	<b>CHAR</b>	<b>1</b>	<b>127</b>			Newline character

## 11.3. File Transmission

Only one DMV request, response or reject file is prepared and exchanged each day. The files are exchanged through a Windows 2003 server [10.36.213.72] that is placed in a demilitarized zone. The objective is to permit e-TIMS (the agency that fetches the vehicle owner’s name and address information for the state DMVs, POLK or NLETS) to access the Windows server to pick-up or drop files. The dropped files are exchanged with the batch servers by scheduled jobs, where they are processed.

# 12.DMV Response File – eTIMS

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The following sections define the file name and the record format of the DMV Response record.

## 12.1. DMV Response File Name Format

The DMV Response file name format is –

AA\_dmv\_return\_YYYYMMDD.dat

where,

**AA** = character agency abbreviation  
**YYYY** = year when file is created  
**MM** = month when file is created  
**DD** = day number when file is created

There is only one DMV Response file created per agency per day. An example of a file name is –

PA\_dmv\_return\_20100815.dat

## 12.2. DMV Reject File Name Format

The DMV response file name for rejected transactions is –

AA\_dmv\_rejects\_YYYYMMDD.dat

where,

**AA** = character agency abbreviation  
**YYYY** = year when file is created  
**MM** = month when file is created  
**DD** = day number when file is created

There is only one DMV Reject file created per agency per day. An example of a file name is –

ny\_dmv\_rejects\_20100815.dat

## 12.3.DMV Response & Reject Field Format

The following table describes the DMV Response & Reject field format. Both file types share a common record format. This is a common format applied across all implementations of VECTOR.

Figure 21-1 DMV Response File Non-CA – Detail Structure

Field Name	Data Type	Length	Offset	Justified	Pad Char	Description
PLATE STATE	CHAR	2	1	Left		Plate State
PLATE NUMBER	CHAR	10	3	Left	Space	Plate Number
PLATE TYPE	CHAR	2	13	Left		Plate Type (if applicable for the plate state)
ORIG P STATE	CHAR	2	15	Left		Original plate state
ORIG PLATE NUMBER	CHAR	8	17	Left	Space	Original plate number
ORIG PLATE TYPE	CHAR	2	25	Right	Space	Original plate type
TICKET	CHAR	12	27	Right	Zero	Lane tx id
CLIENT	CHAR	3	39	Left		Requesting agency
ISSUE DATE	CHAR	8	42	Left		The effective date when the plate was issued
INV ISSUE DATE	CHAR	7	50			Unused
REQUEST DATE	CHAR	7	57			Unused
LOAD DATE	CHAR	7	64			Unused
SHIP DATE	CHAR	7	71			Unused
RETURN DATE	CHAR	7	78			Unused
TRANS DATE	CHAR	7	85	Left		The date of the lane transaction
PLATE YEAR	CHAR	2	92			Unused
PLATE CODE	CHAR	1	94			Unused
TKT ALPHA MAKE	CHAR	8	95			Unused
TKT NUMERIC MAKE	CHAR	2	103			Unused
DMV ALPHA MAKE	CHAR	8	105	Left	Space	Make of the vehicle
MODEL YEAR	CHAR	2	113	Left		Model year of the vehicle
BODY	CHAR	6	115			Unused
EXP DATE	CHAR	8	121	Left		Registration expiration date
REGISTRY DATE	CHAR	8	129			Unused
TITLE DATE	CHAR	8	137			Unused
PENDING IND	CHAR	1	145			Unused
SHIPPING IND	CHAR	1	146			Unused
RETURN HIT IND	CHAR	1	147	Left		Possible values are defined in table T DMV RESPONSE POLICY. Value



Field Name	Data Type	Length	Offset	Justified	Pad Char	Description
						definitions are different for each state.
REMAIN LAST NAME	CHAR	20	148	Left	Space	Last name of registered owner of vehicle
NAME	CHAR	35	168	Left	Space	Full name of registered owner of vehicle
ADDRESS LINE1	CHAR	35	203	Left	Space	Address line 1 of vehicle's owner
ADDRESS LINE2	CHAR	35	238	Left	Space	Address line 2 of vehicle's owner
BEGIN CITY	CHAR	30	273	Left	Space	City
STATE	CHAR	2	303	Left		State
ZIP	CHAR	9	305	Left	Space	Zip+4
VIN	CHAR	30	314	Left	Space	Vehicle identification number
DRIVERS LICENSE	CHAR	30	344	Left	Space	Driver's license if the plate could be looked up. If there is no plate information, this field gives the error description as defined in table T DMV RESPONSE POLICY.
DATE OF BIRTH	CHAR	8	374	Left		Vehicle owner's date of birth
PREV PLATE	CHAR	10	382			Unused
PREV TITLE DATE	CHAR	8	392			Unused
CURR PLATE	CHAR	10	400			Unused
CURR TITLE DATE	CHAR	8	410			Unused
NUM FILL 1	CHAR	1	418			Unused
NUM FILL 2	CHAR	1	419			Unused
MASS ERROR 5 TO 8	CHAR	1	420			Unused
NO BOOT BYTE	CHAR	1	421			Unused
PLATE SUB TYPE	CHAR	1	422			Unused
PAD FILLER	CHAR	2	423			Unused
ADDRESS_SOURCE	CHAR	1	425			N = NELTS D = DMV P = POLK R = RENTAL F = FLEET
RENT FLEET REF NO	CHAR	12	426			
RENTAL COMPANY	CHAR	3	438			Rental company ID. ETIM will send list of rental companies and 3 digit code will be generated and included in the ICD.
RECORD DELIMITER	CHAR	4	440			Newline character

## 12.4. File Transmission





Only one DMV request, response or reject file is prepared and exchanged each day. The files are exchanged through a Windows 2003 server [10.36.213.72] that is placed in a demilitarized zone. The objective is to permit e-TIMS (the agency that fetches the vehicle owner's name and address information for the state DMVs, POLK or NLETS) to access the Windows server to pick-up or drop files. The dropped files are exchanged with the batch servers by scheduled jobs, where they are processed.

# 13. Violation Image Data File

---

## 13.1. File type

Fixed length, LF delimited

## 13.2. File name

Example: Image received from CALTRANS

<AGENCY\_ID><PLAZA\_ID><LANE\_ID><TRX\_DATE><TRX\_TIME><VEHICLE\_SEQUENCE\_NUMBER(LANE\_TX\_SEQUENCE\_NUMBER for GGBD)>.VDF

CAL000404\_20040528123456120000001234.VDF

CAL – AGENCY\_ID  
 04 – Plaza  
 04\_ – Lane (“\_” is used to fill the field size)  
 20040528 – Transaction Date  
 12345612 – Transaction Time (in milliseconds)  
 00001234 – Vehicle Sequence Number

#	# of Characters	Descriptions	Comments
1	5	CAL – AGENCY_ID	
2	4	0004 – Plaza	
3	2	04_ – Lane (“_” is used to fill the field size)	
4	6	20040528 – Transaction Date	
5	8	12345612 – Transaction Time (in milliseconds)	
6	10	0000001234 – Vehicle Sequence Number	

Example: Image received from GGBD

<AGENCY\_ID><LANE\_ID><TRX\_DATE><TRX\_TIME><VEHICLE\_SEQUENCE\_NUMBER(LANE\_TX\_SEQUENCE\_NUMBER for GGBD)>.VDF

GGB04\_200405281234561200001234.VDF

GGB – AGENCY\_ID



04\_ – Lane (“\_” is used to fill the field size)  
 20040528 – Transaction Date  
 12345612 – Transaction Time (in milliseconds)  
 00001234 – Lane transaction sequence Number

### 13.3.File Use

This file is created for each Violation transaction for which the Image is matched. The violation image data file should exactly match the filename of the image. The images should have a file type indicating the image number.

All images and Image Data file will be zipped and sent as one zipped file in the following order:

#### 13.3.1.CALTRANS File

CAL 0404\_200405281234561200001234\_vdf.zip. This file contains -

- CAL 0404\_200405281234561200001234.VDF
- CALT04035611032004040991.bmp
- CALT04035611032004040902.jpg
- CALT04035611032004040903.jpg
- CALT04035611032004040904.jpg
- CALT04035611032004040905.jpg

where CALT – Agency\_id  
 04 – Plaza Id  
 03 – Lane Id  
 561103 – Transaction sequence number  
 20040409 – YYYYMMDD  
 02 – Image number

Note: Image number shall always be 91 for all CALTRANS bmp images.

There are 3 places where the vehicle sequence #'s are relevant.

- a) .vdf zip filename.
- b) Within the .vdf zip there is 1 .vdf (data file) and image files.
  - a. The 1 .vdf (data file) contains VSN as well.

Below are table to identify what is received for EACH of the 3 steps above, currently in production.

1. VDF Zip File Name: CAL000201\_20111012160958990000647641\_vdf.zip

AGENCY	PLAZA	LANE		DATE	TIME	SEQ_NO	
CAL	0002	01	_	20111012	16095899	0000647641	_vdf.zip

2. VDF Name Inside the Zip file: CAL000201\_20111012160958990000647641.VDF

AGENCY	PLAZA	LANE		DATE	TIME	SEQ_NO	
CAL	0002	01	_	20111012	16095899	0000647641	.VDF

3. Detail Record inside the VDF:



Agency	Plaza	Lane	Date	Time	Seq No	Conf Level	Plate Number	Plate State	No of Images	Image Index
CAL	02	01	20111012	16095899	647641	98	5X06790	CA	5	1

### 13.3.2.GGB File

GGB04\_200405281234561200001234\_vdf.zip. This file will be zipped as one file with files in the following order –

- GGB04\_200405281234561200001234.VDF
- GGB04\_200405281234561200001234.1
- GGB04\_200405281234561200001234.2
- GGB04\_200405281234561200001234.3
- GGB04\_200405281234561200001234.4

where GGB – Agency Id

04 – Lane Id20040528 – YYYYMMDD

12345612 – Transaction time HHMMSSTT

34 – Vehicle sequence number

## 13.4.File layout

This file does not have any header or trailer record.

**Figure 22-1 Violation Image File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
AGENCY_ID	CHAR (3)	Agency the violation transaction occurred. (CALTRANS – “CAL” and Golden Gate – “GGB”)
PLAZA_ID	CHAR (4)	Plaza where the violation transaction occurred. Default to lead in Spaces
LANE_ID	CHAR (3)	Lane where the violation transaction occurred. Default to lead in Spaces
TRX_DATE	CHAR (8)	Violation transaction occurrence date. Format: YYYYMMDD
TRX_TIME	CHAR (8)	Violation transaction occurrence time. Format: HHMMSSTT (in milliseconds)
VEHICLE_SEQUENCE_NUM	CHAR (6)	The unique vehicle transaction sequence number generated by lane. Values:000000 – 999999
OCR_READ_CONFIDENCE	CHAR (3)	Over all Read confidence from the VIP (OCR Reader) Default to lead in spaces

Field Name	Type/Size	Description/Valid Values
PLATE_NUMBER	CHAR (10)	Plate Number of the vehicle Default to spaces after plate number
PLATE_STATE	CHAR (4)	Plate State of the vehicle Default to lead in spaces
NUMBER_OF_IMAGES_TRX	CHAR (1)	Number of Images for this transaction
IMAGE_INDEX_NUMBER	CHAR (1)	Image Index number used by OCR to read plate number and plate state. Default to spaces
FILLER	CHAR (10)	Reserved for Future
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>64</b>	

## 13.5. Processing requirements

- CALTRANS files should contain one black and white image in .bmp format, and four color images in .jpg format; GGB files should contain four black and white images in .jpg format. Images should not deviate from the format (color vs. black/white) specified.
- The .vdf file should be sent with all available images.
- All the images, along with the image data file, shall be zipped as specified in Section 20.3 of this document.
- The .bmp image is not required for CALTRANS processing. However, when a .bmp image is included, it must precede all .jpg images in the .vdf file.
- For Caltrans, the image numbers will start as follows; 02, 03, 04, 05, 91
- The four .jpg images should follow the progression of the vehicle through the lane, i.e. front images first, followed by rear images.
- There is no validation on the number of images (.jpg or .bmp), and if the number of image files is less than 5 for CALTRANS or 4 for GGB, the file will not reject.
- The BATA and GGB Host shall create this file to indicate the image information that is linked to the transaction on the CALTRANS and GGB lanes.
- All images from the file shall be processed based on the overall confidence level of the associated image.
- An overall confidence level of 98% shall be required at the VECTOR CSC for a CALTRANS image to be processed without image review, i.e. any image with an overall confidence level of 98% or higher shall not be subject to "manual" image review.
- In cases where the detail record indicates an overall confidence level of 98% or more but a zipped image file is not found, the transaction will be stored in the system. As No Image is found, the transaction will not go through further processing. The transactions will be rejected and final reconciliation status will be sent back. The transaction will stay as "waiting for image" for 30 days, after which, it will be set to "no image" status (i.e. end of violation processing). This is also applicable for all transaction files with no images.
- If the overall confidence level of an image in the file is indicated as less than 98%, the VECTOR CSC shall process the transaction after "manual" image review.
- Caltrans Files – if for any reason an OCR is not performed on the violation image, then the data file will contain a single -0- with lead in spaces in the OCR field and the plate and state fields will be left blank (spaces).
- For requirements 9, 10 and 11, an overall confidence level of 99% shall apply with regards to GGB images.



15. The CALTRANS host sends color and black/white images to the VECTOR CSC. The VECTOR CSC shall select from all images received (b/w or color), however the violation notice will contain a printed image in black and white.
16. VECTOR System tries to match the transactions to the images for one month (30 days from transaction date). After a month the transactions are reconciled back as Violation With No Image.
17. Violation Reports like V1NP shall be used to identify number of transactions waiting for Images. The CSC uses this report.
18. CSC timing considerations, for the receipt of this file, are based on the GGB standards of 5-day reconciliation back to the host. Hence the CSC expects a maximum delay of 5 days. However transactions not matched with images will appear as such on the transaction reports.
19. The VDF files shall be placed on a Unix machine, and any duplicate filenames shall be overwritten at the time of the drop.
20. Image files are sent by GGB no later than 6 days from image capture. 98% of images are reviewed at the RCSC by the 11<sup>th</sup> day from image capture at the lane.

## 13.6. Sample File

CALTRANS Sample VDF File: CAL 01 01 200411111031581100000265 CA1234 CA 41

GGB Sample VDF File: GGB401001 200411111031581100000001 4

# 14.DMV Holds/Release Request File

---

## 14.1.File type

Variable length, LF delimited

## 14.2.File name

<CA><hldrel><mmddy><hhmmss>.dat

e.g. Cahldrel050205122020.dat

MEhldrel – requesting hold/clears  
 050205 – Transaction Date  
 122020 – Transaction Time (in seconds)

## 14.3.File use

This file is created, by the VECTOR CSC, for each DMV hold/clear request to be sent to the DMV.

## 14.4.File layout

This file does not have any header or trailer record.

**Figure 14-1 DMV Hold/Clear Request File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
DMV_CLIENT_CODE	CHAR (2)	DMV code for the agency requesting the hold/clear Values: 'AT' – CALTRANS 'IR' - GGBR
REC_TYPE	CHAR (1)	Type of request – H – Hold R – Release C – Change ( We are not using this functionality)

Field Name	Type/Size	Description/Valid Values
CSC_PLATE_NO	CHAR (7)	Plate number identified by the CSC to be put on hold/clear by the DMV.
FILLER_1	CHAR (1)	Filler data Value: Space
LAST_NAME	CHAR (5)	The last name, as recorded in the CSC system. (First 5 chars only) Left justified, space filled.
DMV_TICKET_NUM	CHAR (11)	The unique citation number for the record going to the DMV. Left justified, space filled. (BLANK)
DMV_STATUS_CODE	CHAR (1)	For a plate related hold request, if the current plate was already put on hold by the DMV, through an earlier request by the CSC. For clear request, this field will be null. For a list of all status codes, please refer to the table below.
VIOL_DATE	CHAR (6)	Date of violation. Format: MMDDYY
VEHICLE_MAKE	CHAR (3)	Make of the vehicle, as recorded in the CSC system e.g. (BMW/HON/FOR/MER)
TRX_AMT_DUE	CHAR (3)	Amount due to the CSC for the violation (Violation amount + Fee.) Values: 000 – 999 (\$ only, no cents)
VIOL_NOTICE_DATE	CHAR (6)	Date the final notice (DMV Hold warning) was issued to the violator. Format: MMDDYY
DMV_COURT_CODE	CHAR (5)	DMV requestor code. Unique for each agency. Values: 01011 – CALTRANS 38006 – GGB
DMV_NOTICE_NO_SEQ	CHAR(15)	The unique citation number with sequence number for the record going to the DMV. Left justified, space filled Example: T14018136960018 Notice number : T1401813696 (11 digit number including T) Sequence number : 18 (left padded with 0) The total length can only be 15 characters.
LANE_TX_ID	CHAR(12)	LANE_TX_ID of the violation from VECTOR.
FILLER_2	CHAR (8255)	Filler data Value: Space
<b>Detail Record Total</b>	<b>133</b>	

## 14.5.Processing requirements

### HOLD Eligible

Violations that meet the below criteria should be sent for DMV Hold successfully:

1. Toll, first penalty, and second penalty that remains Open.





2. Part paid citations when Toll is paid and the FEE and PENALTY of the violation are in open status
3. Violations that are part of the notices which are under hold retry are also considered for DMV hold re-request
4. If the notice is a normal notice then the First notice should be created within 21 days from the transaction date
5. If the notice is an Invoice escalated notice then the First notice should be created within 21 days from the Invoice escalation date
6. Total Amount calculation

Total Amount = Toll Due+ Fee Due + Penalty Due +NSF Fee + Hold Fee  
 Only \$Value will be sent to DMV. Cents will ignore.

Ex. \$75.15 = \$75  
 \$75 .35 = \$75  
 \$75 .65 = \$75  
 \$75 .95 = \$75

7. Make should what have been received from DMV at time of DMV lookup

**HOLD NOT Eligible**

- Violations that meet the below criteria should not be sent for DMV Hold and they are eligible for collections:
  1. If the plate state of the transaction is not CA
  2. If the DMV Plate Type of the transaction is B, E or S
  3. If the violation is occurred before 36 months from the current date
  4. If there is any dismissal happened on the violation then violation example TOR, DIPC, etc.
  5. If no valid Vehicle Make information is available

**Figure 14-2 DMV Status Codes**

CODE	DESCRIPTION
0	MARK ELIGIBLE
1	MARK REQUEST
2	MARK CONFIRMED
3	CLEAR (CHARGABLE) REQUEST
4	CLEAR (CHARGABLE) CONFIRMED
5	CLEAR (FREE) REQUEST
6	CLEAR (FREE) CONFIRMED
7	CLEAR (FREE) REJECTED
8	MARK REQUEST REJECTED
9	CLEAR (CHARGABLE) REJECTED
A	MARK RE-REQUEST
B	MARK REJECTED RE-REQUEST
D	RMV CLEAR CONFIRMED (BOST)
F	RMV FREE CLEAR CONFIRMED (BOST)
U	UNRECONCILED (BOSTON ONLY)
R	NON-RENEW REG (LA)
C	PROOF OF PAYMENT (LA)
T	TRANSFER OF OWNERSHIP (LA)

### DMV HOLD Reject Retry.

- When a Hold or Release is rejected with specific reject code (10-RECORD UNAVAILABLE – RETRY 24 HOURS) then the transactions will be attempted for Hold or release confirmation at the maximum of 5 attempts. Even after the allowed attempts if the confirmation is not received then their status is set to the reject status

## 14.6. Sample File

CAhldrel050205122020.dat

# 15. DMV Holds/Release Response File

---

## 15.1. File type

Variable length, LF delimited

## 15.2. File name

<CA>< hldrel><mmddy>< hh24mmss>.don

e.g. Cahldrel05020512202003.don

CA – Static value  
hldrel – Static value (marks and clears)  
050205 – Transaction Date  
122020 – Transaction Time

## 15.3. File use

This file is created, by the DMV, for each DMV hold/clear request file received from the VECTOR.

## 15.4. File layout



This file does not have any header or trailer record.

**Figure 15-3 DMV Response File RAW DATA – Detail Structure**

Field Name	Type/Size	Description/Valid Values
DMV_RESP_CODE	CHAR (80)	DMV RESPONSE containing success and reject information.
DMV_CLIENT_CODE	CHAR (2)	DMV code for the agency receiving the hold/clear response from the DMV Values: 'AT' – CALTRANS 'IR' - GGBR
REC_TYPE	CHAR (1)	Type of request – H – Hold R – Release
DMV_PLATE_NO	CHAR (7)	Plate number, sent by the DMV, on which the hold/clear was applied.
FILLER_1	CHAR (1)	Filler data Value: Space
LAST_NAME	CHAR (5)	The last name, of the violator, as recorded with the DMV. (First 5 chars only) Left justified, space filled.
DMV_TICKET_NUM	CHAR (15)	The unique citation number for the record, as sent by the requesting agency. Left justified, space filled.
FILLER_2	CHAR (2)	Filler data Value: Space
DMV_STATUS_CODE	CHAR (1)	The status of the request of hold/clear, as sent by the DMV. Value: 0
VIOL_DATE	CHAR (6)	Date of violation. Format: MMDDYY
LANE_TX_ID	CHAR(12)	LANE_TX_ID of the violation from VECTOR.
VEHICLE_MAKE	CHAR (3)	Make of the vehicle, as recorded in the CSC system e.g. (BMW/HON/FOR/MER)
TRX_AMT_DUE	CHAR (3)	Amount due to the CSC for the violation (Violation amount + Fee.) Values: 000 – 999 (\$\$\$ only, no cents)
VIOL_NOTICE_DATE	CHAR (6)	Date the final notice (DMV Hold warning) was issued to the violator. Format: MMDDYY
DMV_COURT_CODE	CHAR (5)	DMV applicable requestor code. Unique for each agency. Values: 01011 – CALTRANS 38006 - GGB
FILLER_2	CHAR (876)	Filler data Value: Space
<b>Detail Record Total</b>	<b>2245</b>	

**Figure 15-3 DMV Response File FORMATTED DATA – Detail Structure**

## 15.5.Processing requirements

### HOLD REQUEST RESPONSE.

1. DMV Confirmed hold by providing

DMV\_RESP\_CODE = “ UPDATED \*\* “

2. HOLD confirmed. Vector will update the violation to HLDCNF and add \$3.00 Fee irrespective of violation status.
3. DMV Reject hold by providing  
Any Code which is not having “UPDATE” then it is considered as Reject. Below are few examples.  
DMV\_RESP\_CODE =  
C-NO MATCH ON MAKE \*\*  
K-NAME SUBMITTED ON CIT IS PRIOR R/O \*\*  
U-NO MATCH ON NAME AND MAKE \*\*
4. Vector will mark all the Reject Violation COLLELIG.
5. If Response Code : 10-RECORD UNAVAILABLE – RETRY 24 HOURS Then requite the transaction for Retry. If retry is done X(=5) Times thenmark as reject

# 16.Tag Status File – HOT

---

## 16.1.File type

Variable length, LF delimited

## 16.2.File name

<PROGRAM\_TYPE>\_YYYYMMDD\_HHMMSS.etc

Example: ht\_20030426\_100015.etc  
Tag status file created at 10:00:15 on 04/26/2003

This file will be zipped (ht\_200304261\_00015\_etc.zip) and contain the following files –

Example: gg\_20030426\_100001.etc  
at\_20030426\_100002.etc  
srat\_20041025\_030205.tag  
tcat\_20030426\_100006.tag  
cvat\_20030426\_100009.tag  
sdat\_20030426\_100013.tag

## 16.3.File use

The Tag Status File shall be created by the VECTOR CSC to inform the HOT Host as to the status of each tag associated with an account held by BATA or CTOC customers. This file shall then be used by the HOT Host to generate a tag status file for the HOT lanes.

CSC will generate tag status file for CALTRANS tag range, GGBD tag range separately. Transmission from CSC to HOT host will include 1 CALTRANS, 1 GGBD, 1 each CTOC Tag File zipped as one file.

## 16.4. File layout

Each field in the header, detail and trailer structure will be separated with Delimiter “,” comma.

**Table 16-1 Tag Status File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“TAGS”
ACTION_CODE	CHAR (4)	“INIT”
SEQUENCE #	CHAR (6)	Sequence # of the Tag Status File. This number is incremented every day. Values 000000 – 999999 Sequence Number will be unique per agency file. Sequence number will be incremented every time a new file is generated for home tag ranges. For files received from away agency, the sequence number will be as received.
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
SOURCE	CHAR (2)	Indicates the file-creating agency. “at” for BATA (CALTRANS AND GGBD) and corresponding CTOC agency names for the CTOC files.
DESTINATION	CHAR (2)	Indicates the destination entity. “ht” for HOT (for HOME tag files) and “at” for CTOC tag files
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
Header Total	<b>54</b>	

**Table 16-2 Tag Status File - Detail Structure**

Field Name	Type/Size	Description/Valid Values
ETC_TAG_ID	CHAR (8)	Tag Id in HEX Values: 00000000-0FFFE3FF
ACTION_CODE	CHAR (1)	Always “A”
TAG_TYPE	CHAR (1)	Values N – Non-Revenue, V – Valid, I – Invalid

Field Name	Type/Size	Description/Valid Values
SUBTYPE_1	CHAR (1)	Values N – Default, L – Lost, S – Stolen, B – Low balance, R – Not Used
SUBTYPE_2	CHAR (1)	N – Not Used
SUBTYPE_3	CHAR (1)	N – Not Used
LINEFEED	CHAR (1)	LF
Record Total	<b>14</b>	

**Table 16-3 Tag Status File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	“#TRAILER”
SEQUENCE #	CHAR (6)	Same as Header
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
LINEFEED	CHAR (1)	LF
Record Total	<b>33</b>	

## 16.5. Processing requirements

1. The VECTOR CSC shall complete the transmission of the comprehensive tag status file to the HOT Host drop-box as defined in Section 2 of the ICD.
2. In the event that an invalid header record is encountered (e.g., character data in a numeric field, etc.), the HOT Host shall reject the file and notify the VECTOR CSC via the Acknowledgement File defined in Section 10 of this document.
3. The RCSC will send one zipped tag status file to HOT. The zipped file will contain 6 separate files (AT; GG; TCA; SNDG; SR91 and CTV). If any of the 6 individual files received are bad, HOT Host will send ACK file to the RCSC with a status of 01. HOT Host will make an attempt to process any of the individual valid files and download to the lanes as per their current processing rules. In the case of a BAD CTOC file, the HOT Host will use their existing mechanism of using the latest CTOC Tag file and ignoring the BAD CTOC file. RCSC will log the problem upon receiving the ACK file (01) from the HOT Host. Upon received notification of an ACK file with a status of 01, the ACS System Admin will log and escalate the issue. They contact the HOT System Admin for detailed information. Once a decision has been reached appropriate action will be taken.

4. In the event that an invalid detail record is encountered (e.g., inappropriate TAG\_STATUS, etc.), the HOT Host shall skip the complete file and notify the VECTOR CSC via the Acknowledgement File. Please refer to Appendix C for processing rules on error data in files.
5. The HOT Host shall perform the appropriate sanity checks on the Tag Status File prior to its transmission to the lanes. Such sanity checks should include, but not be limited to:
  - a. Unusual growth in the number of tags from previous version
  - b. Unusual change in number of tags with a particular tag status
6. One form of validation by the Host could be an upper limit of 10% increase and a lower limit of 2%, as compared to previous file. This check can be lifted on notification from CSC. This can happen if the CSC receives large Tag Inventory. As per the current Business Rules, there is no reason for Tag Status file to decrease in size when compared to previous file. GGBD will perform this check on each individual file (CALTRANS range, GGBD range and on each CTOC agency files).
7. The CHP are currently the only full non-revenue account for HOT

**Table 16-4 Valid Tag Status Values for HOT Host**

Item #	Tag Status	Account Status	Financial Status	Discount Plan	Regional - CSC GGBD Tag Type	Regional - CSC GGBD Sub Type 1
1	INVENTORY	N/A	N/A	N/A	I	N
2	RETURNED	N/A	N/A	N/A	I	N
3	DAMAGED	N/A	N/A	N/A	I	N
4	RETURNDEF	N/A	N/A	N/A	I	N
5	SHIPVEND	N/A	N/A	N/A	I	N
6	TESTED	N/A	N/A	N/A	I	N
7	EXPIRED	N/A	N/A	N/A	I	N
8	LOST	Active	N/A	N/A	I	L
9	STOLEN	Active	N/A	N/A	I	S
10	ACTIVE	Active	Good Balance	Standard	V	N
11	ACTIVE	Active	Low Balance (Cash/Check)	Standard	V	B
12	ACTIVE	Active	Zero Balance (Cash/Check)	Standard	I	B
13	ACTIVE	Active	Revoked Warning (Cash/Check)	Standard	I	B





Item #	Tag Status	Account Status	Financial Status	Discount Plan	Regional - CSC GGBD Tag Type	Regional - CSC GGBD Sub Type 1
14	ACTIVE	Active	Good Balance	Non-Revenue	N	N
15	ACTIVE	Active	Low Balance (Cash/Check)	Non-Revenue	N	N
16	ACTIVE	Active	Zero Balance (Cash/Check)	Non-Revenue	N	N
17	ACTIVE	Active	Revoked Warning (Cash/Check)	Non-Revenue	N	N
18	N/A	Closed Pending	N/A	N/A	I	N

**Table 16-5 CTOC Tag Status Mapping Values for HOT Host**

Item #	CTOC Tag Type	CTOC Sub Type 1	Regional - CSC GGBD Tag Type	Regional - CSC GGBD Sub Type 1
1	N – Non Revenue (Universal to all entities)	N – Not Used	N – Non Revenue	N
2	V – Valid	N – Not Used	V – Valid	N
3	I - Invalid	N – Not Used	I – Invalid	N

## 16.6. Sample files

CALTRANS Tag File for HOT Lanes

at\_20040508\_100002.etc

#HEADER,TAGS,INIT,000967,05/08/2004,at,gg,05/08/2004,22:45:03

0FE00001,A,V,N,R,R

0FE00006,A,V,N,R,R

0FE00008,A,V,N,R,R

0FE0000A,A,I,L,R,R

.

DMV Holds/Clear Response File

#TRAILER,000967,05/08/2004,00315464

SR-91 Tag File for HOT Lanes

srat\_20041025\_030205.tag

#HEADER,TAGS,INIT,000907,05/08/2004,sr,at,05/08/2004,22:45:03

08100000,A,V,N,N,N

08100001,A,V,N,N,N

08100002,A,V,N,N,N

08100003,A,V,N,N,N

.

.

#TRAILER,000907,05/08/2004,00315464

# 17.ETC Transaction File – HOT

---

## 17.1.File type

Variable length, LF delimited

## 17.2.File name

680\_YYYYMMDDHHMMSS.hreq

Example:                   680\_20020928044100.hreq  
HOT transactions to VECTOR CSC created at 04:41:00 on 09/28/02

## 17.3.File use

The Transaction File shall be created by the HOT Host to inform the VECTOR CSC of all toll transactions occurring at HOT lanes. This file shall contain tagged transactions on HOT lanes due to BATA customers or CTOC customers with both valid and invalid statuses.

## 17.4.File layout

Each field in the header, detail and trailer structure will be separated with Delimiter “,” comma.

**Figure 17-1 ETC Transaction File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“HREQ”
SEQUENCE #	CHAR (6)	Sequence # of the Transaction File. This unique number is incremented for



Field Name	Type/Size	Description/Valid Values
		every file. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	This field will be populated with the transaction date of the first transaction in the file. Format MM/DD/YYYY
SOURCE	CHAR (2)	Indicates the file-creating agency. “H1” for HOT
DESTINATION	CHAR (2)	Indicates the destination entity. “AT” for BATA
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	

**Figure 17-2 ETC Transaction File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	Unique transaction number for each ETC transaction. Used to identify the transaction in the ETC reconciliation process. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Type of transaction. 1 – ETC. This is the default value.
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143
ENTRY_TOL_PLAZA_ID	CHAR (3)	The entry plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7 (other HOT agencies will be given a new Plaza Id)
ENTRY_TOL_LANE_ID	CHAR (2)	The entry lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.

Field Name	Type/Size	Description/Valid Values
ENTRY_TOL_TRX_DATE	CHAR (10)	The date of the occurrence of the transaction at ENTRY_TOL_LANE_ID. Format: MM/DD/YYYY. This toll transaction date information shall be shown on customer statements.
ENTRY_TOL_TRX_TIME	CHAR (8)	The time of the occurrence of the transaction at ENTRY_TOL_LANE_ID. Format: HH:MM:SS. This toll transaction time information shall be shown on customer statements.
EXIT_TOL_PLAZA_ID	CHAR (3)	The exit plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7 (other HOT agencies will be given a new Plaza Id)
EXIT_TOL_LANE_ID	CHAR (2)	The exit lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
EXIT_TOL_TRX_DATE	CHAR (10)	The date of the occurrence of the transaction at EXIT_TOL_LANE_ID. Format: MM/DD/YYYY. This toll transaction date information shall be shown on customer statements.
EXIT_TOL_TRX_TIME	CHAR (8)	The time of the occurrence of the transaction at EXIT_TOL_LANE_ID. Format: HH:MM:SS. This toll transaction time information shall be shown on customer statements.
TOL_FARE_ETC_AMT	CHAR (5,2)	The toll due as calculated by the HOT Lane / Host. This is the amount to be posted to the ETC home or away account, posting by Tag. Values: 00000 (\$000.00) – 99999 (\$999.99)
TOL_MSG_FLAG	CHAR (2)	The message buffer status flag. This field indicates whether or not a transaction was buffered. Values: 00-99. 1 – Toll packet transaction. 2 – Buffered tag transaction
TOL_AVC_CLASS	CHAR (2)	The class of the vehicle involved in the transaction. This field shall contain AVC class or as overridden by the collector classification. Values: Default 02
LANE_TX_SEQUENCE_NUMBER	CHAR (8)	The unique vehicle transaction sequence number generated by lane (Lane sequence number). Values:00000000 – 99999999



Field Name	Type/Size	Description/Valid Values
TOL_TAG_STATUS	CHAR (1)	The status of the tag at the time of the transaction. Values: 0 – 9 0 - Invalid 1 – Good 2 – Lost 3 – Stolen 4 – Low Balance 8 – Non-revenue vehicle (NRV)
TOL_DST_FLAG	CHAR (1)	The daylight savings time. The contents of this field shall be used to govern certain processing rules at the VECTOR CSC This field will always default to asterisk (*)
TOL_TRX_SPEED	CHAR (3)	The transaction speed as reported by the lane. Values 000 – 999
VIOL_NUMBER/ORIG_TRX_NUMBER	CHAR (10)	For ETC transactions this field will contain 0000000000
RESOLV_CODE	CHAR (2)	Default to 00
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>84</b>	

**Figure 17-3 ETC Transaction File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	“#TRAILER”
SEQUENCE #	CHAR (6)	Same as Header
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
DETAIL_TRANS_AMOUNT	CHAR (10)	Total Amount of the Amount Due field for all the transactions in the file
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>43</b>	

## 17.5. Processing requirements

1. The RCSC shall receive and process ETC Transaction Files from the HOT Host multiple times a day at predetermined intervals (viz. every 0.5hrs, 1hr etc to be determined later).
2. There are no violation transactions from the HOT lanes
3. Please refer to Appendix D for all transaction-processing rules.
4. ETC transactions in this file will have a unique transaction number for each record in the file.
5. All transactions coming in this interface will be processed and the resolve code values will be ignored.
6. The RCSC shall perform sanity checks on the ETC Transaction File to look for formatting errors, record count mismatch between header and detail records etc. In the event the file fails on these sanity checks, the VECTOR CSC shall notify the HOT Host of the anomaly by means of the acknowledgment file.
7. If the RCSC determines an error in a detail record, the VECTOR CSC shall reject the transaction record with the error and process the remainder of the transaction file and notify the HOT Host of the error via the acknowledgment file. The ACK file shall have a corresponding error code indicative of the error.
8. The RCSC shall not compute toll amounts for ETC transactions received from the HOT Host. The toll amount calculated at the HOT Host as supplied in the TOL\_FARE\_ETC\_AMT field of the transaction file shall be used to debit the BATA Regional CSC accounts. This shall include transactions due to non-revenue customers also
9. RCSC has the capability of rejecting transaction based on the age of the transaction. VECTOR will set 180 days for all incoming transactions from Away Agency (TCA, SR91 or SNDG) and 365 days for all incoming transactions from Home Agencies (CALTRANS, GGBD, HOT). This value can be changed on BATA direction.
10. The RCSC shall first check its own customer base to see if the transaction can be applied to one of its own accounts before including the transaction in a Transaction File destined for another CTOC agency.
11. TOLL\_DST\_FLAG is not part of the unique key for toll transactions and there shall not be any duplicate values as a result of asterisks (\*). Added to ICD 1.4.1
12. Agency/Facility/Plaza IDs:
  - A. CTOC: RCSC sends the entry details (lane, plaza date and time) to CTOC as per CTOC ICD.
  - B. Mail House: CSC sends both entry & exit information to the mail house and the mail house prints the entry and exit plazas and entry time detail on the customer statement.



- C. Fastrak Website: The customer accounts statement page will have the entry and exit plazas and entry time information available for I-680 and SR 237 transactions. Entry is entry and exit is exit. The plaza descriptions for the web will be (maximum of 20 characters): SR237/I880 ExpressWB and SR237/I880 ExpressEB.
- D. Vector Online: The exit plaza/lane/date & time and entry plaza/lane/date & time will be listed.
- E. Reports: RCSC reports only show the exit plaza.

## 17.6.Sample file

680\_20110304020010\_hreq

```
#HEADER,HREQ,000239,03/04/2011,H1,AT,03/04/2011,02:00:10
0000219959,1,0305,145006,WSH,01,03/03/2011,05:07:07,MIS,01,03/03/2011,05:08:04,00100,01,02,00000000,1,* ,000,0000000000,00
0000219960,1,0103,261404,AND,01,03/03/2011,05:14:47,MIS,01,03/03/2011,05:19:51,00125,01,02,00000000,1,* ,000,0000000000,00
0000219961,1,0132,261882,AND,01,03/03/2011,05:20:18,CAL,01,03/03/2011,05:28:24,00150,01,02,00000000,1,* ,000,0000000000,00
0000219962,1,0667,145001,WSH,01,03/03/2011,05:21:38,MIS,01,03/03/2011,05:22:35,00100,01,02,00000000,1,* ,000,0000000000,00
0000219963,1,0834,261834,AND,01,03/03/2011,05:25:48,MIS,01,03/03/2011,05:30:34,00125,01,02,00000000,1,* ,000,0000000000,00
0000219964,1,0885,261379,WSH,01,03/03/2011,05:29:55,MIS,01,03/03/2011,05:30:56,00100,01,02,00000000,1,* ,000,0000000000,00
0000219965,1,0289,261242,AND,01,03/03/2011,05:34:28,MIS,01,03/03/2011,05:39:19,00150,01,02,00000000,1,* ,000,0000000000,00
0000221358,1,0159,262047,MIS,01,03/03/2011,19:43:26,CAL,01,03/03/2011,19:47:09,00030,01,02,00000000,1,* ,000,0000000000,00
#TRAILER,000239,03/04/2011,00000008,0000000880
```

## 17.7.Plaza ID & Entry/Exit Mapping for RCSC

Below plaza-id & entry/exit mapping will be used by the RCSC for Vector view, statement processing & exchanging transactions with CTOC agencies.

Entry/Exit Point	Statement				CTOC Plaza ID
	Facility	Plaza	Lane	Facility Description	
Andrade Entry	I-680	AND	1	I-680 South Andrade	5010
Washington Entry	I-680	WSH	1	I-680 South Washington	5011
Mission Entry/Exit	I-680	MIS	1	I-680 South Mission	5012
Calaveras Exit	I-680	CAL	1	I-680 South Calaveras	5013

Valid Trip combinations





Trip	RCSC File Entry Plaza	RCSC File Exit Plaza	CTOC File Entry Plaza	CTOC File Entry Plaza	DPH Entry Plaza	DPH Exit Plaza
Andrade to Mission	AND	MIS	5010	5012	AND	WSH
Andrade to Calaveras	AND	CAL	5010	5013	AND	MIS
Washington to Mission	WSH	MIS	5011	5012	WSH	WSH
Washington to Calaveras	WSH	CAL	5011	5013	WSH	MIS
Mission to Calaveras	MIS	CAL	5012	5013	MIS	MIS

**SR 237/I-880**

Entry/Exit Point	Statement				CTOC Plaza ID
	Facility	Plaza	Lane	Facility Description	
SR 237/I-880 Express Connector WB	SR 237	CLW	1	SR 237/I-880 Connector WB	5110
SR 237 First WB	SR 237	FSW	1	SR 237 First WB	5111
SR 237 First EB	SR 237	FSE	1	SR 237 First EB	5118
SR 237/I-880 Express Connector EB	SR 237	CLE	1	SR 237/I-880 Connector EB	5119

Valid Trip combinations

Trip	RCSC File Entry Plaza	RCSC File Exit Plaza	CTOC File Entry Plaza	CTOC File Exit Plaza
SR 237/I-880 Express Connector WB	CLW	FSW	5110	5111
SR 237/I-880 Express Connector EB	FSE	CLE	5118	5119

# 18.ETC Response File – HOT

---

## 18.1.File type

Variable length, LF delimited

## 18.2.File name

680\_YYYYMMDDHHMMSS.hres

Example: 680\_20020928044100.hres      Created at 04:41:00 on 09/28/02  
Transaction Reconciliation file from VECTOR CSC to HOT Host

## 18.3.File use

The VECTOR CSC shall create an ETC Response File back to the HOT Host, for each transaction (.req) files received.

## 18.4.File layout

Each field in the header, detail and trailer structure will be separated with delimiter “,” comma.

**Figure 18-1 ETC Response File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“HRES”
SEQUENCE #	CHAR (6)	Sequence # of the original Transaction File. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	The date send in the .req header record, in the BUSINESS_DATE column, will

ETC Response File - HOT

Field Name	Type/Size	Description/Valid Values
		be sent back in this field.
SOURCE	CHAR (2)	Indicates the destination entity. "AT" for BATA
DESTINATION	CHAR (2)	Indicates the file-creating agency. "H1" for HOT
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	

Figure 18-2 ETC Response File – Detail Structure

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	Unique transaction number for which this record is response. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Response for the type of transaction received by CSC. 1 – ETC
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143
TOL_POSTED_DATE	CHAR (10)	This is the Date the transaction was processed (Posted or Rejected) on the CSC / Away Agency. Format: MM/DD/YYYY
ENTRY_TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7
ENTRY_TOL_LANE_ID	CHAR (2)	The entry lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
EXIT_TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7
EXIT_TOL_LANE_ID	CHAR (2)	The exit lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
TOL_FARE_POSTED_AMOUNT	CHAR (5,2)	This is the amount posted to the ETC home or away account, posting by Tag. Values: 00000 (\$000.00) – 99999 (\$999.99)
NON_REVENUE_FLAG	CHAR (2)	This field indicates if the transaction was posted against Non-Revenue account. Values: 00 – Default Value 01 – Non Revenue Account
PAYMENT_TYPE	CHAR (1)	A – Toll posted successfully to ETC account. E – An Exception occurred while trying to post this toll.

Field Name	Type/Size	Description/Valid Values
CSC_REASON_CODE	CHAR (3)	Reason toll was not posted. CSC generates this code from its own internal processing and it is sent to the HOT Plaza Host for reference. Values 000 – 999. A detailed listing of the various reason codes is provided in Appendix B.
BUSINESS_DATE	CHAR (10)	The actual business date of the transaction. This field would identify the revenue date of the transaction. Format: MM/DD/YYYY
CSC_BATCH	CHAR (10)	This will be used to reconcile CSC and HOT Plaza Host revenue numbers. This field will contain the original file id (extern_file_id assigned by the RCSC), to map the file in which this transaction was received at the CSC. The contents of this field shall be left padded with zeros. Values: 0000000000 – 9999999999
CSC_ACCT_ID	CHAR (16)	Not currently used. Can be populated with home agency account IDs and static value CTOC agency account IDs.  Current default value for all home and away agency accounts: 0000000000000000
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>84</b>	

**Figure 18-3 ETC Response File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	“#TRAILER”
SEQUENCE #	CHAR (6)	Same as Header
FILE_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>33</b>	

## 18.5.Processing requirements

1. All transactions received at the RCSC, via the ETC Transaction File, shall be sent back to the HOT Host in the reconciliation file.



2. All regular transactions TOL\_TRX\_TYPE = 1 (ETC) received by the CSC, will be reconciled back with final status code. The reconciliation will be at file level. Example CSC receives 100 transactions in file 123, same 100 transactions will be reconciled back to HOT host in one file, no less than once a day.
3. The RCSC shall perform transaction reconciliation at a detail level. i.e. the reconciliation file shall contain details at the transaction level instead of a reconciliation summary.
4. In order to achieve file-to-file reconciliation with HOT, the RCSC will reconcile all transactions (home & away) with reconciled revenue. A reconciliation file will be sent to HOT once all transactions are reconciled (home & away) for each file.
5. In cases when a transaction cannot be posted at the RCSC, the RCSC shall indicate the reason, the transaction was not posted in the CSC\_REASON\_CODE field. The possible reason codes and the description are provided in Appendix B.
6. The RCSC shall assign a unique integer value to all incoming transaction files from the HOT Host. This unique identifier shall be sent as part of the reconciliation file to the HOT Host for all transactions posted and reconciled against a particular agency. The unique identifier shall be specified in the CSC\_BATCH field of the reconciliation file.
7. The RCSC shall use the toll amount as supplied in the TOL\_FARE\_CASH\_AMT field to process violations. All postable transactions shall use the amount in the TOL\_FARE\_ETC\_AMT field
8. The HOT Host will periodically generate and transmit ETC files to the CSC. HOT will periodically poll the area ACK files are transferred to the Host by the CSC. When an ACK file is received the HOT database will be updated. If the ACK file shows a FAILURE code the HOT Host will regenerate and resend the original file. A failure count will be maintained and after 3 concurrent failures of a single file an email will be sent to the HOT System Operators.
9. A recon file will always be ACKED with a FAILURE code if it is received before the ACK file for the corresponding ETC Transaction File.
10. Any transaction without entry and exit information will be rejected with the appropriate status and not processed at the RCSC.

## 18.6. Sample File

680\_20110304043301.hres

```
#HEADER,HRES,000239,03/04/2011,AT,H1,03/04/2011,04:33:01
0000219959,1,0305,145006,03/04/2011,WSH,01,MIS,01,00100,00,A,001,03/03/2011,0001633478,0000000000000000
0000219960,1,0103,261404,03/04/2011,AND,01,MIS,01,00125,00,A,001,03/03/2011,0001633478,0000000000000000
0000219961,1,0132,261882,03/04/2011,AND,01,CAL,01,00150,00,A,001,03/03/2011,0001633478,0000000000000000
```



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0000219962,1,0667,145001,03/04/2011,WSH,01,MIS,01,00100,00,A,001,03/03/2011,0001633478,0000000000000000  
0000219963,1,0834,261834,03/04/2011,AND,01,MIS,01,00125,00,A,001,03/03/2011,0001633478,0000000000000000  
0000219964,1,0885,261379,03/04/2011,WSH,01,MIS,01,00100,00,A,001,03/03/2011,0001633478,0000000000000000  
0000219965,1,0289,261242,03/04/2011,AND,01,MIS,01,00150,00,A,001,03/03/2011,0001633478,0000000000000000  
0000221358,1,0159,262047,03/04/2011,MIS,01,CAL,01,00030,00,A,001,03/03/2011,0001633478,0000000000000000  
#TRAILER,000239,03/04/2011,00000008

# 19.ETC Correction Request File – HOT

---

## 19.1.File type

Variable length, LF delimited

## 19.2.File name

<from\_agency>\_YYYYMMDDHHMMSS.creq

Example:                   680\_20020928044100.creq  
                                   HOT request for correction transactions to VECTOR CSC created at 04:41:00 on 09/28/02

## 19.3.File use

The correction file shall be created by the HOT Host to request toll posting corrections @ the RCSC. This file shall contain tagged transactions on HOT lanes that were previously reconciled by the RCSC and the HOT agency would be sending a correction request for such transactions.

## 19.4.File layout

Each field in the header, detail and trailer structure will be separated with Delimiter “,” comma.

**Figure 19-1 ETC Correction Transaction Request File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”



Field Name	Type/Size	Description/Valid Values
FILE_TYPE	CHAR (4)	“CREQ”
SEQUENCE #	CHAR (6)	Sequence # of the correction request file. This unique number is incremented for every file. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	This field will be populated with the transaction date of the first transaction in the file. Format MM/DD/YYYY
SOURCE	CHAR (2)	Indicates the file-creating agency. “H1” for HOT
DESTINATION	CHAR (2)	Indicates the destination entity. “AT” for BATA
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	

**Figure 19-2 ETC Correction Transaction Request File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	This must be the same as the original transaction. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Type of transaction. 2 – ETC Correction This is the default value.
TOL_CORRECTION_FLAG	CHAR (1)	A – Corrected Amount
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143
ENTRY_TOL_PLAZA_ID	CHAR (3)	The entry plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7 (other HOT agencies will be given a new Plaza Id)
ENTRY_TOL_LANE_ID	CHAR (2)	The entry lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.

Field Name	Type/Size	Description/Valid Values
ENTRY_TOL_TRX_DATE	CHAR (10)	The date of the occurrence of the transaction at ENTRY_TOL_LANE_ID. Format: MM/DD/YYYY. This toll transaction date information shall be shown on customer statements.
ENTRY_TOL_TRX_TIME	CHAR (8)	The time of the occurrence of the transaction at ENTRY_TOL_LANE_ID. Format: HH:MM:SS. This toll transaction time information shall be shown on customer statements.
EXIT_TOL_PLAZA_ID	CHAR (3)	The exit plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7 Other HOT agencies will be given a new Plaza Id
EXIT_TOL_LANE_ID	CHAR (2)	The exit lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
EXIT_TOL_TRX_DATE	CHAR (10)	The date of the occurrence of the transaction at EXIT_TOL_LANE_ID. Format: MM/DD/YYYY. This toll transaction date information shall be shown on customer statements.
EXIT_TOL_TRX_TIME	CHAR (8)	The time of the occurrence of the transaction at EXIT_TOL_LANE_ID. Format: HH:MM:SS. This toll transaction time information shall be shown on customer statements.
TOL_FARE_ETC_AMT	CHAR (5,2)	Original toll due as calculated by the HOT Lane / Host. This is the amount posted to the ETC home account, posting by Tag. Values: 00000 (\$000.00) – 99999 (\$999.99)
TOL_FARE_CORR_ETC_AMT	CHAR (5,2)	The new toll due as calculated by the HOT Lane / Host. Values: 00000 (\$000.00) – 99999 (\$999.99)
TOL_MSG_FLAG	CHAR (2)	The message buffer status flag. This field indicates whether or not a transaction was buffered. Values: 00-99. 01 – Toll packet transaction. 02 – Buffered tag transaction
TOL_AVC_CLASS	CHAR (2)	The class of the vehicle involved in the transaction. This field shall contain AVC class or as overridden by the collector classification. Values: Default 02
LANE_TX_SEQUENCE_NUMBER	CHAR (8)	The unique vehicle transaction sequence number generated by lane (Lane sequence number). Values:00000000 – 99999999

Field Name	Type/Size	Description/Valid Values
TOL_TAG_STATUS	CHAR (1)	The status of the tag at the time of the transaction. Values: 0 – 9 0 - Invalid 1 – Good 2 – Lost 3 – Stolen 4 – Low Balance 8 – Non-revenue vehicle (NRV)
TOL_DST_FLAG	CHAR (1)	The daylight savings time. The contents of this field shall be used to govern certain processing rules at the VECTOR CSC This field will always default to asterisk (*)
TOL_TRX_SPEED	CHAR (3)	The transaction speed as reported by the lane. Values 000 – 999
VIOL_NUMBER/ORIG_TRX_NUMBER	CHAR (10)	For ETC transactions this field will contain 0000000000
RESOLV_CODE	CHAR (2)	For ETC transactions this field will contain 00
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>84</b>	

**Figure 19-3 ETC Correction Transaction Request File – Trailer Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	“#TRAILER”
SEQUENCE #	CHAR (6)	Same as Header
BUSINESS_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
DETAIL_TRANS_AMOUNT	CHAR (10)	Total Amount of the Amount Due field for all the transactions in the file
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>43</b>	

## 19.5.Processing requirements

1. This interface is for toll amount correction/update only.
2. HOT system will send a maximum of 1 correction file per day.

3. HOT system will check for posting status of original transactions prior to sending a correction request for the same transaction.
4. HOT system will send original toll posted amount (for validation purposes) along with the corrected amount.
5. RCSC will perform corrections only on transactions that have originally posted to Fastrak customer accounts.
6. This interface is for BATA/Home customers only. In case any CTOC transactions are included in this file, the RCSC will reject the entire file with an ack file status of 01.
7. There will only be 1 adjustment per 1 posted transaction.
8. The RCSC will create 2 new transactions based on this interface.
  - i. Transaction #1 – will be posted to customer account as a reversal amount of the original posted amount.
  - ii. Transaction #2 – will be the new amount received from HOT in the correction file.
9. There is no time limit for creation & processing of a correct file

## 19.6. Sample file

680\_20040202222030.creq

680\_20101210020000\_creq

```
#HEADER,CREQ,000002,12/10/2010,H1,AT,12/10/2010,02:00:00  
0000107830,2,A,0816,260805,AND,01,12/08/2010,19:56:06,MIS,01,12/08/2010,20:01:41,00050,00040,01,02,00000000,1,*,000,0000000000,00  
#TRAILER,000002,12/10/2010,00000001,-000000009
```

# 20.ETC Correction Response File – HOT

---

## 20.1.File type

Variable length, LF delimited

## 20.2.File name

680\_YYYYMMDDHHMMSS.cres

Example: 680\_20020928044100.cres    Created at 04:41:00 on 09/28/02  
Correction transaction reconciliation file from RCSC to HOT Host

## 20.3.File use

The RCSC shall create a correction response file back to the HOT Host, for each transaction (.creq) files received.

## 20.4.File layout

Each field in the header, detail and trailer structure will be separated with delimiter “,” comma.

**Figure 20-1 ETC Correction Response File – Header Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (7)	“#HEADER”
FILE_TYPE	CHAR (4)	“CRES”
SEQUENCE #	CHAR (6)	Sequence # of the original correction request File. Values 000000 – 999999
BUSINESS_DATE	CHAR (10)	The date send in the .creq header record, in the BUSINESS_DATE column, will



Field Name	Type/Size	Description/Valid Values
		be sent back in this field.
SOURCE	CHAR (2)	Indicates the destination entity. "AT" for BATA
DESTINATION	CHAR (2)	Indicates the file-creating agency. "H1" for HOT
CREATE_DATE	CHAR (10)	Indicates the file creation date. Format MM/DD/YYYY
CREATE_TIME	CHAR (8)	Indicates the file creation time. Format HH:MM:SS
LINEFEED	CHAR (1)	LF
<b>Header Total</b>	<b>50</b>	

**Figure 20-2 ETC Correction Response File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
TRANSACTION_NUMBER	CHAR (10)	This must be the same as the original transaction. Values 0000000000 to 9999999999
TOL_TRX_TYPE	CHAR (1)	Type of transaction. 2 – ETC Correction This is the default value.
TOL_TAG_ID	CHAR (4)	This field consists of the ETC Internal Tag ID, in accordance with Title-21 specs. Values: 0000-1023
TOL_TAG_FACILITY_ID	CHAR (6)	This field comprises of the Facility code of the Issuing agency. Values: 000000-262143
TOL_POSTED_DATE	CHAR (10)	This is the Date the correction transaction was processed (Posted or Rejected) on the CSC. Format: MM/DD/YYYY
ENTRY_TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7
ENTRY_TOL_LANE_ID	CHAR (2)	The entry lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.
EXIT_TOL_PLAZA_ID	CHAR (3)	The plaza code of the agency at which the transaction occurred. This information shall be shown on customer statements to indicate the place of occurrence of the transaction. Value = Refer to table 24.7
EXIT_TOL_LANE_ID	CHAR (2)	The exit lane ID at the plaza where the transaction occurred. The information from this field shall be used on customer statements to indicate the point of occurrence of the transaction. Values = 00 – 99.



Field Name	Type/Size	Description/Valid Values
TOL_FARE_POSTED_AMOUNT	CHAR (5,2)	This is the amount posted to the home customer account (posting by Tag) This is the amount received in the TOL_FARE_CORR_ETC_AMT from the creq file Values: 00000 (\$000.00) – 99999 (\$999.99)
NON_REVENUE_FLAG	CHAR (2)	This field indicates if the transaction was posted against Non-Revenue account. Values: 00 – Default Value 01 – Non Revenue Account
PAYMENT_TYPE	CHAR (1)	A – Toll posted successfully to ETC account. E – An Exception occurred while trying to post this toll.
CSC_REASON_CODE	CHAR (3)	Reason toll was not posted. CSC generates this code from its own internal processing and it is sent to the HOT Plaza Host for reference. Values 000 – 999. A detailed listing of the various reason codes is provided in Appendix B.
BUSINESS_DATE	CHAR (10)	The actual business date of the transaction. This field would identify the revenue date of the transaction. Format: MM/DD/YYYY
CSC_BATCH	CHAR (10)	This will be used to reconcile CSC and HOT Plaza Host revenue numbers. This field will contain the original file id (extern_file_id assigned by the RCSC), to map the file in which this transaction was received at the CSC. The contents of this field shall be left padded with zeros. Values: 0000000000 – 9999999999
CSC_ACCT_ID	CHAR (16)	Not currently used. Can be populated with home agency account IDs and static value CTOC agency account IDs.  Current default value for all home and away agency accounts: 0000000000000000
LINEFEED	CHAR (1)	LF
<b>Detail Record Total</b>	<b>84</b>	

**Figure 20-3 ETC Correction Trailer File – Detail Structure**

Field Name	Type/Size	Description/Valid Values
RECORD_TYPE	CHAR (8)	“#TRAILER”

Field Name	Type/Size	Description/Valid Values
SEQUENCE #	CHAR (6)	Same as Header
FILE_DATE	CHAR (10)	File creation date, Format MM/DD/YYYY
DETAIL_COUNT	CHAR (8)	Total count of all detail records
LINEFEED	CHAR (1)	LF
<b>Trailer Total</b>	<b>33</b>	

## 20.5.Processing requirements

10. This interface is for toll amount correction/update only.
11. HOT system will send a maximum of 1 correction file per day.
12. HOT system will ensure that at any given point in time, only 1 correction request will be sent for a transaction that is posted to a customer's account.
13. HOT system will check for posting status of original transactions prior to sending a correction request for the same transaction.
14. HOT system will send original toll posted amount (for validation purposes) along with the corrected amount.
15. RCSC will perform corrections only on transactions that have originally posted to Fastrak customer accounts.
16. There will only be 1 adjustment per 1 posted transaction.
17. This interface is for BATA/Home customers only. In case any CTOC transactions are included in this file, the RCSC will reject the entire file with an ack file status of 01.
18. The RCSC will create 2 new transactions based on this interface.
  - i. Transaction #1 – will be posted to customer account as a reversal amount of the original posted amount.
  - ii. Transaction #2 – will be the new amount received from HOT in the correction file.
19. There is no time limit for creation & processing of a correct file.

## 20.6.Sample file

```
#HEADER,CRES,000002,12/10/2010,AT,H1,12/10/2010,07:58:01
0000107830,2,0816,260805,12/10/2010,AND,01,MIS,01,00040,00,A,001,12/08/2010,0001557351,0000000000000000
#TRAILER,000002,12/10/2010,00000001
```

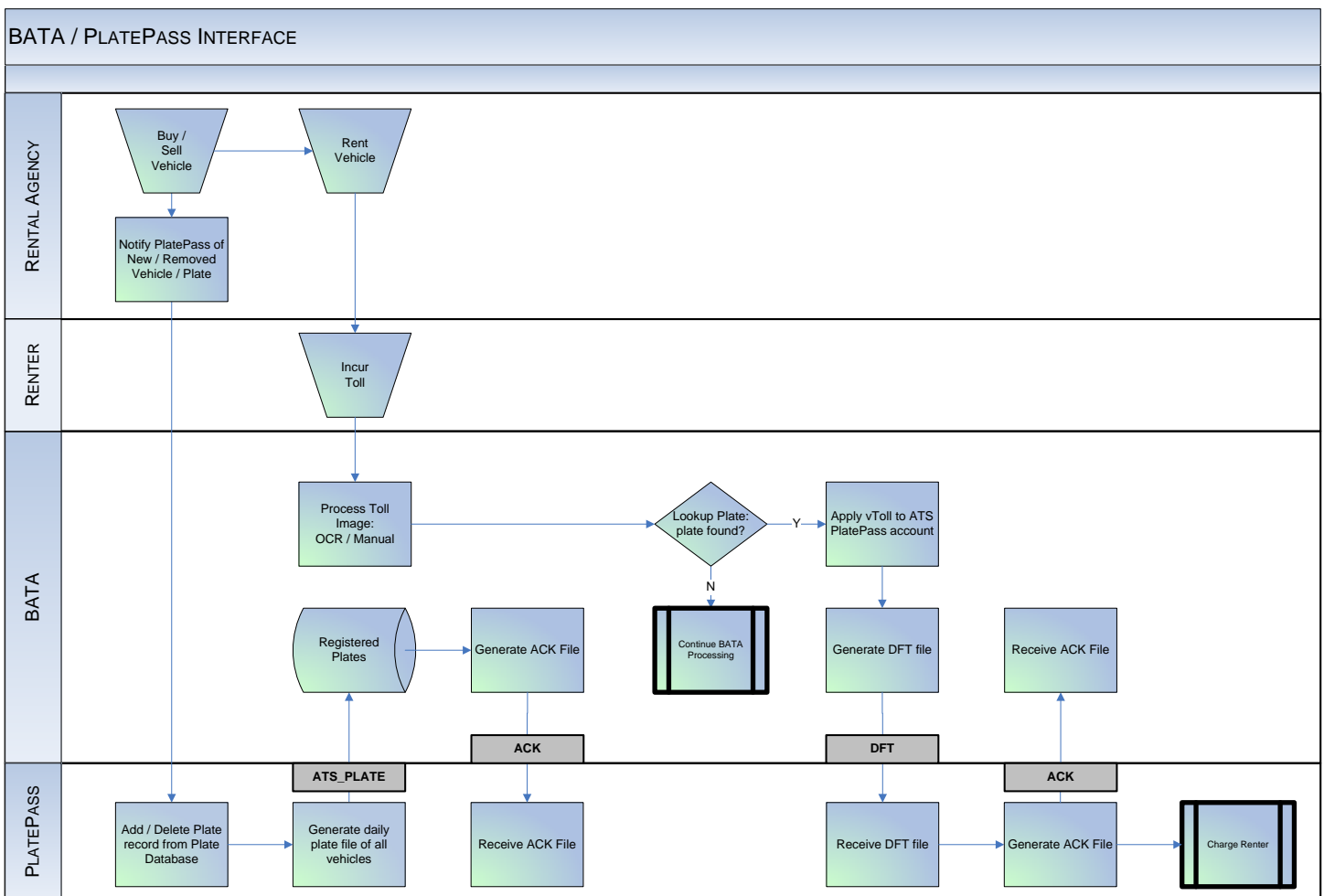


# 21. BATA – PlatePass Interface

## 21.1. Purpose

The purpose of this section is to outline the interfaces used to transfer data between PlatePass and the Bay Area Toll Authority Regional CSC (RCSC).

## 21.2. Diagram



## 21.3. Technical Specifications

### 21.3.1. File Exchange Methodology

The file transfer mechanism utilizes the ftp (file transfer) protocol over the Internet to exchange the data files to/from each agency's ftp server. The transfer files are created with an agency's proprietary software, but the files conform to the formats described in this document. The files are generated in an ASCII format, and then the sending agency encrypts the file using PGP (pretty good privacy) encryption tools, and the receiving agency's public key. This also has the effect of compressing the data. The sending agency then utilizes the ftp protocol to send the encrypted files to the receiving agency's ftp server. The receiving agency possesses its private key and can therefore decrypt the received files. After decryption, the receiving agency processes the data with their own proprietary software.

File exchanges to the respective drop boxes will be made on a daily basis outside of routine business hours in the early morning or late evening hours.

Requirements:

- Each agency will have a publicly accessible ftp server, with or without a DNS entry on the Internet. An ftp exchange can be accomplished with only the IP address.
- The receiving agency will provide a special account and password to each agency that will transmit files to it. This is to prevent anonymous users from accessing the ftp site. This information will be provided outside of this document for security reasons.
- Each agency shall install a PGP encryption package suitable for the platform they run on.
- Files will be encrypted before transmission to ensure the confidential data does not fall into unauthorized hands.

### 21.3.2. PlatePass Account

PlatePass will have a single FasTrak account. The account number will be assigned to PlatePass by the RCSC. The account is a pre-paid business account and all tolls from both Caltrans and Golden Gate Bridge will be posted via ITOL, Image Toll. The processing on this account is exclusively driven by license plates. All license plates on the account must be unique.

PlatePass will send a License Plate Load File that will be linked to the assigned FasTrak Account Number. The license plates will not be visible on the web or on Vector on-line. The plate file load along with the ACK file will act as confirmation the plates have been updated to the PlatePass Account.

## 21.4. Interfaces

### 21.4.1. Daily Plate File

The "Daily Plate Update" interface file provides a mechanism for PlatePass to provide the toll authority with an up to date file of license plates. The RCSC will post any toll associated with a PlatePass license plate against a PlatePass account.



The Daily Plate File shall be created by PlatePass to inform the RCSC all active license plates associated with the PlatePass account held by RCSC. This file shall then be used by the RCSC to post ITOL, image toll, transactions to the PlatePass account.

The daily transmission from PlatePass to RCSC will include a full Daily Plate File, encrypted and zipped.

**Interface Specification Format:**

**Interface Type:** One-Way Batch

**Initiating Party:** PlatePass

**Delivery Format:** Comma delimited text.

**Delivery Method:** FTP

**Frequency:** Once per day.

**File Name:** ATS\_PLATE\_YYYYMMDD\_HHMMSS.TXT

**File Records Header**

Field #	Field Name	Max. Length	Description	Format
1	Record Code	4	ATS will always send “SH01”.	Alphanumeric.
• 2	Originating Authority	8	This field will always be “ATS”.	Alphanumeric.
• 3	Date-Time Created	15	GMT Date-time file was created. ‘YYYYMMDD-HH24MISS’.  Inserting the file header will change the original file size. To address this issue, the file should first be created with a fully loaded file header using all ‘0’s, then complete the file build process so as to obtain the file size, and then recreate the file with the appropriate information loaded into the file header.	Alphanumeric.
• 4	Record Count	10	Number of records not including the header record to follow in this file.	Numeric.
• 5	Batch ID	10	Batch ID for the file. This field is a unique number between 0 and 4,294,967,295.	Numeric.
• 6	Update Type	10	Status update type: “FULL” = Complete list of all vehicles. “INCR” = Incremental list of vehicles, a periodic update. ATS will always send FULL for BATA.	Character.
• 7	File Name	60	Original file name for this file as created by the originator.	Alphanumeric.

Example: SH01,ATS,20020929-131545,2,6789,FULL,ATS\_PLATE\_20060620\_170000.TXT¶

**Data Records:** Each row in the file represents a license plate and its associated vehicle.

Field #	Field Name	Max. Length	Description	Format
1	Record Code	4	This field will always be ST01.	Alphanumeric.
• 2	BATA Account Number	15	The account number with BATA that the plate is associated with.	Alphanumeric.
• 3	License Plate State	2	The license plate state captured for the toll event.	Alphanumeric.
• 4	License Plate Number	10	The license plate number captured for the toll event.	Alphanumeric.
• 5	Inventory Start Date	15	This is used to pass the Effective Start Inventory Date.	YYYYMMDD-HH24MMSS.
• 6	Inventory End Date	15	This is used to pass the Effective End Inventory Date. This field is required when removing a vehicle from the fleet and will be left blank when adding a vehicle	YYYYMMDD-HH24MMSS.
• 7	Vehicle Make	30	Make of the vehicle the license plate is attached to.	Alphanumeric.
• 8	Vehicle Model	30	Model of the vehicle the license plate is attached to.	Alphanumeric.
• 9	Vehicle Year	4	Year of the vehicle the license plate is attached to.	Numeric.

Example 1:

ST01,879078654,TX,ABC123,20080101-120000,,FORD,TAURUS,2008¶

Example 2:

ST01,23451234,TX,XYZ456,2007101-180500,20080606-235959,FORD,TAURUS,2008¶

#### Daily Plate File Processing Requirements

1. PlatePass shall complete the transmission of the comprehensive daily plate file to the RCSC drop-box as defined in Section 3 of the ICD.
2. In the event that an invalid header record is encountered (e.g., character data in a numeric field, etc.), the RCSC shall reject the file and notify the PlatePass via the Acknowledgement File defined in Section 5 of this document.
3. PlatePass will send one zipped Plate File to RCSC. In the case of a BAD file, the RCSC will use their existing mechanism of using the latest Plate file and ignoring the BAD Plate file. Upon received notification of an ACK file with a status of 01, the PlatePass System Admin will log and escalate the issue. PlatePass will contact the RCSC System Admin for additional detailed information. Once a decision has been reached appropriate action will be taken.
4. In the event that an invalid detail record is encountered (e.g., inappropriate Plate Status, etc.), the RCSC Host shall skip the complete file and notify the PlatePass via the Acknowledgement File.
5. The RCSC Host shall perform the appropriate sanity checks on the Daily Plate File prior to loading it on the database. Such sanity checks should include, but not be limited to:
  - Unusual growth in the number of plates from previous version



Platepass will determine the appropriate tolerances for the sanity checks mentioned and provide these to the RCSC as required.

## 21.4.2. Daily Fleet Toll File

The daily fleet toll interface will be created by the RCSC to inform PlatePass of all toll (ITOL=Image Toll) transactions that occurred on the PlatePass designated account. This file shall contain transactions from both the Caltrans and Golden Gate Bridge facilities having a valid license plate listed on the account.

### Interface Specification Format:

**Interface Type:** One-Way Batch

**Initiating Party:** Toll Authority – RCSC

**Delivery Format:** Comma delimited text

**Delivery Method:** Daily FTP

**File Name:** DFT\_YYYYMMDDHHMMSS.TXT

### **File Records Header**

Field #	Field Name	Max. Length	Description	Format
1	Record Code	4	Toll Authority will always send “SH01”.	Alphanumeric.
2	Originating Authority	8	This field will be an agreed upon value per Toll Authority. This value will always be “BATA”	Alphanumeric.
3	Date-Time Created	15	GMT Date-time file was created. ‘YYYYMMDD-HH24MISS’.  Inserting the file header will change the original file size. To address this issue, the file should first be created with a fully loaded file header using all ‘0’s, then complete the file build process so as to obtain the file size, and then recreate the file with the appropriate information loaded into the file header.	Alphanumeric.
4	Record Count	10	Number of records not including the header record to follow in this file.	Numeric.
5	Batch ID	10	Batch ID for the file. This field is a unique number between 0 and 4,294,967,295.	Numeric.
6	File Name	60	Original file name for this file as created by the originator.	Alphanumeric.

Example: SH01,TBD,20020929-131545,2,6789,DFT\_20060620170000.TXT¶

**Data Records:** Each row in the file represents a toll billed to the PlatePass account



Field #	Field Name	Max. Length	Description	Format
1	Record Code	4	This field will always be ST01	Alphanumeric.
• 2	Toll Id	50	Unique toll Id that can be used for auditing purposes.	Alphanumeric.
• 3	BATA Account Number	15	BATA account number associated with vehicle that incurred a toll.	Alphanumeric.
• 4	License Plate State	2	The license plate state captured for the toll event.	Alphanumeric.
• 5	License Plate Number	10	The license plate number captured for the toll event.	Alphanumeric.
• 6	Number of Axles	4	Numeric value representing the number of axles (2, 3, 4, 5, 6, 7 or 8).	Numeric
• 7	Posted Date/Time	15	Date and time when toll was posted.	YYYYMMDD-HH24MISS.
• 8	Entry Date/Time	15	Date and time of toll location entry.	YYYYMMDD-HH24MISS.
• 9	Entry Location Code	10	Code of toll location entry point. This is the field used for barrier toll plaza transactions.	Alphanumeric.
• 10	Entry Location Description	50	Description of toll location entry point. This field is used for barrier toll plaza transactions	Alphanumeric
• 11	Exit Date/Time	15	Date and time of toll location exit. If the entry and exit point are the same this can be null/empty. This will be empty for barrier toll transactions.	YYYYMMDD-HH24MISS.
• 12	Exit Location Code	10	Code of toll location exit point. If the entry and exit point are the same this can be null/empty. This will be empty for barrier toll transactions.	Alphanumeric.
• 13	Exit Location Description	50	Description of exit toll location. If the entry and exit point are the same this can be null/empty.	Alphanumeric
• 14	Toll Cost	5	Amount toll costs ATS (ETC rate).	Numeric with two positions for the number before the decimal and two positions for the number after the decimal.

Example 1: ST01,48785744,767890432,TX,993GTB,2,20080616-210000,20080614-094301,6110,GRIFFEN RD EAST/WEST,,1.25,1.50¶

Example 2: ST01,48805097,345671234,FL,W81IEM,2,20080601-031059,20080530134132,5200,SR91/CYPRESS CREEK,20080530-134901,6410,US27/HIALEAH,3.75,4.00¶



### 21.4.3. Daily Fleet Toll File Processing requirements

1. The VECTOR RCSC shall send Daily Fleet Toll Files to PlatePass once per day.
2. The account will post ITOLS, Image Tolls, only. There will be no transponders associated with the PlatePass Account, only License Plates.
3. The VECTOR RCSC shall first check its own customer base to see if the transaction can be applied to one of its own accounts before checking the PlatePass Licenses Plate table.

### 21.4.4. Acknowledgement File

#### 21.4.5. File type

Fixed length, LF delimited

#### 21.4.6. File name

{FROM\_AGENCY}\_{FILE\_NAME}\_{FILE\_TYPE}. Ack

Example:     ATS\_2008120104101501\_ETC.ack

Acknowledgement file from Golden Gate Bridge created in response to the VECTOR CSC tag status file created at 04:10:15.01 on 12/01/2008

#### 21.4.7. File use

The Acknowledgment File shall be created by the receiving system (the VECTOR CSC or the ATS Hosts whosoever received the file) to inform the transmitting system (the VECTOR CSC or the ATS Hosts whosoever transmitted the file) that the file transmitted was received in its entirety. An Acknowledgement File shall be sent for

1. Daily full plate file - from ATS to BATA CSC
2. Daily fleet toll interface (toll posting at the CSC) file – from BATA CSC to ATS

#### 21.4.8. File layout

Figure 21-1 Acknowledgment File - Detail Structure

Field #	Field Name	Type/Size	Description/Valid Values
1	FILE_TYPE	CHAR (4)	ACK
2	FROM_AGENCY_ID	CHAR (3)	Standard code of the system that received the file referenced in ORIG_FILE_NAME_TYPE. Values: CSC – indicates VECTOR CSC ATS – indicates ATS/PlatePass
3	TO_AGENCY_ID	CHAR (3)	Standard agency ID code of the system that transmitted the file referenced in ORIG_FILE_NAME_TYPE. Values: CSC – indicates VECTOR CSC



Field #	Field Name	Type/Size	Description/Valid Values
			ATS – indicates ATS/PlatePass
4	ORIG_FILE_NAME_TYPE	CHAR (50)	The name and type of the file being acknowledged as received from the To Agency. Format: FILE_NAME.FILE_TYPE where FILE_NAME is the name of the file being acknowledged and FILE_TYPE is the type of the file being acknowledged.
5	FILE_DATE	CHAR (8)	Date ACK file created. Format: YYYYMMDD The system receiving this acknowledgment file shall use this as the acknowledgement date.
6	FILE_TIME	CHAR (6)	Time ACK file created. Format: HHMMSS This system receiving this acknowledgment file shall use this as the acknowledgement time.
7	RETURN_CODE	CHAR (2)	A code indicating the status of the file being acknowledged. Values: 00 – File was successfully received and verified. 01 – data elements in received file is not consistent with the ICD. File rejected in its entirety.
8	DELIMITER	CHAR (1)	LF
	<b>Detail Total</b>	<b>77</b>	

### 21.4.9. Processing requirements

1. This file shall contain a single record only. For each file received by the From Agency/CSC, the From Agency/CSC shall generate an Acknowledgement File and transmit the file back to the To Agency/CSC.
2. Error in ACK files will be recognized and escalated to production support for research and resolution. For example, if an ACK reject reason is received indicating the file is out of balance, this will initiate the research to correct the problem.
3. The ACK file indicates that a file was successfully received by the receiving agency. The ACK provides an audit trail for research and can be used as a key event, in the future, in the Regional CSC. The Regional CSC is not designed to recognize the receipt of an ACK file for the continuation of an operation (i.e. ATS Invoicing).
4. All incoming files that fail file-sanity checks (like header record count does not match the trailer record/ record length in file, does not match the ICD/ invalid checksum for CALTRANS) shall be rejected with reject code 01.
5. Records received, in transaction files, where the data elements are inconsistent with the ICD (like invalid date/invalid plaza\_id/invalid lane) shall be acked with a code of 00, if the file passed the sanity check, as mentioned in #4.

## 21.5. Exception Processing

Even though all interfaces are thoroughly tested prior to release into production, errors can occasionally occur. Errors can be categorized as either Pre-processing or Processing errors. Descriptions of each error type and how ATS will handle them is outlined below.

### 21.5.1. Pre-processing Errors

Prior to processing the Daily Fleet Toll file or the Plate Validation Request file, ATS runs a number of validations. These validations include checking the file size, verifying the header, etc. When a pre-processing error occurs, ATS will automatically generate an email with an attachment that describes what error occurred. These emails are then sent to the designated Toll Authority contact(s). When pre-processing errors occur, ATS will not process the file. The Toll Authority must correct the file and retransmit it for processing.

#### Pre-Processing Errors

Description	Error text
File Name in header doesn't match actual name.	file name does not match expected file name.
Record Count format.	count is not numeric in file records header.
Record Count does not match actual lines.	RECORD_COUNT_MISMATCH.
Line type <> SH01.	Line type is invalid in file records header.
Toll agency code not defined in our system.	Toll agency not defined.
Missing Account Number	Account number is invalid or missing.
Toll agency code information is not supplied.	TOLL_AGENCY_MISSING.
Batch ID missing in file header.	BATCH_ID_MISSING.
Batch ID has characters that are not numbers.	Batch ID is not numeric in file records header.
Physical size of file does not match size of file specified in the file header.	Expected file size does not match actual.

Example:

Expected file size does not match actual. Actual (specified in file): 107903 Expected (physical file size): 107084,FFFFFFFF,000000107903

#### Processing Errors

When processing the Daily Fleet Toll file or the Plate Validation Request file, ATS may encounter one or more records with errors. When errors occur, ATS will process all other records in the file. For the remaining unprocessed records with errors, ATS will automatically generate an email containing an attachment that describes the error along with the actual record. This data will be emailed to the designated Toll Authority contact(s). When processing errors occur, the toll authority must correct the records with errors and resubmit them in a correctly formatted file. The newly created file should only contain the corrected records and file header information. ATS regularly monitors the FTP site to receive and promptly process any corrected files posted by the tolling authority.

Description	Error text
License plate state missing	MISSING_PLATE_STATE
License plate not found in system	CANNOT_LOCATE_PLATE.



Description	Error text
(or expired).	
License plate missing.	TBR 016.
Line type <> ST01 on data record line.	INVALID_DATA_RECORD_LINE_TYPE_INDICATOR.
Negotiated price is missing.	TBR 008.
Negotiated price format incorrect.	AMOUNT_FORMATTED_INCORRECTLY.
Not enough fields supplied on data record line.	INVALID_NUMBER_OF_FIELDS.
Toll ID missing.	TOLL_ID_REQUIRED.
Toll date format incorrect.	TBR 009.
Cash price missing.	CASH_RATE_REQUIRED.
Cash price format incorrect.	CASH_RATE_FORMATTED_INCORRECTLY.
The axle field information is missing.	NUMBER_OF_AXLES_REQUIRED.
Axle field information is not numeric.	NUMBER_OF_AXLES_FORMATTED_INCORRECTLY.
Toll location is missing description.	LOCATION_DESCRIPTION_REQUIRED.
Entry and exit location codes are identical but descriptions are different.	ENTRY_AND_EXIT_DESCRIPTIONS_MISMATCHED.
Entry and exit codes are different and no exit location description is supplied.	EXIT_LOCATION_DESCRIPTION_REQUIRED.
The violation date is later than the exit date.	EXIT_DATE_EARLIER_THAN_VIOLATION_DATE.
Entry date is after the posting date.	POSTING_DATE_EARLIER_THAN_VIOLATION_DATE.
Axle count field is 0, 1 or greater than 8.	Axle count must be between 2 and 8.

## Example:

CANNOT\_LOCATE\_PLATE,ST01,3119056132,FL,103HBI,02,20080917-113335,20080913-212822,107224,SR 836 EAST,20080913-212822,107224,SR 836 EAST,.75,1.00

# 22.BATA RCSC – ATCAS II Interface

The Regional Customer Service Center (RCSC) interface supports the exchange of Electronic Toll Collection (ETC) transponder statuses from the RCSC to the ATCAS II Host, and the exchange of ETC toll transactions, toll violation transactions, toll transaction cancellations and corrections, and violation images from the ATCAS II Host and the RCSC. Response files are sent by the RCSC to the ATCAS II Host for the ETC toll transactions and toll violation transactions to indicate to the ATCAS II Host the disposition of these transactions.

The transponder status, transaction, and response files are zipped before being transferred through BATA FTP servers. The receiving system sends an acknowledgement file through the FTP servers indicating the status of each file received. A violation image data file is created by the Image Server at the plaza for each set of Violation Enforcement System (VES) images that can be associated with a lane transaction. The violation image data file and corresponding images are then zipped into a violation package and are sent to the Host Image Server (see Chapter 6 Section 6.6.2.4). All the new violation packages that can be associated with violation transactions that were posted to the ATCAS II Host Database since the last transfer are sent to the RCSC through the BATA FTP server.

The following table indicates which files are sent to the ATCAS II Host and which are sent to the RCSC, the file extension that identifies the type of file, and how the file is used. For zipped files, the period that precedes the file extension is replaced with an underscore (“\_”) and a new .zip file extension is added to the file name. The table also indicates which files are zipped.

**Table 22-1: RCSC Interface Files**

FILE	FROM -> TO	File EXT	ZIP'D	File Usage
Tag Status File	RCSC -> ATCAS II	AETC	Yes	Contains the status for each ETC Transponder at the RCSC and at other CTOC agencies
ETC Transaction File	ATCAS II -> RCSC	AREQ	Yes	Contains ETC transactions with a valid tag status
Violation Transaction File	ATCAS II -> RCSC	AVIO	Yes	Contains violation transactions with or without a transponder
Correction File	ATCAS II -> RCSC	CTRE	Yes	Contains ETC and violation transaction reversals, late postings, and corrections
ETC Response File	RCSC -> ATCAS II	ARES	Yes	Contains the disposition (posted to an account based on the tag status at the lane or rejected based on an error exception) for ETC transactions that were previously sent



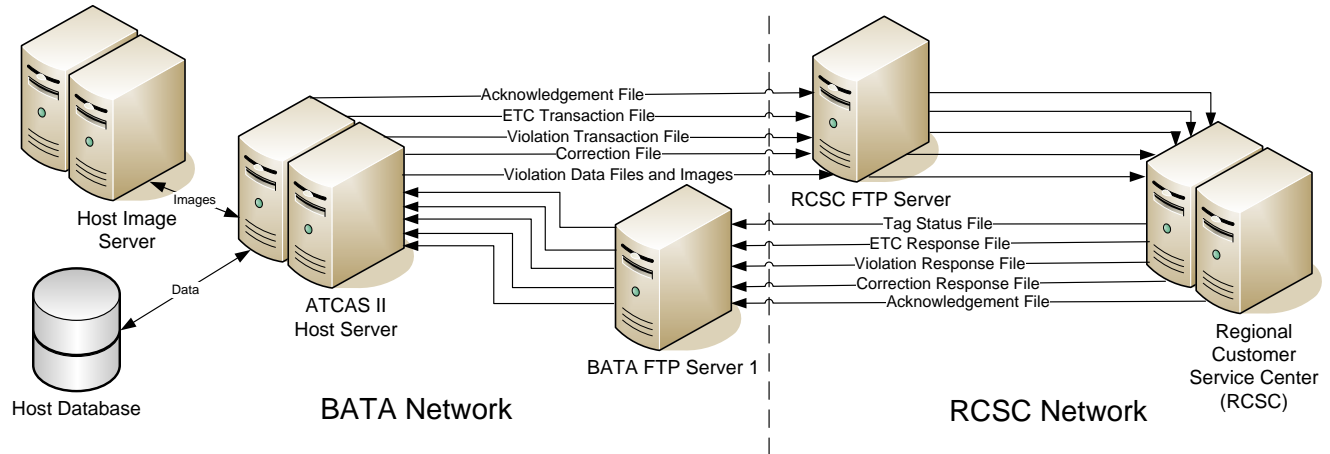
FILE	FROM -> TO	File EXT	ZIP'D	File Usage
Violation Response File	RCSC -> ATCAS II	AVRES	Yes	Contains the disposition (posted to an account based on a change in tag status or based on the violation image or rejected based on an error exception) for violation transactions that were previously sent
Correction Response File	RCSC -> ATCAS II	RTRE	Yes	Contains the disposition (posted to an account based on the tag status at the lane or rejected based on an error exception) for correction transactions that were previously sent
Acknowledgment File	Both Directions	ACK	No	Acknowledges the receipt of a file and indicates whether or not the file was valid
Violation Image Data File and Corresponding Image Files	ATCAS II -> RCSC	VDF and <img _no>	Yes (as a group)	Contains the violation image data file and the corresponding image files zipped into one file. The violation image data file name indicates the <AGENCY_ID><PLAZA_ID><LANE_ID><TRX_DATE><TRX_TIME><VEHICLE_SEQUENCE_NUMBER> so that it can be matched against the actual violation transaction. The image files have the same name as the violation image data file but with a file extension that indicates the image number.

## 22.1. Architecture Overview

The RCSC Interface system architecture is shown in Figure 22-1. Files are exchanged between the BATA FTP server and the RCSC FTP server via a dedicated WAN connection.

The architecture relies on an FTP server provided by BATA for making the file transfers. The access information for the FTP server is a configurable parameter in the tbAppiParam table.

**Figure 22-1: RCSC Interface System Architecture**



## 22.2. Business Rules

The following are the business rules for the RCSC interface:

- Data transferred between the RCSC interface processes and the RCSC are file-based.
- The RCSC interface provides transaction response files that give a disposition status for each of the ETC and violation transactions passed in the ETC transaction and violation transaction files.
- The RCSC interface process maintains a `tbRscLastTransProcessed` table for keeping track of the Host database posting date/time for the last ETC / violation transaction, the last business day approval, and the last images and violation data file that were passed to the RCSC for each plaza and lane so that the process knows at what posting date/time it should start picking up new data the next time it runs.
- Transactions assigned to different business days are not passed in the same transaction file. The file's header record indicates the business day associated with all the transactions contained in the file.
- Transaction corrections are approved for the previous business day as part of the business day approval process, the business day field is updated, and a record is inserted into the `tbBusinessDay` table. A transaction correction file is created for each business day approval and contains any adjustments that were done during the corresponding business day. Transactions from earlier business days can be cancelled or corrected in the correction file but the adjustments are applied to the business day during which the adjustments were made. Please see Chapter 8 Host System Software Section 8.9.1 Business Day Complete for more details on the business day approval process.
- The RCSC interface process only sends violation data files and images that correspond to violation transactions that have also been sent.
- The `tbTag` table is used to maintain the tag status in the local ATCAS II Host database and the individual tag status values are compared to the values in the new tag status file. When the tag status values are different, the `tbTag` table is updated. A trigger is defined for the `tbTag` table so that whenever a tag status is updated, a tag status update is inserted into the `tbSendLaneUpdate` table. The File Creator (FC) task monitors the `tbSendLaneUpdate` table and sends the tag status updates to all the lane/zone controllers as non-guaranteed messages. A new tag status file with all the current tag status values is created by FC and is downloaded to all the lane/zone controllers nightly. Table 22-2 shows the mapping between the RCSC tag and account statuses to the ATCAS II tag status and tag attribute values. Please see Chapter 8 Host System Software for more details related to the FC task.



**Table 22-2: Tag Status Mapping Between RCSC and ATCAS II**

ITEM #	RCSC				ATCAS II	
	Tag Status	Account Status	Financial status	Discount Plan	Tag Status	Attribute
1	INVENTORY	N/A	N/A	N/A	4 = Invalid	0 = Standard
2	RETURNED	N/A	N/A	N/A	4 = Invalid	0 = Standard
3	DAMAGED	N/A	N/A	N/A	4 = Invalid	0 = Standard
4	RETURNEDEF	N/A	N/A	N/A	4 = Invalid	0 = Standard
5	SHIPVEND	N/A	N/A	N/A	4 = Invalid	0 = Standard
6	TESTED	N/A	N/A	N/A	4 = Invalid	0 = Standard
7	EXPIRED	N/A	N/A	N/A	4 = Invalid	0 = Standard
8	LOST	Active	N/A	N/A	5 = Lost/Stolen	0 = Standard
9	STOLEN	Active	N/A	N/A	5 = Lost/Stolen	0 = Standard
10	ACTIVE	Active	Good Balance	Standard	0 = Valid	0 = Standard
11	ACTIVE	Active	Low Balance	Standard	1 = Low Bal	0 = Standard
12	ACTIVE	Active	Zero Balance	Standard	4 = Invalid	0 = Standard
13	ACTIVE	Active	Pending Revoked	Standard	4 = Invalid	0 = Standard
14	ACTIVE	Active	Good Balance	Non-Revenue	0 = Valid	1 = Non Rev
15	ACTIVE	Active	Low Balance	Non-Revenue	0 = Valid	1 = Non Rev
16	ACTIVE	Active	Zero Balance	Non-Revenue	0 = Valid	1 = Non Rev
17	ACTIVE	Active	Pending Revoked	Non-Revenue	0 = Valid	1 = Non Rev
18	ACTIVE	Active	Good Balance	Hybrid	0 = Valid	8 = Hybrid
19	ACTIVE	Active	Low Balance	Hybrid	1 = Low Bal	8 = Hybrid
20	ACTIVE	Active	Zero Balance	Hybrid	4 = Invalid	8 = Hybrid
21	ACTIVE	Active	Pending Revoked	Hybrid	4 = Invalid	8 = Hybrid
22	N/A	Closed	N/A	Standard	4 = Invalid	0=Standard
23	N/A	Closed	N/A	Non-Revenue	4 = Invalid	1 = Non Rev
24	N/A	Closed	N/A	Hybrid	4 = Invalid	8 = Hybrid

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1. Please explain.
2. Hybrid – is not a discount plan. Should this take preference over plans (Standard v/s Non-rev)



- a. If Non-Rev plan with Hybrid tag – ATTRIBUTE to go as Non-Rev
- b. If Standard plan with Hybrid tag – ATTRIBUTE to go as Hybrid.

## 22.3.Exchanging Data to and from the RCSC

The RCSC interface process runs on a configurable schedule to check for new ETC toll transactions, toll violation transactions, adjustments made for a closed business day, and violation images to be sent to the RCSC through the RCSC FTP Server and for new incoming files on the BATA FTP Server from the RCSC. This section defines the file transfer, the outgoing and the incoming file directory structure and the file naming conventions.

### 22.3.1.File Transfer

ATCAS II Host is responsible for picking up files from the BATA FTP Server and for dropping off files on the RCSC FTP Server. These are the same FTP servers used for ATCAS I. There is a dedicated WAN between the BATA and RCSC FTP servers and there is a firewall on both sides to prevent intrusions into the respective networks. An FTP user, password, and folder will be provided for both FTP servers so that RCSC interface can be configured to access the necessary directories on both FTP servers.

The file transfer is accomplished using FTP. The RCSC interface process initiates the sending of files into the “ATCASII/Dropbox” directory on the RCSC FTP Server and the receiving of files out of the “RCSC/Dropbox” directory on the BATA FTP Server 1. Outgoing files are transferred from the Archive/Outgoing directory on the ATCAS II Host where they are created to the ATCASII/Dropbox directory on the RCSC FTP server. It is the responsibility of the RCSC to clean up the outgoing files on the FTP server once the transfer is complete. Incoming files are transferred from the RCSC/Dropbox directory on the BATA FTP server 1 to the Archive/Incoming directory on the ATCAS II Host where files with a file type of “zip” are unzipped and the .zip file will be deleted. Transferred incoming files are deleted from the BATA FTP server 1 and the file type is used to determine how each incoming file is to be processed. The names of the FTP servers and the names of the outgoing and incoming directories on the ATCAS II host and on the FTP servers are configurable in the ATCAS II Host database.

### 22.3.2. Directory and File Naming Conventions

Below are the directory structures used by the RCSC interface process:

ID	Description	NODE	Owner	Path
1	• Ack Files From Caltrans Host	• xx.xx.xx.156	• ACS	• /ctxat2/etc
2	• Zip Files From Caltrans Host	• xx.xx.xx.156	• ACS	• /ctxat2/etc
3	• Ack Files To Caltrans Host	• TransCore Drop Box	• TransCore	• /at2xct/etc
4	• Zip Files To Caltrans Host	• TransCore Drop Box	• TransCore	• /at2xct/etc
5	• Tag Files To Caltrans Host	• TransCore Drop Box	• TransCore	• /at2xct/etc





**Table 22-3: RCSC Interface Directory Structure on the FTP Servers**

FTP server	Directory	Description
BATA FTP Server 1	/home/RCSC/Dropbox	All files received from the RCSC
RCSC FTP Server	/home/ATCASII/Dropbox	All files sent to the RCSC

The RCSC interface process pushes files to the drop box folder on the RCSC FTP server and pulls files from the drop box folder on the BATA FTP server 1.

The table below indicates the file naming conventions agreed upon with the RCSC and the initial configuration for the file location. The location of these files is configurable.

**Table 22-4: RCSC Interface Files and Naming Conventions**

FILE NAME	DESCRIPTION	LOCATION
<b>TAG STATUS FILE</b>		
YYYYMMDDHHMM.aetc and YYYYMMDDHHMM_aetc.zip after being zipped	ETC transponder statuses for all RCSC accounts and CTOC away agencies as an incoming file. YYYYMMDDHHMM represents the year, month, day, hour, and minute the file was created.	BATA FTP Server 1 RCSC/Dropbox Directory
<b>ETC TRANSACTION FILE</b>		
YYYYMMDDHHMMSS.areq and YYYYMMDDHHMMSS_areq.zip after being zipped	ETC transactions since the last ETC Transaction File generation. YYYYMMDDHHMMSS represents the year, month, day, hour, minute, and second at which the file was created.	RCSC FTP Server ATCASII/Dropbox Directory
<b>VIOLATION TRANSACTION FILE</b>		
YYYYMMDDHHMMSS.avio and YYYYMMDDHHMMSS_avio.zip after being zipped	Violation transactions since the last Violation Transaction File generation. YYYYMMDDHHMMSS represents the year, month, day, hour, minute, and second at which the file was created.	RCSC FTP Server ATCASII/Dropbox Directory
<b>TRANSACTION CORRECTION FILE</b>		
YYYYMMDDHHMMSS.ctre and YYYYMMDDHHMMSS_ctre.zip after being zipped	ETC and violation transaction corrections since the last Transaction Correction File. YYYYMMDDHHMMSS represents the year, month, day, hour, minute, and second at which the file was created.	RCSC FTP Server ATCASII/Dropbox Directory
<b>ETC RESPONSE FILE</b>		
YYYYMMDDHHMMSS.ares and YYYYMMDDHHMMSS_ares.zip after being zipped	ETC response records generated by the RCSC since the last ETC Response File.	BATA FTP Server 1 RCSC/Dropbox Directory



FILE NAME	DESCRIPTION	LOCATION
	YYYYMMDDHHMMSS represents the year, month, day, hour, minute, and second at which the file was created.	
<b>VIOLATION RESPONSE FILE</b>		
YYYYMMDDHHMMSS.avres and YYYYMMDDHHMMSS_avres.zip after being zipped	Violation response records generated by the RCSC since the last Violation Response File. YYYYMMDDHHMMSS represents the year, month, day, hour, minute, and second at which the file was created.	BATA FTP Server 1 RCSC/Dropbox Directory
<b>CORRECTION RESPONSE FILE</b>		
YYYYMMDDHHMMSS.rtre and YYYYMMDDHHMMSS_rtre.zip after being zipped	Correction response records generated by the RCSC since the last Correction Response File. YYYYMMDDHHMMSS represents the year, month, day, hour, minute, and second at which the file was created.	BATA FTP Server 1 RCSC/Dropbox Directory
<b>ACKNOWLEDGEMENT FILE</b>		
{FROM_AGENCY}_{FILE_NAME}_{FILE_TYPE}.ack	File transfer acknowledgement. {FROM_AGENCY} represents the name of the agency doing the acknowledgment, {FILE_NAME} represents the name of the file being acknowledged, and {FILE_TYPE} represents the type of file being acknowledged.	RCSC FTP Server ATCASII/Dropbox and BATA FTP Server 1 RCSC/Dropbox Directories
<b>VIOLATION DATA FILES AND IMAGES</b>		
{AGENCY_ID} {PLAZA_ID} {LANE_ID} {DATE} {TIME} {SEQ_NO}.vdf, {AGENCY_ID} {PLAZA_ID} {LANE_ID} {DATE} {TIME} {SEQ_NO}. {IMAGE_NO} }, and {AGENCY_ID} {PLAZA_ID} {LANE_ID} {DATE} {TIME} {SEQ_NO}_vdf.zip after violation data file and the corresponding images are zipped.	Violation data captured by the LPR with corresponding images. {AGENCY_ID} represents the name of the agency (i.e. "CAL"), {PLAZA_ID} represents the plaza ID where the transaction occurred, {LANE_ID} represents the lane where the transaction occurred, {DATE} {TIME} represents the year, month, day, hour, minute, second, and tick at which transaction occurred, {SEQ_NO} represents the transaction sequence number, and {IMAGE_NO} represents the image number.	RCSC FTP Server ATCASII/Dropbox Directory

## 22.4. File Layouts and Validation

The files to be sent to and from the RCSC are flat files with fixed length records. The file layouts and validation steps are presented in the sections that follow.

### 22.4.1. Tag Status File Received from the RCSC

The tag status file that is received from the RCSC at configurable intervals consists of a header record, followed by a detail record for each transponder (tag), and then followed by a trailer record. The record formats are shown in the following tables.

**Table 22-5: Tag Status File Received from the RCSC (Header Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 7	RECORD_TYPE	7	“#HEADER”
2	8	FILLER_1	1	<comma> separator (“,”)
3	9 – 12	FILE_TYPE	4	”AETC“
4	13	FILLER_2	1	<comma> separator (“,”)
5	14 – 19	SEQUENCE_NO	6	Unique sequence number for the ETC Tag Status File. Incremented with the creation of each file. (000000 – 999999)
6	20	FILLER_3	1	<comma> separator (“,”)
7	21 – 30	BUSINESS_DATE	10	Business Date (MM/DD/YYYY) – same as File Creation Date
8	31	FILLER_4	1	<comma> separator (“,”)
9	32 – 33	SOURCE	2	“RC”
10	34	FILLER_5	1	<comma> separator (“,”)
11	35 – 36	DESTINATION	2	“AT”
12	37	FILLER_6	1	<comma> separator (“,”)
13	38 – 47	CREATE_DATE	10	File Creation Date (MM/DD/YYYY)
14	48	FILLER_7	1	<comma> separator (“,”)
15	49 – 56	CREATE_TIME	8	File Creation Time (HH:MM:SS)
16	<b>57</b>	<b>LINEFEED</b>	<b>1</b>	<line feed>

**Table 22-6: Tag Status File Received from the RCSC (Detail Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 4	ETC_TAG_ID	<b>4</b>	CTOC Tag ID (0000 – 1023)
2	5	FILLER_1	<b>1</b>	< comma> separator (“,”)

Field	Position	Name	Length	Description / Contents
3	6 – 11	ETC_TAG_FAC_CODE	6	CTOC Facility Code (000000 – 262143)
4	12	FILLER_2	1	< comma > separator (“;”)
5	13	TOL_TAG_TYPE	1	Four Bit Tag Type read from the ETC transponder in hexadecimal (0 – F): “0” = CTOC transponder Possible future use for switchable transponders: “1” = HOV2 “5” = HOV3
6	14	FILLER_3	1	<comma> separator (“;”)
7	15	ETC_TAG_STATUS	1	ATCAS II Tag Status (“0” indicates valid, “1” indicates low balance, “4” indicates invalid, and “5” indicates lost/stolen)
8	16	FILLER_4	1	< comma > separator (“;”)
9	17	ETC_TAG_ATTRIBUTE	1	ATCAS II Tag Attribute (“0” indicates standard, “1” indicates non-revenue, and “8” indicates hybrid)
11	18	LINEFEED	1	<line feed>

Table 22-7: Tag Status File Received from the RCSC (Trailer Record)

Field	Position	Name	Length	Description / Contents
1	1 – 8	RECORD_TYPE	8	<ul style="list-style-type: none"> <li>“#TRAILER”</li> </ul>
2	9	FILLER_1	1	<ul style="list-style-type: none"> <li>&lt;comma&gt; separator (“;”)</li> </ul>
3	10 – 15	SEQUENCE_NO	6	<ul style="list-style-type: none"> <li>Same as Header Record SEQUENCE_NO</li> </ul>
4	16	FILLER_2	1	<ul style="list-style-type: none"> <li>&lt;comma&gt; separator (“;”)</li> </ul>
5	17 – 26	FILE_DATE	10	<ul style="list-style-type: none"> <li>Same as Header Record CREATE_DATE</li> </ul>
6	27	FILLER_3	1	<ul style="list-style-type: none"> <li>&lt;comma&gt; separator (“;”)</li> </ul>
7	28 – 35	DETAIL_COUNT	8	<ul style="list-style-type: none"> <li>Count of all tag statuses contained in the detail records (00000000 – 99999999)</li> </ul>
8	36	FILLER_4	1	<ul style="list-style-type: none"> <li>&lt;comma&gt; separator (“;”)</li> </ul>
9	37 - 46	DETAIL_TRANS_AMOUNT	10	<ul style="list-style-type: none"> <li>Total amount for all records in the file (Sum of TOL_FARE_ETC_AMT in cents)</li> </ul>



Field	Position	Name	Length	Description / Contents
10	47	LINEFEED	1	<ul style="list-style-type: none"> <li>&lt;line feed&gt;</li> </ul>

### 22.4.1.1.RCSC Processing Requirements

- The first comprehensive tag download file is pushed to the drop box folder on the BATA FTP server no later than 04:00. All subsequent comprehensive tag download files are sent in 6 hour intervals (i.e., the first tag file no later than 04:00, then 10:00, 16:00, and 22:00).
- In the event that an invalid detail record is encountered (e.g., invalid ETC\_TAG\_STATUS or ETC\_TAG\_ATTRIBUTE value), the ATCAS II Host skips the complete file and notifies the RCSC via the Acknowledgement File. See Section 0
- Incoming File Validation
- .
- The ETC\_TAG\_STATUS and ETC\_TAG\_ATTRIBUTE values are downloaded to the lane/zone controllers at the BATA bridges by the ATCAS II host through the ATCAS II plaza computers so that customers can be notified of the tag’s status and can be charged the correct toll amount based on the tag’s attributes. The tag status messages displayed on the Patron Fare Display (PFD) and the amount charged based on the tag’s attributes are configurable at the ATCAS II host and can be modified by authorized BATA employees.
- Should the RCSC fail to send a tag download file as required, the previous tag status and attribute values continue to be used and an alarm is issued. See Section 0
- Error Processing
- .
- The ATCAS II Host performs the appropriate sanity checks on the Tag Status File prior to its transmission to the lanes such as checking for an unusual increase or decrease in the number of tags from previous version.
- See Section 0
- Incoming File Validation
- for more details.

### 22.4.2.ETC Transaction File Sent to the RCSC

The ETC transaction file that is generated at configurable intervals and sent to the RCSC consists of a header record, followed by a detail record for each ETC transaction in the batch, then followed by a trailer record. ETC transactions are reported for the Business Day that is equal to the date that the ETC transponder was read in the toll zone. The only exception is in the case of buffered and flushed tag reads and other adjustments to revenue that are reported for the Business Day that is equal to the day that the adjustments were made. The record formats are shown in the following tables.

**Table 22-8: ETC Transaction File Sent to the RCSC (Header Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 7	RECORD_TYPE	7	<ul style="list-style-type: none"> <li>“#HEADER”</li> </ul>
• 2	8	FILLER_1	1	<ul style="list-style-type: none"> <li>&lt;comma&gt; separator (“;”)</li> </ul>



Field	Position	Name	Length	Description / Contents
• 3	9 – 12	FILE_TYPE	4	• ”REQ “
• 4	13	FILLER_2	1	• <comma> separator (“;”)
• 5	14 – 19	SEQUENCE_NO	6	• Unique sequence number for the ETC Transaction File. Incremented with the creation of each file. (000000 – 999999)
• 6	20	FILLER_3	1	• <comma> separator (“;”)
• 7	21 – 30	BUSINESS_DATE	10	• Business Date – midnight to midnight (MM/DD/YYYY)
• 8	31	FILLER_4	1	• <comma> separator (“;”)
• 9	32 – 33	SOURCE	2	• “AT”
• 10	34	FILLER_5	1	• <comma> separator (“;”)
• 11	35 – 36	DESTINATION	2	• “RC”
• 12	37	FILLER_6	1	• <comma> separator (“;”)
• 13	38 – 47	CREATE_DATE	10	• File Creation Date (MM/DD/YYYY)
• 14	48	FILLER_7	1	• <comma> separator (“;”)
• 15	49 – 56	CREATE_TIME	8	• File Creation Time (HH:MM:SS)
• 16	57	LINEFEED	1	• <line feed>

**Table 22-9: ETC Transaction File Sent to the RCSC (Detail Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 10	TRANSACTION_NUMBER	10	• Unique transaction number assigned to the transaction being sent from the iSentTransId identity field in the tbRcscSendTrans table and used to identify the transaction in the ETC response file (0000000000 – 9999999999)
• 2	11	FILLER_1	1	• <comma> separator (“;”)
• 3	12	TOL_TRX_TYPE	1	• Type of transaction. “1” = ETC “3” = Carpool “4” = Non-Revenue “5” = Hybrid “6” = HOV2 “7” = HOV3

Field	Position	Name	Length	Description / Contents
• 4	13	FILLER_2	1	• <comma> separator (“,”)
• 5	14 – 17	TOL_TAG_ID	4	• Tag ID in accordance with the Title-21 specs (0000 – 1023)
• 6	18	FILLER_3	1	• <comma> separator (“,”)
• 7	19 – 24	TOL_TAG_FACILITY_ID	6	• Facility Code assigned to issuing agency in accordance with the Title-21 specs (000000 – 262143)
• 8	25	FILLER_4	1	• <comma> separator (“,”)
• 9	26	TOL_TAG_TYPE	1	• Four Bit Tag Type read from the ETC transponder in hexadecimal (0 – F): “0” = CTOC transponder Possible future use for switchable transponders: “1” = HOV2 “5” = HOV3
• 10	27	FILLER_5	1	• <comma> separator (“,”)
• 11	28 – 30	TOL_PLAZA_ID	3	• Plaza ID where the transaction occurred that is part of the unique key needed to identify the transaction. Needs to be converted to the name of the corresponding bridge by the RCSC on the customer statement as follows: “002” = “ANTIOCH” “003” = “RICHMOND” “004” = “BAY BRIDGE” “005” = “SAN MATEO” “006” = “DUMBARTON” “007” = “CARQUINEZ” “008” = “BENICIA”
• 12	31	FILLER_6	1	• <comma> separator (“,”)
• 13	32 – 33	TOL_LANE_ID	2	• Lane number where the transaction occurred that is part of the unique key needed to identify the transaction (00 – 99) and is shown on the customer’s statement
• 14	34	FILLER_7	1	• <comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 15	35 – 44	TOL_TRX_DATE	10	• Date portion of the timestamp for the transaction that shows when the transaction occurred on the customer’s statement (MM/DD/YYYY)
• 16	45	FILLER_8	1	• <comma> separator (“,”)
• 17	46 – 53	TOL_TRX_TIME	8	• Time portion of the timestamp for the transaction that shows when the transaction occurred on the customer’s statement (HH:MM:SS)
• 18	54	FILLER_9	1	• <comma> separator (“,”)
• 19	55 – 59	TOL_FARE_ETC_AMT	5	• ETC fare amount to charge in number of cents (00000 – 99999). This is the amount passed from the lane as revenue_collected in the vehicle transaction.
• 20	60	FILLER_10	1	• <comma> separator (“,”)
• 21	61 – 65	TOL_FARE_CASH_AMT	5	• Cash fare amount to charge in number of cents (always 00000)
• 22	66	FILLER_11	1	• <comma> separator (“,”)
• 23	67 – 74	TOL_FARE_ID	8	• Fare Definition ID that was used in the toll lookup followed by a 5 digit number of seconds from the beginning of the day when the time of day pricing interval started (00100000 – 99999999)
• 24	75	FILLER_12	1	• <comma> separator (“,”)
• 25	76 – 77	TOL_MSG_FLAG	2	• Indicates whether or not the transaction was a buffered tag read (“1” = not a buffered tag read, “2” = buffered tag read)
• 26	78	FILLER_13	1	• <comma> separator (“,”)
• 27	79 – 80	AVC_CLASS_ID	2	• Class based on the axles counted by the AVC (“02” = 2 axle vehicle, “03” = 3 axle vehicle, “04” = 4 axle vehicle, “05” = 5 axle vehicle, “06” = 6 axle vehicle, “07” = 7 axle vehicle, and “08” = 8 or more axle vehicle)





Field	Position	Name	Length	Description / Contents
• 28	81	FILLER_14	1	• <comma> separator (“,”)
• 29	82 – 89	LANE_TX_SEQUENCE_NUMBER	8	• Unique vehicle sequence number assigned to the vehicle transaction by the lane/zone controller (VEH_SEQUENCE_NO) which can be combined with the plaza id and lane number to uniquely identify the transaction (00000000 – 99999999)
• 30	90	FILLER_15	1	• <comma> separator (“,”)
• 31	91	TOL_TAG_STATUS	1	• ATCAS II Tag Status at the lane at the time of the tag read (“0” indicates valid and “1” indicates low balance)
• 32	92	FILLER_16	1	• <comma> separator (“,”)
• 33	93	TOL_DST_FLAG	1	• Indicates daylight saving time (“0” = standard time and “1” = daylight savings time)
• 34	94	FILLER_17	1	• <comma> separator (“,”)
• 35	95 – 97	TOL_TRX_SPEED	3	• Transaction speed as reported by the lane (Default 000)
• 36	98	FILLER_18	1	• <comma> separator (“,”)
• 37	99 – 100	RESOLV_CODE	2	• 00
• 38	101	LINEFEED	1	• <line feed>

**Table 22-10: ETC Transaction File Sent to the RCSC (Trailer Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 8	RECORD_TYPE	8	• “#TRAILER”
• 2	9	FILLER_1	1	• <comma> separator (“,”)
• 3	10 – 15	SEQUENCE_NO	6	• Same as Header Record SEQUENCE_NO
• 4	16	FILLER_2	1	• <comma> separator (“,”)
• 5	17 – 26	FILE_DATE	10	• Same as Header Record CREATE_DATE
• 6	27	FILLER_3	1	• <comma> separator (“,”)
• 7	28 – 35	DETAIL_COUNT	8	• Count of all transactions contained in the detail records (00000000 – 99999999)

Field	Position	Name	Length	Description / Contents
• 8	36	FILLER_4	1	• <comma> separator (“,”)
• 9	37 - 46	DETAIL_TRANS_ AMOUNT	10	• Total amount for all records in the file (Sum of TOL_FARE_ETC_AMT in cents)
• 10	47	LINEFEED	1	• <line feed>

### 22.4.2.1.RCSC Processing Requirements

- The RCSC receives and processes ETC Transaction Files from the ATCAS II Host multiple times a day at predetermined intervals (i.e., the ATCAS II host is configured to send an ETC Transaction File every 3 hours at 00:00, 03:00, 06:00, 09:00, 12:00, 15:00, 18:00, and 21:00).
- ETC transactions in this file have a unique transaction number for each record in the file.
- All transactions coming in through this interface are processed and the resolve code values are ignored.
- RCSC can process multiple transaction type (TOL\_TRX\_TYPE) values in a single file. All transaction types are processed as ETC transactions but the transaction type value is saved for future summarization of transaction data in reports.
- The tag type (TOL\_TAG\_TYPE), fare id (TOL\_FARE\_ID), and transaction class (AVC\_CLASS\_ID) values are also saved for future summarization of transaction data in reports.
- The RCSC ensures, upon processing, that the ETC Transaction File does not contain two (or more) transactions for the same TOL\_TAG\_ID/TOL\_TAG\_AGENCY\_ID combination in the same TOL\_PLAZA\_ID/TOL\_LANE\_ID within a one (1) minute period. However, this parameter is configurable at the RCSC based on business rule decisions between the RCSC and ATCAS II Host.
- The RCSC performs sanity checks on the ETC Transaction File to look for formatting errors, record count mismatches between header and detail records, etc. In the event the file fails on these sanity checks, the RCSC notifies the ATCAS II Host of the anomaly by means of the acknowledgment file. See Section 0, the RETURN\_CODE value.
- If the RCSC determines an error in a detail record, the RCSC rejects the transaction record with the error, processes the remainder of the transaction file, and notifies the ATCAS II Host of the error via the ETC response file. The ETC response file has a corresponding error and reason code indicative of the error. See Sections 0 and 0.
- The RCSC always charges the ETC toll amount received from the ATCAS II Host. The toll amount calculated at the ATCAS II Host as supplied in the TOL\_FARE\_ETC\_AMT field of the transaction file is used to debit the BATA Regional CSC accounts. This includes the toll amount due for non-revenue customers (ATCAS II sends 00000 in the TOL\_FARE\_ETC\_AMT field for non-revenue customers).
- The RCSC has the capability of rejecting a transaction based on the age of the transaction. This is a configurable value and is set to 365 days for all incoming transactions from the ATCAS II Host. This value can be changed as requested by BATA.



- The business date (BUSINESS\_DATE) is set to the calendar day in which the transaction occurred at the lane. The only exception is when transactions are sent as the result of an adjustment that is made at the ATCAS II host after the business day has been closed at the ATCAS II host. In this case, the business date is set to the calendar day in which the adjustment occurred at the ATCAS II host.
- All transactions contained in the ETC transaction file have the same transaction date (TOL\_TRX\_DATE) value. When the business date does not match the transaction dates contained in the file, this indicates that transactions are from an adjustment made at the ATCAS II host and that the business day indicates the calendar day in which the adjustment was made.

### 22.4.1.Violation Transaction File Sent to the RCSC

The violation transaction file that is generated at configurable intervals and sent to the RCSC consists of a header record, followed by a detail record for each violation transaction in the batch, and then followed by a trailer record. Violation transactions are reported for the Business Day that is equal to the date that the vehicle exited the toll zone. The record formats are shown in the following tables.

**Table 22-11: Violation Transaction File Sent to the RCSC (Header Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 7	RECORD_TYPE	7	“#HEADER”
• 2	8	FILLER_1	1	<comma> separator (“,”)
• 3	9 – 12	FILE_TYPE	4	”VIO “
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14 – 19	SEQUENCE_NO	6	Unique sequence number for the Violation Transaction File. Incremented with the creation of each file. (000000 – 999999)
• 6	20	FILLER_3	1	<comma> separator (“,”)
• 7	21 – 30	BUSINESS_DATE	10	Business Date – midnight to midnight (MM/DD/YYYY)
• 8	31	FILLER_4	1	<comma> separator (“,”)
• 9	32 – 33	SOURCE	2	“AT”
• 10	34	FILLER_5	1	<comma> separator (“,”)
• 11	35 – 36	DESTINATION	2	“RC”
• 12	37	FILLER_6	1	<comma> separator (“,”)
• 13	38 – 47	CREATE_DATE	10	File Creation Date (MM/DD/YYYY)
• 14	48	FILLER_7	1	<comma> separator (“,”)
• 15	49 – 56	CREATE_TIME	8	File Creation Time (HH:MM:SS)
• 16	57	LINEFEED	1	<line feed>

**Table 22-12: Violation Transaction File Sent to the RCSC (Detail Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 10	TRANSACTION_NUMBER	10	Unique transaction number assigned to the transaction being sent from the iSentTransId identity field in the tbRcscSendTrans table and used to identify the transaction in the violation response file (0000000000 – 9999999999)
• 2	11	FILLER_1	1	<comma> separator (“,”)
• 3	12	TOL_TRX_TYPE	1	Type of transaction. “2” = Violation
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14 – 17	TOL_TAG_ID	4	Tag ID in accordance with the Title-21 specs (0000 – 1023) or <blank> if no tag was read
• 6	18	FILLER_3	1	<comma> separator (“,”)
• 7	19 – 24	TOL_TAG_FACILITY_ID	6	Facility Code assigned to issuing agency in accordance with the Title-21 specs (000000 – 262143) or <blank> if no tag was read
• 8	25	FILLER_4	1	<comma> separator (“,”)
• 9	26	TOL_TAG_TYPE	1	Four Bit Tag Type read from the ETC transponder in hexadecimal (0 – F): “0” = CTOC transponder Possible future use for switchable transponders: “1” = HOV2 “5” = HOV3
• 10	27	FILLER_5	1	<comma> separator (“,”)
• 11	28 – 30	TOL_PLAZA_ID	3	Plaza ID where the transaction occurred that is part of the unique key needed to identify the transaction. Needs to be converted to the name of the corresponding bridge by the RCSC on the customer statement as follows: “002” = “ANTIOCH” “003” = “RICHMOND” “004” = “BAY BRIDGE” “005” = “SAN MATEO” “006” = “DUMBARTON” “007” = “CARQUINEZ” “008” = “BENICIA”
• 12	31	FILLER_6	1	<comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 13	32 – 33	TOL_LANE_ID	2	Lane number where the transaction occurred that is part of the unique key needed to identify the transaction (00 – 99) and is shown on the customer statement
• 14	34	FILLER_7	1	<comma> separator (“,”)
• 15	35 – 44	TOL_TRX_DATE	10	Date portion of the timestamp for the transaction that shows when the transaction occurred on the customers statement (MM/DD/YYYY)
• 16	45	FILLER_8	1	<comma> separator (“,”)
• 17	46 – 53	TOL_TRX_TIME	8	Time portion of the timestamp for the transaction that shows when the transaction occurred on the customers statement (HH:MM:SS)
• 18	54	FILLER_9	1	<comma> separator (“,”)
• 19	55 – 59	TOL_FARE_ETC_AMT	5	ETC fare amount to charge in number of cents (00000 – 99999). The ETC fare amount is looked up from the database based on the fare definition that was active at the time of the transaction as indicated in the fare_id value passed from the lane in the vehicle transaction. If the transaction is part of a tour that was in a dedicated carpool mode then the ETC_CARPOOL fare amount is used. This is the amount posted to the ETC account when the violation is converted to an ETC transaction by the RCSC.
• 20	60	FILLER_10	1	<comma> separator (“,”)
• 21	61 – 65	TOL_FARE_CASH_AMT	5	Cash fare amount to charge in number of cents (00000 – 99999). This is the amount passed from the lane as revenue_expected in the vehicle transaction.
• 22	66	FILLER_11	1	<comma> separator (“,”)
• 23	67 – 74	TOL_FARE_ID	8	Fare Definition ID that was used in the toll lookup followed by a 5 digit number of seconds from the beginning of the day when the time of day pricing interval started (00100000 – 99999999)



Field	Position	Name	Length	Description / Contents
• 24	75	FILLER_12	1	<comma> separator (“,”)
• 25	76 – 77	TOL_MSG_FLAG	2	Indicates whether or not the transaction was a buffered tag read (“1” = not a buffered tag read, “2” = buffered tag read)
• 26	78	FILLER_13	1	<comma> separator (“,”)
• 27	79 – 80	AVC_CLASS_ID	2	Class based on the axles counted by the AVC (“02” = 2 axle vehicle, “03” = 3 axle vehicle, “04” = 4 axle vehicle, “05” = 5 axle vehicle, “06” = 6 axle vehicle, “07” = 7 axle vehicle, and “08” = 8 or more axle vehicle)
• 28	81	FILLER_14	1	<comma> separator (“,”)
• 29	82 – 89	LANE_TX_SEQUENCE_NUMBER	8	Unique vehicle sequence number assigned to the vehicle transaction (VEH_SEQUENCE_NO) which can be combined with the plaza id and lane number to uniquely identify the transaction (00000000 – 99999999)
• 30	90	FILLER_15	1	<comma> separator (“,”)
• 31	91	TOL_TAG_STATUS	1	ATCAS II Tag Status at the lane at the time of the tag read (“4” indicates invalid and “5” indicates lost/stolen) or <blank> if no tag was read
• 32	92	FILLER_16	1	<comma> separator (“,”)
• 33	93	TOL_DST_FLAG	1	Indicates daylight saving time (“0” = standard time and “1” = daylight savings time)
• 34	94	FILLER_17	1	<comma> separator (“,”)
• 35	95 – 97	TOL_TRX_SPEED	3	Transaction speed as reported by the lane (Default 000)
• 36	98	FILLER_18	1	<comma> separator (“,”)
• 37	99 – 100	RESOLV_CODE	2	02
38	101	LINEFEED	1	<line feed>

**Table 22-13: Violation Transaction File Sent to the RCSC (Trailer Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 8	RECORD_TYPE	8	“#TRAILER”

Field	Position	Name	Length	Description / Contents
2	9	FILLER_1	1	<comma> separator (“,”)
3	10 – 15	SEQUENCE_NO	6	Same as Header Record SEQUENCE_NO
4	16	FILLER_2	1	<comma> separator (“,”)
5	17 – 26	FILE_DATE	10	Same as Header Record CREATE_DATE
6	27	FILLER_3	1	<comma> separator (“,”)
7	28 – 35	DETAIL_COUNT	8	Count of all transactions contained in the detail records (00000000 – 99999999)
8	36	FILLER_4	1	<comma> separator (“,”)
9	37 - 46	DETAIL_TRANS_ AMOUNT	10	Total amount for all records in the file (Sum of TOL_FARE_ETC_AMT in cents)
10	47	LINEFEED	1	<line feed>

#### 22.4.1.1.RCSC Processing Requirements

- The RCSC is capable of receiving and processing Violation Transaction Files from the ATCAS II Host multiple times a day (i.e., the ATCAS II host is configured to send a Violation Transaction File every 3 hours at 00:00, 03:00, 06:00, 09:00, 12:00, 15:00, 18:00, and 21:00).
- Violation transactions in this file have a unique transaction number for each record in the file.
- The transaction type (TOL\_TRX\_TYPE), tag type (TOL\_TAG\_TYPE), fare id (TOL\_FARE\_ID), and transaction class (AVC\_CLASS\_ID) values are saved for future summarization of transaction data in reports.
- The RCSC performs sanity checks on the Violation Transaction File to look for formatting errors, record count mismatches between header and detail records, etc. In the event the file fails on these sanity checks, the RCSC notifies the ATCAS II Host of the anomaly by means of the acknowledgment file. See Section 0, the RETURN\_CODE value.
- If the RCSC determines an error in a detail record, the RCSC rejects the transaction record with the error, processes the remainder of the transaction file, and notifies the ATCAS II Host of the error via the violation response file. The violation response file has a corresponding error and reason code indicative of the error. See Sections 0 and 0.
- The RCSC uses the toll amount as supplied in the TOL\_FARE\_CASH\_AMT field to process violations. All postable transactions use the amount in the TOL\_FARE\_ETC\_AMT field, while transactions that are eligible for notice escalation use the amount in the TOL\_FARE\_CASH\_AMT field.
- The RCSC has the capability of rejecting a transaction based on the age of the transaction. This is a configurable value and is set to 365 days for all incoming transactions from the ATCAS II Host. This value can be changed as requested by BATA.
- The business date (BUSINESS\_DATE) is set to the calendar day in which the transaction occurred at the lane. The only exception is when transactions are sent as the result of an adjustment that is made



at the ATCAS II host after the business day has been closed at the ATCAS II host. In this case, the business date is set to the calendar day in which the adjustment occurred at the ATCAS II host.

- All transactions contained in the ETC transaction file have the same transaction date (TOL\_TRX\_DATE) value. When the business date does not match the transaction dates contained in the file, this indicates that transactions are from an adjustment made at the ATCAS II host and that the business day indicates the calendar day in which the adjustment was made.

### 22.4.2. Transaction Correction File Sent to the RCSC

The transaction correction file is generated once following the end of each business day closure when there are transaction corrections or reversals associated with the business day and is sent to the RCSC. This file consists of a header record, followed by a detail record for each transaction adjustment in the batch, and then followed by a trailer record. Detail records are only sent when there is a change in the ETC fare amount. Refer to Chapter 8 Section 8.9 Financial Management for details related to the closing out the business day and Section 8.9.5 Adjustment for details regarding how adjustments are made. The record formats are shown in the following tables.

**Table 22-14: Transaction Correction File Sent to the RCSC (Header Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 7	RECORD_TYPE	7	• “#HEADER”
• 2	8	FILLER_1	1	• <comma> separator (“,”)
• 3	9 – 12	FILE_TYPE	4	• ”CTRE“
• 4	13	FILLER_2	1	• <comma> separator (“,”)
• 5	14 – 19	SEQUENCE_NO	6	• Unique sequence number for the Transaction Correction File. Incremented with the creation of each file. (000000 – 999999)
• 6	20	FILLER_3	1	• <comma> separator (“,”)
• 7	21 – 30	BUSINESS_DATE	10	• Business Date – midnight to midnight (MM/DD/YYYY)
• 8	31	FILLER_4	1	• <comma> separator (“,”)
• 9	32 – 33	SOURCE	2	• “AT”
• 10	34	FILLER_5	1	• <comma> separator (“,”)
• 11	35 – 36	DESTINATION	2	• “RC”
• 12	37	FILLER_6	1	• <comma> separator (“,”)
• 13	38 – 47	CREATE_DATE	10	• File Creation Date (MM/DD/YYYY)
• 14	48	FILLER_7	1	• <comma> separator (“,”)
• 15	49 – 56	CREATE_TIME	8	• File Creation Time (HH:MM:SS)
• 16	57	LINEFEED	1	• <line feed>





**Table 22-15: Transaction Correction File Sent to the RCSC (Detail Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 10	TRANSACTION_NUMBER	10	Unique transaction number assigned to the transaction being sent from the iSentTransId identity field in the tbRcscSendTrans table used to identify the correction transaction (0000000000 – 9999999999)
• 2	11	FILLER_1	1	<comma> separator (“,”)
• 3	12	TOL_TRX_TYPE	1	Type of transaction being corrected. “1” = ETC “2” = Violation “3” = Carpool “4” = Non-Revenue “5” = Hybrid “6” = HOV2 “7” = HOV3
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14	TOL_TRX_TYPE_CORR	1	New corrected type of transaction (when different than TOL_TRX_TYPE). “1” = ETC “2” = Violation “3” = Carpool “4” = Non-Revenue “5” = Hybrid “6” = HOV2 “7” = HOV3
• 6	15	FILLER_3	1	<comma> separator (“,”)
• 7	16	TOL_CORRECTION_FLAG	1	Type of correction. “A” = Amount only “T” = Transaction Type, Fare ID, or AVC Class ID correction
• 8	17	FILLER_4	1	<comma> separator (“,”)
• 9	18 – 21	TOL_TAG_ID	4	Tag ID in accordance with the Title-21 specs (0000 – 1023) or <blank> if no tag was read
• 10	22	FILLER_5	1	<comma> separator (“,”)
• 11	23 – 28	TOL_TAG_FACILITY_ID	6	Facility Code assigned to issuing agency in accordance with the Title-21 specs (000000 – 262143) or <blank> if no tag was read
• 12	29	FILLER_6	1	<comma> separator (“,”)

Field	Position	Name	Length	Description / Contents
• 13	31	TOL_TAG_TYPE	1	Four Bit Tag Type read from the ETC transponder in hexadecimal (0 – F): “0” = CTOC transponder Possible future use for switchable transponders: “1” = HOV2 “5” = HOV3
• 14	31	FILLER_7	1	<comma> separator (“,”)
• 15	32 – 34	TOL_PLAZA_ID	3	Plaza ID where the transaction being cancelled or corrected occurred that is part of the unique key needed to identify the transaction “002” = “ANTIOCH” “003” = “RICHMOND” “004” = “BAY BRIDGE” “005” = “SAN MATEO” “006” = “DUMBARTON” “007” = “CARQUINEZ” “008” = “BENICIA”
• 16	35	FILLER_8	1	<comma> separator (“,”)
• 17	36 – 37	TOL_LANE_ID	2	Lane number where the transaction being cancelled or corrected occurred that is part of the unique key needed to identify the transaction
• 18	38	FILLER_9	1	<comma> separator (“,”)
• 19	39 – 48	TOL_TRX_DATE	10	Date portion of the timestamp for the transaction that shows when the transaction being cancelled or corrected occurred (MM/DD/YYYY)
• 20	49	FILLER_10	1	<comma> separator (“,”)
• 21	50 – 57	TOL_TRX_TIME	8	Time portion of the timestamp for the transaction that shows when the transaction being cancelled or corrected occurred (HH:MM:SS)
• 22	58	FILLER_11	1	<comma> separator (“,”)
• 23	59 – 63	TOL_FARE_ETC_AMT	5	ETC fare amount to reverse in the transaction being corrected in number of cents (00000 – 99999).
• 24	64	FILLER_12	1	<comma> separator (“,”)

Field	Position	Name	Length	Description / Contents
• 25	65 – 69	TOL_FARE_CORR_ETC_AMT	5	New ETC fare amount to charge in number of cents (00000 – 99999). A new ETC fare amount = 00000 indicates the original transaction is being reversed.
• 26	70	FILLER_13	1	<comma> separator (“,”)
• 27	71 – 75	TOL_FARE_CASH_AMT	5	Cash fare amount to reverse in the transaction being corrected in number of cents (always 00000)
• 28	76	FILLER_14	1	<comma> separator (“,”)
• 29	77 – 81	TOL_FARE_CORR_CASH_AMT	5	New cash fare amount to charge in number of cents (00000 – 99999). A new cash fare amount = 00000 indicates the original transaction is being reversed.
• 30	82	FILLER_15	1	<comma> separator (“,”)
• 31	83 – 90	TOL_FARE_ID	8	Fare Definition ID that was used in the toll lookup charge in the transaction being corrected followed by a 5 digit number of seconds from the beginning of the day when the time of day pricing interval started (00100000 – 99999999)
• 32	91	FILLER_16	1	<comma> separator (“,”)
• 33	92 – 99	TOL_FARE_CORR_ID	8	New Fare Definition ID (when different than TOL_FARE_ID) that was used in the toll lookup followed by a 5 digit number of seconds from the beginning of the day when the time of day pricing interval started (00100000 – 99999999)
• 34	100	FILLER_17	1	<comma> separator (“,”)
• 35	101 – 102	TOL_MSG_FLAG	2	Indicates whether or not the transaction was a buffered tag read (“1” = not a buffered tag read, “2” = buffered tag read)
• 36	103	FILLER_18	1	<comma> separator (“,”)

Field	Position	Name	Length	Description / Contents
• 37	104 – 105	AVC_CLASS_ID	2	Class based on the axles counted by the AVC charge in the transaction being corrected (“02” = 2 axle vehicle, “03” = 3 axle vehicle, “04” = 4 axle vehicle “05” = 5 axle vehicle, “06” = 6 axle vehicle, “07” = 7 axle vehicle, and “08” = 8 or more axle vehicle)
• 38	106	FILLER_19	1	<comma> separator (“,”)
• 39	107 – 109	AVC_CLASS_ID_CORR	2	New Class based on the axles counted by the AVC (when different than TOL_CLASS_ID). (“02” = 2 axle vehicle, “03” = 3 axle vehicle, “04” = 4 axle vehicle “05” = 5 axle vehicle, “06” = 6 axle vehicle, “07” = 7 axle vehicle, and “08” = 8 or more axle vehicle)
• 40	109	FILLER_20	1	<comma> separator (“,”)
• 41	110 – 117	LANE_TX_SEQUENCE_NUMBER	8	Unique vehicle sequence number assigned to the vehicle transaction by the lane/zone controller (VEH_SEQUENCE_NO) which can be combined with the plaza id and lane number to uniquely identify the transaction (00000000 – 99999999)
• 42	118	FILLER_21	1	<comma> separator (“,”)
• 43	119	TOL_TAG_STATUS	1	ATCAS II Tag Status at the lane at the time of the tag read (“0” indicates valid and “1” indicates low balance “4” indicates invalid and “5” indicates lost/stolen) or <blank> if no tag was read
• 44	120	FILLER_22	1	<comma> separator (“,”)
• 45	121	TOL_DST_FLAG	1	Indicates daylight saving time (“0” = standard time and “1” = daylight savings time)
• 46	123	FILLER_23	1	<comma> separator (“,”)
• 47	124 – 126	TOL_TRX_SPEED	3	Transaction speed as reported by the lane (Default 000)
• 48	127	FILLER_24	1	<comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 49	128 – 137	ORIG_TRX_NUMBER	10	Transaction number assigned to the original transaction being corrected (0000000000 – 9999999999)
• 50	138	FILLER_25	1	<comma> separator (“,”)
• 51	139 – 140	RESOLV_CODE	2	00
• 52	141	LINEFEED	1	<line feed>

**Table 22-16: Transaction Correction File Sent to the RCSC (Trailer Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 8	RECORD_TYPE	8	“#TRAILER”
• 2	9	FILLER_1	1	<comma> separator (“,”)
• 3	10 – 15	SEQUENCE_NO	6	Same as Header Record SEQUENCE_NO
• 4	16	FILLER_2	1	<comma> separator (“,”)
• 5	17 – 26	FILE_DATE	10	Same as Header Record CREATE DATE
• 6	27	FILLER_3	1	<comma> separator (“,”)
• 7	28 – 35	DETAIL_COUNT	8	Count of all cancellations and corrections contained in the detail records (00000000 – 99999999)
• 8	36	FILLER_4	1	<comma> separator (“,”)
• 9	37 - 46	DETAIL_TRANS_AMOUNT	10	Total new amount for all records in the file (Sum of TOL_FARE_CORR_ETC_AMT in cents)
• 10	47	LINEFEED	1	<line feed>

### 22.4.2.1. RCSC Processing Requirements

- This interface is primarily for ETC toll amount (TOL\_FARE\_CORR\_ETC\_AMT) corrections. The transaction type (TOL\_TRX\_TYPE\_CORR), fare id (TOL\_FARE\_CORR\_ID), and transaction class (AVC\_CLASS\_ID\_CORR) can also be modified so that the reason for the change to the ETC toll amount can be saved. Corrections are only sent when there is a change in the ETC fare amount.
- The transaction type (TOL\_TRX\_TYPE\_CORR), tag type (TOL\_TAG\_TYPE), fare id (TOL\_FARE\_CORR\_ID), and transaction class (AVC\_CLASS\_ID\_CORR) values are saved for future summarization of transaction data in reports.
- ATCAS II Host sends a maximum of one (1) correction file per day. The correction file is generated and sent after the business day has been closed at the ATCAS II Host.
- Correction transactions in this file have a unique transaction number for each record in the file.



- Correction transactions contain the original transaction number (ORIG\_TRX\_NUMBER) of the transaction being corrected.
- The ATCAS II host waits for a response that the original transaction was posted before sending the request to correct it.
- The ATCAS II host sends the file with a corrected ETC fare amount (TOL\_FARE\_CORR\_ETC\_AMT) of 00000 to reverse the original transaction.
- Violation transactions (TOL\_TRX\_TYPE = 2) can only be reversed by setting the ETC and cash fare amounts (TOL\_FARE\_CORR\_ETC\_AMT and TOL\_FARE\_CORR\_CASH\_AMT) values to 00000. Modifying the transaction type, fare id, and transaction class or setting the fare amounts to something other than 00000 causes the RCSC to reject the transaction correction record with the error, process the remainder of the transaction correction file, and notify the ATCAS II Host of the error via the correction response file. The correction response file has a corresponding error and reason code indicative of the error. See Sections 0 and 0.
- Non-violation transactions (TOL\_TRX\_TYPE not = 2) can not be converted to violation transactions since there are no corresponding images. Changing the transaction type to violation (TOL\_TRX\_TYPE\_CORR = 2) causes the RCSC to reject the transaction correction record with the error, process the remainder of the transaction correction file, and notify the ATCAS II Host of the error via the correction response file. The correction response file has a corresponding error and reason code indicative of the error. See Sections 0 and 0.
- This interface is for BATA/Home customers only. In case any CTOC transactions are included in this file, the RCSC rejects the entire file with an ack file status of 01.
- There is only one (1) adjustment per one (1) posted transaction.
- The RCSC creates 2 new transactions for each correction transaction.
  - a. Transaction #1 – will be posted to customer account as a reversal amount of the original posted amount.
  - b. Transaction #2 – will be the new amount received from ATCAS II in the correction file.
- The RCSC performs sanity checks on the Transaction Correction File to look for formatting errors, record count mismatches between header and detail records, etc. In the event the file fails on these sanity checks, the RCSC notifies the ATCAS II Host of the anomaly by means of the acknowledgment file. See Section 0, the RETURN\_CODE value.
- If the RCSC determines an error in a detail record, the RCSC rejects the transaction record with the error, processes the remainder of the transaction file, and notifies the ATCAS II Host of the error via the ETC response file. The ETC response file has a corresponding error and reason code indicative of the error. See Sections 0 and 0.
- The RCSC always charges the ETC toll amount received from the ATCAS II Host. The toll amount calculated at the ATCAS II Host as supplied in the TOL\_FARE\_CORR\_ETC\_AMT field of the transaction file is used to debit the BATA Regional CSC accounts. This includes toll amount due for non-revenue customers (ATCAS II sends 00000 in the TOL\_FARE\_CORR\_ETC\_AMT field for non-revenue customers).
- The RCSC has the capability of rejecting a transaction based on the age of the transaction. This is a configurable value and is set to 365 days for all incoming transactions from the ATCAS II Host. This value can be changed as requested by BATA.
- The business date (BUSINESS\_DATE) shall be set to the calendar day in which the transaction occurred at the lane. The only exception is when the adjustment that is made at the ATCAS II host



after the business day has been closed at the ATCAS II host. In this case, the business date shall be set to the calendar day in which the adjustment was made and was approved at the ATCAS II host.

### 22.4.3. ETC Response File Received from the RCSC

The ETC response file is generated by the RCSC after the ETC transaction file is processed to give the final disposition of the transactions. This file consists of a header record, followed by a detail record for each transaction disposition in the batch, and then followed by a trailer record. Refer to Chapter 8 Host System Software Section 8.9.1 Business Day Complete and Section 8.9.3 Audit ETC Variances for details on how to reconcile discrepancies in the ETC response file. The record formats for the ETC response file are shown in the following tables.

**Table 22-17: ETC Response File Received from the RCSC (Header Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 7	RECORD_TYPE	7	“#HEADER”
• 2	8	FILLER_1	1	<comma> separator (“,”)
• 3	9 – 12	FILE_TYPE	4	”RES “
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14 – 19	SEQUENCE_NO	6	Unique sequence number for the ETC Transaction File that corresponds to this response (000000 – 999999)
• 6	20	FILLER_3	1	<comma> separator (“,”)
• 7	21 – 30	BUSINESS_DATE	10	Business Date for the ETC Transaction File that corresponds to this response (MM/DD/YYYY)
• 8	31	FILLER_4	1	<comma> separator (“,”)
• 9	32 – 33	SOURCE	2	“RC”
• 10	34	FILLER_5	1	<comma> separator (“,”)
• 11	35 – 36	DESTINATION	2	“AT”
• 12	37	FILLER_6	1	<comma> separator (“,”)
• 13	38 – 47	CREATE_DATE	10	File Creation Date (MM/DD/YYYY)
• 14	48	FILLER_7	1	<comma> separator (“,”)
• 15	49 – 56	CREATE_TIME	8	File Creation Time (HH:MM:SS)
• 16	57	LINEFEED	1	<line feed>

**Table 22-18: ETC Response File Received from the RCSC (Detail Record)**

Field	Position	Name	Length	Description / Contents
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Field	Position	Name	Length	Description / Contents
1	1 – 10	TRANSACTION_NUMBER	10	Unique transaction number to identify the transaction that corresponds to this response (0000000000 – 9999999999)
• 2	11	FILLER_1	1	<comma> separator (“,”)
• 3	12	TOL_TRX_TYPE	1	Type of transaction. “1” = ETC “3” = Carpool “4” = Non-Revenue “5” = Hybrid “6” = HOV2 “7” = HOV3
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14 – 17	TOL_TAG_ID	4	Tag ID in accordance with the Title-21 specs (0000 – 1023)
• 6	18	FILLER_3	1	<comma> separator (“,”)
• 7	19 – 24	TOL_TAG_FACILITY_ID	6	Facility Code assigned to issuing agency in accordance with the Title-21 specs (000000 – 262143)
• 8	25	FILLER_4	1	<comma> separator (“,”)
• 9	26	TOL_TAG_TYPE	1	Four Bit Tag Type read from the ETC transponder in hexadecimal (0 – F): “0” = CTOC transponder Possible future use for switchable transponders: “1” = HOV2 “5” = HOV3
• 10	27	FILLER_5	1	<comma> separator (“,”)
• 11	28 – 37	POSTED_DATE	10	Date the transaction was posted to a patron’s account, posted at an away agency, or was rejected (MM/DD/YYYY)
• 12	38	FILLER_6	1	<comma> separator (“,”)
• 13	39 – 41	TOL_PLAZA_ID	3	Plaza ID where the transaction occurred that is part of the unique key needed to identify the transaction that corresponds to this response “002” = “ANTIOCH” “003” = “RICHMOND” “004” = “BAY BRIDGE” “005” = “SAN MATEO” “006” = “DUMBARTON” “007” = “CARQUINEZ” “008” = “BENICIA”





Field	Position	Name	Length	Description / Contents
• 14	42	FILLER_7	1	<comma> separator (“,”)
• 15	43 – 44	TOL_LANE_ID	2	Lane number where the transaction occurred that is part of the unique key needed to identify the transaction that corresponds to this response (00 – 99)
• 16	45	FILLER_8	1	<comma> separator (“,”)
• 17	46 – 50	TOL_FARE_POSTED_AMT	5	Posted amount in cents (00000 – 99999)
• 18	51	FILLER_9	1	<comma> separator (“,”)
• 19	52 – 53	NON_REVENUE_FLAG	2	Indicates if transaction was posted to a non-revenue account (“00” indicates a revenue account and “01” indicates a non-revenue account)
• 20	54	FILLER_10	1	<comma> separator (“,”)
• 21	55	PAYMENT_TYPE	1	Type of payment posted (“A” indicates the transaction was an ETOL posted to an ETC account based on the tag status at the lane, “V” indicates the transaction was posted as a violation based on a failure to pay at the lane, and “E” indicates that the transaction was not posted due to an error exception at the RCSC)
• 22	56	FILLER_11	1	<comma> separator (“,”)
• 23	57 – 59	CSC_REASON_CODE	3	Reason toll amount was posted to an account or was rejected by the RCSC (see Section 0 RCSC Reason Codes )
• 24	60	FILLER_12	1	<comma> separator (“,”)
• 25	61 – 70	BUSINESS_DATE	10	The business day assigned to the transaction that corresponds to this response and used to identify the revenue date for the original transaction (MM/DD/YYYY)
• 26	71	FILLER_13	1	<comma> separator (“,”)
• 27	72 – 77	CSC_BATCH	6	Sequence number assigned to the ETC Transaction File that contained the transaction that corresponds to this response (000000 – 999999)
• 28	78	FILLER_14	1	<comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 29	79 – 94	CSC_ACCT_NO	16	RCSC account number assigned to the BATA RCSC customer account. (Default for Home accounts 0000000000000000) (For other CTOC agencies the CSC_ACCT_NO will be set as follows: 0000000000000098 – SR 91 0000000000000097 – SANDAG 0000000000000096 – TCA 0000000000000095 – CTV 0000000000000094 – SENTRY)
• 30	95	LINEFEED	1	<line feed>

**Table 22-19: ETC Response File Received from the RCSC (Trailer Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 8	RECORD_TYPE	8	• “#TRAILER”
• 2	9	FILLER_1	1	• <comma> separator (“,”)
• 3	10 – 15	SEQUENCE_NO	6	• Same as Header Record SEQUENCE_NO
• 4	16	FILLER_2	1	• <comma> separator (“,”)
• 5	17 – 26	FILE_DATE	10	• Same as Header Record CREATE_DATE
• 6	27	FILLER_3	1	• <comma> separator (“,”)
• 7	28 – 35	DETAIL_COUNT	8	• Count of all ETC responses contained in the detail records (00000000 – 99999999)
• 8	36	LINEFEED	1	• <line feed>

### 22.4.3.1. RCSC Processing Requirements

- All transactions received at the RCSC, via the ETC Transaction File, are sent back to the ATCAS II Host in the response file.
- All transactions received at the RCSC, via the ETC Transaction File, can be reconciled back at the ATCAS II Host with final status code that is passed in the ETC Response File. The reconciliation takes place at file level. For example, if the RCSC receives 100 transactions in file 123, then the same 100 transactions will be reconciled back to the ATCAS II Host in one file.
- The RCSC produces a response file within 9 hours of receipt of a transaction file and produces response files by 10am each day for the previous day’s files.



- The RCSC performs transaction reconciliation at a detail transaction level (i.e., the response file contains details at the transaction level instead of a reconciliation summary).
- The RCSC reconciles all Away CTOC Agency transactions with Expected Revenue and does not wait for response files from an Away Agency. However, in the event the transactions are rejected by the Away agency due to any reason, the revenue variance between the Expected Revenue and the revenue posted by the Away agency is reflected through RCSC Reports.
- In cases when a transaction cannot be posted at the RCSC, the RCSC indicates the reason the transaction was not posted in the CSC\_REASON\_CODE field. The possible reason codes and descriptions are provided in Section 0
- RCSC Reason Codes
- .
- The RCSC receives a unique integer value (SEQUENCE\_NO) contained in the header record in all incoming transaction files from the ATCAS II Host. This unique identifier is sent back as part of the header record in the response file so that the transaction file can be tied to the corresponding response file.
- The RCSC receives a unique transaction number (TRANSACTION\_NUMBER) in each of the transaction detail records from the ATCAS II Host. This unique identifier is sent back as the transaction number in each response detail record in the response file so that the individual transactions can be tied to the corresponding responses.
- The ATCAS II Host checks for response files at configurable intervals that are transferred to the Host by the RCSC. When a new file is received, ATCAS II loads the file and performs certain validations. In all cases the ATCAS II Host generates an acknowledgement file and transmits this back to the RCSC. The acknowledgment file contains a SUCCESS code (value “00”) if the response file passed validation or a FAILURE code (value “01”) if the recon file failed validation. See Section 0
- Incoming File Validation
- .

### 22.4.4. Violation Response File Received from the RCSC

The violation response file is generated by the RCSC after the ETC transaction file is processed to give the final disposition of the transactions. This file consists of a header record, followed by a detail record for each transaction that was posted to a customer account based on the license plate image (ITOL) or based on a change in the tag status (VTOL) in the batch, and then followed by a trailer record. The record formats are shown in the following tables.

**Table 22-20: Violation Response File Received from the RCSC (Header Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 7	RECORD_TYPE	7	“#HEADER”
• 2	8	FILLER_1	1	<comma> separator (“,”)
• 3	9 – 12	FILE_TYPE	4	”VRES“
• 4	13	FILLER_2	1	<comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 5	14 – 19	SEQUENCE_NO	6	Unique sequence number for the Violation Transaction File that corresponds to this response (000000 – 999999)
• 6	20	FILLER_3	1	<comma> separator (“,”)
• 7	21 – 30	BUSINESS_DATE	10	Business Date passed in the Violation Transaction File that corresponds to this response (MM/DD/YYYY)
• 8	31	FILLER_4	1	<comma> separator (“,”)
• 9	32 – 33	SOURCE	2	“RC”
• 10	34	FILLER_5	1	<comma> separator (“,”)
• 11	35 – 36	DESTINATION	2	“AT”
• 12	37	FILLER_6	1	<comma> separator (“,”)
• 13	38 – 47	CREATE_DATE	10	File Creation Date (MM/DD/YYYY)
• 14	48	FILLER_7	1	<comma> separator (“,”)
• 15	49 – 56	CREATE_TIME	8	File Creation Time (HH:MM:SS)
• 16	57	LINEFEED	1	<line feed>

**Table 22-21: Violation Response File Received from the RCSC (Detail Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 10	TRANSACTION_NUMBER	10	Unique transaction number used to identify the transaction that corresponds to this response (0000000000 – 9999999999)
• 2	11	FILLER_1	1	<comma> separator (“,”)
• 3	12	TOL_TRX_TYPE	1	Type of transaction. “2” = Violation
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14 – 17	TOL_TAG_ID	4	Tag ID in accordance with the Title-21 specs (0000 – 1023)
• 6	18	FILLER_3	1	<comma> separator (“,”)
• 7	19 – 24	TOL_TAG_FACILITY_ID	6	Facility Code assigned to issuing agency in accordance with the Title-21 specs (000000 – 262143)
• 8	25	FILLER_4	1	<comma> separator (“,”)

Field	Position	Name	Length	Description / Contents
• 9	26	TOL_TAG_TYPE	1	Four Bit Tag Type read from the ETC transponder in hexadecimal (0 – F): “0” = CTOC transponder Possible future use for switchable transponders: “1” = HOV2 “5” = HOV3
• 10	27	FILLER_5	1	<comma> separator (“;”)
• 11	28 – 37	POSTED_DATE	10	Date the transaction was posted to a patron’s account, posted at an away agency, or was rejected (MM/DD/YYYY)
• 12	38	FILLER_6	1	<comma> separator (“;”)
• 13	39 – 41	TOL_PLAZA_ID	3	Plaza ID where the transaction occurred that is part of the unique key needed to identify the transaction that corresponds to this response “002” = “ANTIOCH” “003” = “RICHMOND” “004” = “BAY BRIDGE” “005” = “SAN MATEO” “006” = “DUMBARTON” “007” = “CARQUINEZ” “008” = “BENICIA”
• 14	42	FILLER_7	1	<comma> separator (“;”)
• 15	43 – 44	TOL_LANE_ID	2	Lane number where the transaction occurred that is part of the unique key needed to identify the transaction that corresponds to this response (00 – 99)
• 16	45	FILLER_8	1	<comma> separator (“;”)
• 17	46 – 50	TOL_FARE_POSTED_AMT	5	Posted amount in cents (00000 – 99999)
• 18	51	FILLER_9	1	<comma> separator (“;”)
• 19	52 – 53	NON_REVENUE_FLAG	2	Indicates if transaction was posted to a non-revenue account (“00” indicates a revenue account and “01” indicates a non-revenue account) or <blank> if no tag was read
• 20	54	FILLER_10	1	<comma> separator (“;”)

Field	Position	Name	Length	Description / Contents
• 21	55	PAYMENT_TYPE	1	Type of payment posted ( “B” indicates the transaction was a VTOL posted to an ETC account based on a change in the tag status, “I” indicates the transaction was an ITOL posted to an ETC account based on the license plate number extracted from the violation image, “E” indicates that the transaction was not posted due to an error exception at the RCSC, “F” indicate the final disposition of the violation if other than “B”, “I”, or “E”)
• 22	56	FILLER_11	1	<comma> separator (“;”)
• 23	57 – 59	CSC_REASON_CODE	3	Reason toll amount was posted to an account or was rejected by the RCSC (see Section 0 RCSC Reason Codes )
• 24	60	FILLER_12	1	<comma> separator (“;”)
• 25	61 – 70	BUSINESS_DATE	10	The business day assigned to the transaction that corresponds to this response and used to identify the revenue date for the transaction (MM/DD/YYYY)
• 26	71	FILLER_13	1	<comma> separator (“;”)
• 27	72 – 77	CSC_BATCH	6	Sequence number assigned to the Violation Transaction File that contained the transaction that corresponds to this response (000000 – 999999)
• 28	78	FILLER_14	1	<comma> separator (“;”)
• 29	79 – 94	CSC_ACCT_NO	16	RCSC account number assigned to the BATA RCSC customer account. (Default for Home accounts 0000000000000000) (For other CTOC agencies the CSC_ACCT_NO will be set as follows: 0000000000000098 – SR 91 0000000000000097 – SANDAG 0000000000000096 – TCA 0000000000000095 – CTV 0000000000000094 – SENTRY)
• 30	95	LINEFEED	1	<line feed>

**Table 22-22: Violation Response File Received from the RCSC (Trailer Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 8	RECORD_TYPE	8	<ul style="list-style-type: none"> <li>• “#TRAILER”</li> </ul>
• 2	9	FILLER_1	1	<ul style="list-style-type: none"> <li>• &lt;comma&gt; separator (“,”)</li> </ul>
• 3	10 – 15	SEQUENCE_NO	6	<ul style="list-style-type: none"> <li>• Same as Header Record SEQUENCE_NO</li> </ul>
• 4	16	FILLER_2	1	<ul style="list-style-type: none"> <li>• &lt;comma&gt; separator (“,”)</li> </ul>
• 5	17 – 26	FILE_DATE	10	<ul style="list-style-type: none"> <li>• Same as Header Record CREATE_DATE</li> </ul>
• 6	27	FILLER_3	1	<ul style="list-style-type: none"> <li>• &lt;comma&gt; separator (“,”)</li> </ul>
• 7	28 – 35	DETAIL_COUNT	8	<ul style="list-style-type: none"> <li>• Count of all ETC responses contained in the detail records (00000000 – 99999999)</li> </ul>
• 8	36	LINEFEED	1	<ul style="list-style-type: none"> <li>• &lt;line feed&gt;</li> </ul>

#### 22.4.4.1. RCSC Processing Requirements

- The RCSC sends back response codes for all violations indicating the final state of the violation, including ITOL, VTOL, rejected, paid, and dismissed violations, as shown in the Reason Codes in Table 22-32. The acknowledgement file is used as an indication that the violation transaction file was valid and that the transactions made it to the RCSC.
- The RCSC produces violation response files within 9 hours of receipt of a transaction file for rejected transactions and as it becomes aware of new ITOL, VTOL, paid, and dismissed violation transactions to be reported. Violation response files with ITOL, VTOL, paid, and dismissed violation transactions can be sent many days later than the receipt of the corresponding violation transaction files. ITOL and VTOL transactions can no longer be posted after the violation is written off at the RCSC (must be posted within 365 days).
- The RCSC performs transaction reconciliation at a detail transaction level (i.e., the response file contains details at the transaction level instead of a reconciliation summary).
- The RCSC indicates if the transaction was an ITOL, VTOL, or was rejected in the PAYMENT\_TYPE field.
- In cases when a transaction rejected, the RCSC indicates the reason in the CSC\_REASON\_CODE field. The possible reason codes and descriptions are provided in Section 0
- RCSC Reason Codes
- .
- The RCSC receives a unique integer value (SEQUENCE\_NO) contained in the header record in all incoming transaction files from the ATCAS II Host. This unique identifier is sent back as part of the header record in the response file so that the transaction file can be tied to the corresponding response file.
- The RCSC receives a unique transaction number (TRANSACTION\_NUMBER) in each of the transaction detail records from the ATCAS II Host. This unique identifier is sent back as the

transaction number in each response detail record in the response file so that the individual transactions can be tied to the corresponding responses.

- The ATCAS II Host checks for response files at configurable intervals that are transferred to the Host by the RCSC. When a new file is received, ATCAS II loads the file and performs certain validations. In all cases the ATCAS II Host generates an acknowledgement file and transmits this back to the RCSC. The acknowledgment file contains a SUCCESS code (value “00”) if the response file passed validation or a FAILURE code (value “01”) if the reconciliation file failed validation. See Section 0
- Incoming File Validation
- .
- The RCSC tries to match all violation transactions to their corresponding image files and to retry periodically. All transactions which are pending image review and are in a “waiting for image” status for more than 5 days will have to be researched at the ATCAS II Host.

### 22.4.5. Correction Response File Received from the RCSC

The correction response file is generated by the RCSC after the transaction correction file is processed to give the final disposition of the transactions. This file consists of a header record, followed by a detail record for each transaction disposition in the batch, and then followed by a trailer record. The record formats for the correction response file are shown in the following tables.

**Table 22-23: Correction Response File Received from the RCSC (Header Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 7	RECORD_TYPE	7	“#HEADER”
• 2	8	FILLER_1	1	<comma> separator (“,”)
• 3	9 – 12	FILE_TYPE	4	”RTRE“
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14 – 19	SEQUENCE_NO	6	Unique sequence number for the Transaction Correction File that corresponds to this response (000000 – 999999)
• 6	20	FILLER_3	1	<comma> separator (“,”)
• 7	21 – 30	BUSINESS_DATE	10	Business Date for the ETC Transaction File that corresponds to this response (MM/DD/YYYY)
• 8	31	FILLER_4	1	<comma> separator (“,”)
• 9	32 – 33	SOURCE	2	“RC”
• 10	34	FILLER_5	1	<comma> separator (“,”)
• 11	35 – 36	DESTINATION	2	“AT”
• 12	37	FILLER_6	1	<comma> separator (“,”)
• 13	38 – 47	CREATE_DATE	10	File Creation Date (MM/DD/YYYY)



Field	Position	Name	Length	Description / Contents
• 14	48	FILLER_7	1	<comma> separator (“,”)
• 15	49 – 56	CREATE_TIME	8	File Creation Time (HH:MM:SS)
• 16	57	LINEFEED	1	<line feed>

Table 22-24: Correction Response File Received from the RCSC (Detail Record)

Field	Position	Name	Length	Description / Contents
1	1 – 10	TRANSACTION_NUMBER	10	Unique transaction number to identify the transaction that corresponds to this response (0000000000 – 9999999999)
• 2	11	FILLER_1	1	<comma> separator (“,”)
• 3	12	TOL_TRX_TYPE	1	Type of transaction from the TOL_TRX_TYPE_CORR contained the transaction that corresponds to this response “1” = ETC “2” = Violation “3” = Carpool “4” = Non-Revenue “5” = Hybrid “6” = HOV2 “7” = HOV3
• 4	13	FILLER_2	1	<comma> separator (“,”)
• 5	14 – 17	TOL_TAG_ID	4	Tag ID in accordance with the Title-21 specs (0000 – 1023)
• 6	18	FILLER_3	1	<comma> separator (“,”)
• 7	19 – 24	TOL_TAG_FACILITY_ID	6	Facility Code assigned to issuing agency in accordance with the Title-21 specs (000000 – 262143)
• 8	25	FILLER_4	1	<comma> separator (“,”)
• 9	26	TOL_TAG_TYPE	1	Four Bit Tag Type read from the ETC transponder in hexadecimal (0 – F): “0” = CTOC transponder Possible future use for switchable transponders: “1” = HOV2 “5” = HOV3
• 10	27	FILLER_5	1	<comma> separator (“,”)
• 11	28 – 37	POSTED_DATE	10	Date the transaction correction was posted or was rejected (MM/DD/YYYY)
• 12	38	FILLER_6	1	<comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 13	39 – 41	TOL_PLAZA_ID	3	Plaza ID where the transaction occurred that is part of the unique key needed to identify the transaction that corresponds to this response “002” = “ANTIOCH” “003” = “RICHMOND” “004” = “BAY BRIDGE” “005” = “SAN MATEO” “006” = “DUMBARTON” “007” = “CARQUINEZ” “008” = “BENICIA”
• 14	42	FILLER_7	1	<comma> separator (“,”)
• 15	43 – 44	TOL_LANE_ID	2	Lane number where the transaction occurred that is part of the unique key needed to identify the transaction that corresponds to this response (00 – 99)
• 16	45	FILLER_8	1	<comma> separator (“,”)
• 17	46 – 50	TOL_FARE_POSTED_AMT	5	Posted amount from the TOL_FARE_CORR_ETC_AMT contained the transaction that corresponds to this response in cents (00000 – 99999)
• 18	51	FILLER_9	1	<comma> separator (“,”)
• 19	52 – 53	NON_REVENUE_FLAG	2	Indicates if transaction was posted to a non-revenue account (“00” indicates a revenue account and “01” indicates a non-revenue account)
• 20	54	FILLER_10	1	<comma> separator (“,”)
• 21	55	PAYMENT_TYPE	1	Type of payment posted (“A” indicates the transaction was an ETOL posted to an ETC account based on the tag status at the lane, “V” indicates the transaction was posted as a violation based on a failure to pay at the lane, and “E” indicates that the transaction was not posted due to an error exception at the RCSC)
• 22	56	FILLER_11	1	<comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 23	57 – 59	CSC_REASON_CODE	3	Reason toll amount was posted to an account or was rejected by the RCSC (see Section 0 RCSC Reason Codes )
• 24	60	FILLER_12	1	<comma> separator (“,”)
• 25	61 – 70	BUSINESS_DATE	10	The business day assigned to the transaction that corresponds to this response and used to identify the revenue date for the original transaction (MM/DD/YYYY)
• 26	71	FILLER_13	1	<comma> separator (“,”)
• 27	72 – 77	CSC_BATCH	6	Sequence number assigned to the Transaction Correction File that contained the transaction that corresponds to this response (000000 – 999999)
• 28	78	FILLER_14	1	<comma> separator (“,”)
• 29	79 – 94	CSC_ACCT_NO	16	RCSC account number assigned to the BATA RCSC customer account. (Default for Home accounts 0000000000000000) (For other CTOC agencies the CSC_ACCT_NO will be set as follows: 0000000000000098 – SR 91 0000000000000097 – SANDAG 0000000000000096 – TCA 0000000000000095 – CTV 0000000000000094 – SENTRY)
• 30	95	LINEFEED	1	<line feed>

**Table 22-25: Correction Response File Received from the RCSC (Trailer Record)**

Field	Position	Name	Length	Description / Contents
1	1 – 8	RECORD_TYPE	8	“#TRAILER”
• 2	9	FILLER_1	1	<comma> separator (“,”)
• 3	10 – 15	SEQUENCE_NO	6	Same as Header Record SEQUENCE_NO
• 4	16	FILLER_2	1	<comma> separator (“,”)
• 5	17 – 26	FILE_DATE	10	Same as Header Record CREATE DATE
• 6	27	FILLER_3	1	<comma> separator (“,”)



Field	Position	Name	Length	Description / Contents
• 7	28 – 35	DETAIL_COUNT	8	Count of all correction responses contained in the detail records (00000000 – 99999999)
• 8	36	LINEFEED	1	<line feed>

### 22.4.5.1. RCSC Processing Requirements

- All transaction corrections received at the RCSC, via the Transaction Correction File, are sent back to the ATCAS II Host in the response file.
- All transactions received at the RCSC, via the Transaction Correction File, can be reconciled back at the ATCAS II Host with final status code that is passed in the Correction Response File. The reconciliation takes place at file level. For example, if the RCSC receives 100 transactions in file 123, then the same 100 transactions are reconciled back to the ATCAS II Host in one file.
- The RCSC produces a response file within 9 hours of receipt of transaction correction file and produces response files by 10am each day for the previous day’s files.
- The RCSC performs transaction reconciliation at a detail transaction level (i.e., the response file contains details at the transaction level instead of a reconciliation summary).
- In cases when a transaction cannot be posted at the RCSC, the RCSC indicates the reason the transaction was not posted in the CSC\_REASON\_CODE field. The possible reason codes and descriptions are provided in Section 0
- RCSC Reason Codes
- .
- The RCSC receives a unique integer value (SEQUENCE\_NO) contained in the header record in all incoming transaction files from the ATCAS II Host. This unique identifier is sent back as part of the header record in the response file so that the transaction file can be tied to the corresponding response file.
- The RCSC receives a unique transaction number (TRANSACTION\_NUMBER) in each of the transaction detail records from the ATCAS II Host. This unique identifier is sent back as the transaction number in each response detail record in the response file so that the individual transactions can be tied to the corresponding responses.
- The ATCAS II Host checks for response files at configurable intervals that are transferred to the Host by the RCSC. When a new file is received, ATCAS II loads the file and performs certain validations. In all cases the ATCAS II Host generates an acknowledgement file and transmits this back to the RCSC. The acknowledgment file contains a SUCCESS code (value “00”) if the response file passed validation or a FAILURE code (value “01”) if the recon file failed validation. See Section 0
- Incoming File Validation
- .

### 22.4.6. Acknowledgement File Sent to and Received from the RCSC

The acknowledgement file that is sent to the RCSC in response to incoming files and is received from the RCSC in response to outgoing files does not have any header or trailer records. The record format is shown in the following table.

**Table 22-26: Acknowledgement File Sent to and Received from the RCSC**

Field	Position	Name	Length	Description / Contents
1	1 – 4	FILE_TYPE	4	File type (“ACK “)
• 2	5 – 7	FROM_AGENCY_ID	3	Agency that received the file referenced in the ORIG_FILE_NAME_TYPE field and is sending this acknowledgment (“AT2” for ATCAS II and “CSC” for RCSC)
• 3	8 – 10	TO_AGENCY_ID	3	Agency that transmitted the file referenced in the ORIG_FILE_NAME_TYPE field and is receiving this acknowledgment (“AT2” for ATCAS II and “CSC” for RCSC)
• 4	11 – 60	ORIG_FILE_NAME_TYPE	50	File name and type of the file being acknowledged (this is the file name and type before the file was zipped separated by a period)
• 5	61 – 68	FILE_DATE	8	Date the acknowledgment file was created (YYYYMMDD)
• 6	69 – 74	FILE_TIME	6	Time the acknowledgment file was created (HHMMSS)
• 7	75 – 76	RETURN_CODE	2	Code indicating the status of the file being acknowledged (“00” indicates that the file use successfully received and verified and “01” indicates that the file was received but contained invalid data)
• 13	77	LINEFEED	9	<line feed>

#### 22.4.6.1. RCSC Processing Requirements

- This file contains a single record only. For each file received by ATCAS II or RCSC, the ATCAS II or RCSC generates an Acknowledgement File and transmits the file back to the sender. An Acknowledgement File is generated for every file documented in Section **Error! Reference source not found.** with the exception of the Violation Data Files and of other Acknowledgement Files.
- The RCSC saves the acknowledgements for use in researching and resolving problems with the ATCAS II RCSC interface.
- The ACK file indicates that a file was successfully received by the receiving agency. The ACK provides an audit trail for research and can be used as a key event, in the future, in the Regional CSC. The Regional CSC is not designed to recognize the receipt of an ACK file for the continuation of an operation (i.e. CTOC Invoicing).



- All incoming files that fail file-sanity checks (for example, the header record count does not match the trailer record or the record length in file) are rejected with reject code 01.
- Records received in transaction files where the data elements are inconsistent with the field definitions in this document (for example, invalid date, invalid plaza\_id, or invalid lane id) are asked with a code of 00, if the file passed the sanity check, as mentioned. These individual records have reject codes in the response file going back to the sender.

### 22.4.7. Violation Data Files and Images Sent to the RCSC

The violation data file that is sent to the RCSC does not have any header or trailer record. This file contains the license plate number and state and associated image processing information that was performed by the LPR Server. The record format was taken from Section 20 of the VECTOR Regional BATA Interface Control Document Rev. 1.6.8 Final dated April 28, 2006 and is shown in the following table.

**Table 22-27: Violation Data File Sent to the RCSC**

Field	Position	Name	Length	Description / Contents
1	1 – 3	AGENCY_ID	3	Agency where the violation transaction occurred (“CAL”)
2	4 – 7	PLAZA_ID	4	Plaza ID where the violation transaction occurred
• 3	8 – 10	LANE_ID	3	Lane number where the violation transaction occurred
• 4	11 – 18	TRX_DATE	8	Date the violation transaction occurred (YYYYMMDD)
• 5	19 – 26	TRX_TIME	8	Time the violation transaction occurred (HHMMSS TT where TT is 1/100 <sup>th</sup> of a second)
• 6	27 – 34	VEHICLE_SEQUENCE_NUM	8	Unique vehicle sequence number assigned to the violation transaction by the lane/zone controller (00000000 – 99999999)
• 7	35 – 37	OCR_READ_CONFIDENCE	3	Overall license plate recognition confidence from the LPR Server as a percentage
• 8	38 – 47	PLATE_NUMBER	10	License plate number from the LPR Server
• 9	48 – 51	PLATE_STATE	4	License plate state from the LPR Server
• 10	52	NUMBER_OF_IMAGES_TRX	1	Number of violation images associated with the violation transaction from the LPR Server
• 11	53	IMAGE_INDEX_NUMBER	1	Image index number of the image that was used by the LPR Server to determine the license plate number and state
• 12	54 – 63	FILLER	8	<blanks>
• 13	64	LINEFEED	9	<line feed>



### 22.4.7.1. RCSC Processing Requirements

- All images (four color images in JPEG format and one black and white image in BMP format) and the corresponding Violation Data File are zipped into a single file (one per violation).
- The PLAZA\_ID, LANE\_ID, and VEHICLE\_SEQUENCE\_NUM in the Violation Data File can be matched with the violation transaction’s TOL\_PLAZA\_ID, TOL\_LANE\_ID, and LANE\_TX\_SEQUENCE\_NUMBER in the Violation Transaction File to match the images with the correct violation.
- Images are processed based on the overall image confidence level passed in the Violation Data File.
- Violation Data Files are not passed to the RCSC without the corresponding images.

### 22.4.8. Incoming File Validation

For the tag status file, ETC and violation response files, acknowledgement file, and violation data file the data contained in the files is validated. If any part of the file is determined to be invalid then the entire processing of the file will be rolled back. This section describes the steps of validation for incoming files.

**Table 22-28: Tag Status File Validation**

STEP	DETAILS
Examine the filename	Extract the DateTime from the file name. Verify that the DateTime is in the valid format and that it is greater than the Tag Status File DateTime that was previously processed.
Read file header record	Ensure that the RECORD_COUNT is numeric. Ensure that the RECORD_COUNT is not more than 10% greater or more than 2% less than the RECORD_COUNT in the previous tag status file. The percentage values are configurable in the tbApplParam table.
Read file footer record	Ensure that the RECORD_COUNT is numeric and that that it matches the RECORD_COUNT in the header and the number of detail records contained in the file.
Read and examine all detail records in the file	Ensure all the numeric fields contained in each record contain numeric data within the range of values defined in the record description.

**Table 22-29: ETC and Violation Response File Validation**

STEP	DETAILS
Examine the filename	Extract the DateTime from the file name. Verify that the DateTime is in the valid format and that it is greater than either the ETC Response DateTime or the Violation Response DateTime (as appropriate) that was previously processed.
Read file header record	Ensure that the RECORD_TYPE, FILE_TYPE, SOURCE, and DESTINATION fields contain the required values and that



STEP	DETAILS
	<p>CREATE_DATE has a valid date value and that CREATE_TIME has a valid time value</p> <p>Ensure that the SEQUENCE_NO and BUSINESS_DATE match the ETC Response or the Violation Response (as appropriate) previously sent.</p>
<p>Read file footer record</p>	<p>Ensure that the RECORD_TYPE contains the required value.</p> <p>Ensure that the SEQUENCE_NO and FILE_DATE match the SEQUENCE_NO and CREATE_DATE values in the header.</p> <p>Ensure that the RECORD_COUNT is numeric and that that it matches the number of detail records contained in the file.</p>
<p>Read and examine all detail records in the file</p>	<p>Ensure all the numeric fields contained in each record contain numeric data within the range of values defined in the record description.</p> <p>Ensure the POSTING_DATE, NON_REVENUE_FLAG, and PAYMENT_TYPE values match the format and values defined in the record description.</p> <p>Ensure the TRANSACTION_NUMBER, TOL_TRX_TYPE, TOL_TAG_ID, ETC_TAG_FACILITY_ID, TOL_PLAZA_ID, TOL_LANE_ID, BUSINESS_DATE, and CSC_BATCH match a transaction in the corresponding ETC or violation transaction file (as appropriate).</p>

**Table 22-30: Acknowledgement File Validation**

STEP	DETAILS
<p>Examine the filename</p>	<p>Extract the From_Agency, File_Name, and File_Type.</p> <p>Verify From_Agency is “CSC”.</p> <p>Verify File_Name and File_Type match a file previously sent to the RCSC.</p>
<p>Read the file</p>	<p>Ensure that there is only a single record in the file.</p> <p>Ensure the FILE_TYPE is “ACK”, the FROM_AGENCY_ID is “CSC”, the TO_AGENCY_ID is “CAL”, and the ORIG_FILE_NAME_TYPE matches the File_Name and File_Type values contained in the filename (i.e. File_Name.File_Type).</p> <p>Ensure the FILE_DATE, FILE_TIME, and RETURN_CODE values match the format and values defined in the record description.</p>

**Table 22-31: Violation Data File Validation**

STEP	DETAILS
<p>Examine the filename</p>	<p>Extract the AGENCY_ID, PLAZA_ID, LANE_ID, DATE, TIME, and SEQ_NO.</p> <p>Verify AGENCY_ID is “CAL”.</p> <p>Verify that PLAZA_ID, LANE_ID, DATE, TIME, and SEQ_NO correspond to a vehicle transaction in the database.</p>
<p>Read the file</p>	<p>Ensure that there is only a single record in the file.</p> <p>Ensure all the numeric fields contained in each record contain numeric data.</p> <p>Ensure the AGENCY_ID, PLAZA_ID, LANE_ID, TRX_DATE, TRX_TIME, and VEHICLE_SEQUENCE_NUM match the values contained in the filename.</p>





STEP	DETAILS
	Ensure the OCR_READ_CONFIDENCE value is a percentage. Ensure that there are violation image files corresponding to the number of images indicated in NUMBER_OF_IMAGES_TRX. Ensure that IMAGE_INDEX_NUMBER is less than or equal to NUMBER_OF_IMAGES_TRX.

### 22.4.9. RCSC Reason Codes

The following table contains a list of RCSC Reason Codes that are returned by the RCSC.

Table 22-32: RCSC Reason Codes

List of codes applicable to Home Agency transactions		
Reason Code	Status	Description
01	TOLL	Home Agency toll posted successfully as a normal ETC transaction
02	VTOL	Home Agency toll posted successfully as a ETC violation transaction
11	TAGINV	Tag Inventory - Tag is currently in the Vector's Inventory status. This status indicates that Tag is in CSC. Any transactions received on a tag will be a violation transaction and go through the violation processing system)
12	TAGLOST	Tag Lost
13	TAGSTOLEN	Tag Stolen
14	TAGRETURNED	Tag in shipping, Returned Defective, Tag Returned
15	TAGDAMAGED	Tag Damaged
16	INVTAG	Invalid tag
22	DUPL	Duplicate transaction – transaction occurred on the same plaza/lane for a given device at the same date/time.
24	INVACC	Invalid Account
25	INVACCLSP	Invalid Account Closing Pending
26	INVACPEND	Invalid Account Pending
27	INVACRVKF	Invalid Account Revoked Final
28	INVACCLOS	Invalid Account Closed
29	POACHING	Poaching transaction – transaction occurred on same tag and date and time within 5 minutes on the same lane.
31	XLANE	Cross Lane transaction – transaction occurred on same tag and date and time on the same plaza but a different lane.
51	QINVPLAZA	Transaction rejected as invalid due to an invalid plaza
52	QINVDATE	Transaction rejected as invalid due to invalid date
53	QINVAGENCY	Transaction rejected as invalid due to invalid agency code
54	QNONVTRX	Unpostable ETC txn - Invalid tag/account status



<b>CSC Reason Codes for CTOC Agency transactions</b>		
<b>Reason Code</b>	<b>Status</b>	<b>Description</b>
06	POST	Transaction posted successfully to a CTOC Agency account due to a tag read at the lanes.
07	PPST	Transaction posted successfully to a CTOC Agency account as a pay-by-plate transaction.
43	TAGB	Transaction happened on a tag with a bad status
45	RJDP	Transaction rejected as duplicate – CTOC transaction occurred on the same plaza/lane for a given device at the same date/time.
46	OLD1	Transaction rejected – Attempt to post the transaction to a closed account after the specified posting limit – 30 days or 60 days (configurable)
48	RINV	Transaction rejected as invalid due to invalid detail data – i.e. if the tag in the transaction is out of range etc.
<b>CSC Reason Codes for Violation transactions</b>		
<b>Reason Code</b>	<b>Status</b>	<b>Description</b>
102	VIMGREVRJT	Violation transaction rejected after image review
• 109	VDMVRJT	Violation transaction rejected after DMV request
• 112	VDMVPAY	Violation transaction paid at DMV Payment
• 113	VDMVREL	Violation transaction paid at DMV Release
• 114	VPFULL	Violation transaction paid full
• 116	VCOLLECT	Violation transaction sent to collection
• 117	VDISS	Violation transaction dismissed
• 206	ITOLAWAY	Toll posted successfully to a valid away agency account using license plate information
• 209	ITOLHOME	Toll posted successfully to a valid home agency account using license plate information
206	VCORREJ	Violation transaction correction rejected because transaction is not aVTOL or ITOL

<b>Proposed Image Reject Codes (To be Finalized)</b>		
<b>Reason Code</b>	<b>Status</b>	<b>Description</b>
301	IMGBLURR	BLURRY OUT OF FOCUS
302	IMGBRIGHT	IMAGE BRIGHT
303	IMGCORRUPT	IMAGE CORRUPTED
304	IMGDARK	IMAGE DARK
305	IMGEMRVEH	EMERGENCY VEHICLE
306	IMGGLARE	IMAGE GLARE
307	IMGGVDPL	PLATE BELONGS TO GOVERNMENT, DIPLOMATS
308	IMGINTCOV	IMAGE INTENTIONALLY COVERED
309	IMGMISMAT	MISMATCHED
310	IMGNOPLT	VEHICLE WITHOUT PLATE
311	IMGNOTRLPLT	TRAILER WITHOUT FRONT OR BACK TRAILER PLATE

312	IMGOUTFRM	IMAGE OUT OF FRAME
313	IMGPARTPLT	PARTIAL PLATE
314	IMGPLTDF	PLATE OBSTRUCTED OR DEFACED
315	IMGREJCORR	IMAGE REJECTED, CORRUPT
316	IMGREJNOPL	Image Rejected Due to No Plate Available
317	IMGSTINV	STATE UNIDENTIFIED
318	IMGTOHIGH	IMAGE TO HIGH
319	IMGTOLEFT	IMAGE TO LEFT
320	IMGTOLOW	IMAGE TO LOW
321	IMGTORIGHT	IMAGE TO RIGHT
322	PLTCANTDET	PLATE CANT DETERMINE

## 22.5. Business Day Tracking

The RCSC interface process sends ETC and Violation transactions at configurable intervals to the RCSC in batches, waits for an acknowledgment and a response file for each batch, and stores the file transfer information in the tbRCSCSendFile and tbRCSCReceiveFile tables. The RCSC interface uses the tbBusinessDay table to track the status of the RCSC interface process in relation to the business day.

Each batch of transactions sent to the RCSC is sent for a specific business day (see Section **Error! Reference source not found. Error! Reference source not found.**). As files are sent and as acknowledgement and response files are received, the RCSC interface updates the tbBusinessDay table for the business day and plaza for which transactions are being sent.

Each time the RCSC interface runs, it first builds the transactions to be sent to the RCSC in the tbRCSCSendTrans and tbRCSCSendCorrections tables and then groups them into batches based on business day to be linked using the iSendFileID field to the records that are inserted into the tbRCSCSendFile table. A file is then created for each record that was inserted into the tbRCSCSendFile table and is sent to the RCSC.

As acknowledgment files are received from the RCSC, a record is inserted in the tbRCSCReceiveFile table and the corresponding tbRCSCSendFile record is updated with the acknowledgment data. As response files are received from the RCSC, a record is inserted in the tbRCSCReceiveFile table. The iSendFileId in the tbRCSCReceiveFile record ties it to the corresponding tbRCSCSendFile record.

The following fields in the tbBusinessDay table are used to track the RCSC interface process in relation to the business day.

- tiVioSentStatus – indicates the current status of the violation transfer to the RCSC for a given plaza and business day (0 = not started, 1 = started, 2 = completed for entire business day, 3 = errors encountered)
- tiETCSentStatus – indicates the current status of the ETC transaction transfer to the RCSC for a given plaza and business day (0 = not started, 1 = started, 2 = completed for entire business day, 3 = errors encountered)
- tiETCPostedStatus – indicates the current status of the ETC transaction transfer to the RCSC for a given plaza and business day (0 = not started, 1 = response file received, 2 = response file received for entire business day, 3 = errors encountered, 4 = response file received for entire business day and not all transactions were posted)
- dtETCPosted – indicates the date and time that the iETCPostedStatus was set to either 2 or 4 (response file received for entire business day)

At the end of the RCSC interface process the data inserted during the process is checked and the tbBusinessDay table is updated accordingly. The following table shows which conditions cause the RCSC interface to set the indicated values.

**Table 22-33: tbBusinessDay RCSC Interface Field Values**

Field Value	Conditions That Cause Field to be Set
tiVioSentStatus = 1	Some of the violations for the business day and plaza have been sent and acknowledged.
tiVioSentStatus = 2	All of the violations for the business day and plaza have been sent and acknowledged.
tiVioSentStatus = 3	An error status was received in at least one of the violation transaction file acknowledgments.
tiETCSentStatus = 1	Some of the ETC transactions for the business day and plaza have been sent and acknowledged.
tiETCSentStatus = 2	All of the ETC transactions for the business day and plaza have been sent and acknowledged.
tiETCSentStatus = 3	An error status was received in at least one of the ETC transaction file acknowledgments.
tiETCPostedStatus = 1	Some of the ETC transactions for the business day and plaza have been sent and a response has been received.
tiETCPostedStatus = 2	All of the ETC transactions for the business day and plaza have been sent and a response has been received and all of the transactions were successfully posted to accounts.
tiETCPostedStatus = 3	A valid ETC response file has not been received and the required time limit for receiving the ETC response file has passed.
tiETCPostedStatus = 4	All of the ETC transactions for the business day and plaza have been sent and a response has been received but not all of the transactions were successfully posted to accounts.
dtETCPosted = getdate()	All of the ETC transactions for the business day and plaza have been sent and a response has been received.

## 22.6. Error Processing

The RCSC interface process may fail if it detects an error due to FTP Server unavailability or transmission data protocol error, or by exceeding the number of transmission retry attempts. In this case the RCSC interface process uses the event code 20010 (External Interface Failure – Generic) and it stores a record in the tbEquipFailure table.

For the tag status file, transaction response file, acknowledgement file, and violation data file the data contained in the files is also validated. When invalid data is found in the tag status, transaction reconciliation, and acknowledgement files, event code 20011 (External Interface Failure – RCSC Invalid File) is generated. When invalid data is found in the violation data file, event code 20018 (External Interface Failure – VES Invalid File) is generated.

If a tag status file or a transaction response file is not received within a configurable amount of time following the previous time the file was received, event code 20012 (External Interface Failure – RCSC Missing File) is

generated and if an acknowledgement file is not received within a configurable amount of time following the transfer of a file to the RCSC, event code 20013 (External Interface Failure – RCSC Missing ACK) is generated. If violation images are not available within a configurable amount of time following the receiving of a violation transaction, event code 20017 (External Interface Failure – VES Missing Images) is generated.

The MMS Alarm Loader software processes the event code and generates work order and notifies the assigned staff on call to resolve the problem.

The detailed trace is stored in the process log file and it is available to the system administrator and the database administrator for further analysis.

The MMS application reports the record failure via the Alarm History report.

All files sent and received are saved in the archive subfolder. They will serve both as an audit of the process, and a source for re-transmittal in the case of an error on either the RCSC or the ATCAS II side. If the file is not successfully transferred or processed, the process via the MMS interface notifies the maintenance staff. Once the problem area is determined and resolved, the file will be re-transmitted to the Outgoing directory and normal processing will resume. An independent cleanup process will be scheduled to clean up files from the archive subfolder that are older than two (2) months (configurable).

# 23.Blackstone (Cash Payment Network) Interface

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## 23.1. Purpose

This document defines the Interface between VECTOR and Blackstone to perform the FasTrak activities which includes Replenishment, Toll Payment and Invoice/Violation payment initiated by a Customer. VECTOR is supported by the ACS, Transportation Solutions Group (TSG).

### 23.1.1. WSDL

Web Service Definition Language (WSDL) will be published and shared by the VECTOR team with Blackstone.

### 23.1.2. Security

The interface will be implemented as a secured web service (SSL). An internal authentication (username/password) will be implemented as an encrypted security setup between Blackstone and the VECTOR Web interface. This will be exchanged at the start of each transaction.

### 23.1.3.Kiosk Validations

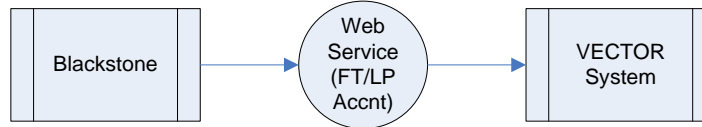
The kiosk will validate for all mandatory/required fields on the screen before sending the request to VECTOR. All functional validation will be performed by VECTOR..

### 23.1.4. Assumptions

1. All transactions coming through Blackstone will be considered cash transactions.
2. All the requests will carry a unique reference number from Blackstone.
3. All the responses will carry a unique reference number from VECTOR.
4. All the payments will carry the VECTOR reference number provided during validation.
5. All payments posted by Blackstone after validation will be considered successful (regardless if a time out, etc. occurs) and will be handled by VECTOR to post it to an account.

## 23.2.Account Replenishment

This service will be used by the “Add Funds to your FasTrak Account” and “Add Funds to Your License Plate Account” options on the Blackstone kiosk.



### 23.2.1.Method: validate

This web service/method hosted by VECTOR will provide the account balance after validating the provided account/toll tag number and ZIP code.

#### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	The Date and time the request is initiated	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – ACCOUNT	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone Reference number for the payment transaction	R
receiveAccountNumber	String (25chars)	Account Number/Toll Tag Number	R
zipcode	String	Account ZIP code	R

#### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R
Response Message	String (100 chars)	Ref. VECTOR Response Code	R
vectorReferenceNumber	String	Vector Unique Reference Number	R
minimumPayment	String	Minimum Payment	R
Balance	Double (+/- 99999.99)	Current Account balance	R

Field	Type/Length	Definition	Required
First Name	String (40 chars)	First Name of the Customer	O
Middle Name	String (1 char)	Middle Name of the Customer	O
Last Name	String (40 chars)	Last Name of the Customer	O
AddressLine1	String (40 chars)	Address Line1	O
AddressLine2	String (40 chars)	Address Line2	O
City	String (25 chars)	City	O
State	String (2 chars)	State	O
Country	String (3 chars)	Country	O
ZIP	String (9 chars)	ZIP code and ZIP Plus	O

The Optional Response fields will be populated only when the Valid type is SUCCESS.

#### Handling Exceptions and Timeouts

In the event of a timeout or any exception during the validation, Blackstone should perform a new validation request.

### 23.2.2. Method: paymentTransfer

This is the web service/method hosted by VECTOR to post the payment. If Blackstone has connectivity with VECTOR, and a response is received from VECTOR, retries will not be necessary. The customer will get a confirmation receipt with the original purchase I.D.

#### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	The Date and time the request is initiated	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – ACCOUNT	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone reference number for the payment transaction	R
validationReferenceNumber	String	Vector reference number returned during validation	R
receiveAccountNumber	String (25chars)	Account Number/Toll Tag Number	R
receiveAmount	Double	Payment Amount	R



Field	Type/Length	Definition	Required
	(+/- 99999.99)		
senderFirstName	String (40 chars)	First Name of the Customer	O
senderMiddleName	String (1 char)	Middle Name of the Customer	O
senderLastName	String (40 chars)	Last Name of the Customer	O
senderAddress1	String (40 chars)	Address Line1	O
senderAddress2	String (40 chars)	Address Line2	O
senderCity	String (25 chars)	City	O
senderState	String (2 chars)	State	O
senderZip	String (9 chars)	ZIP code and ZIP Plus	O

### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R
Response Message	String (100 chars)	Ref. Appendix: VECTOR Response Code	R
vectorReferenceNumber	String	Vector Unique Reference Number	R
processedDateTime	datetime	Vector processed date time	R
requestDateTime	dateTime	Vector Received date time	R
agentId	String	Received Blackstone terminal Id	O
receiveAmount	Double (+/- 99999.99)	Payment Amount	O

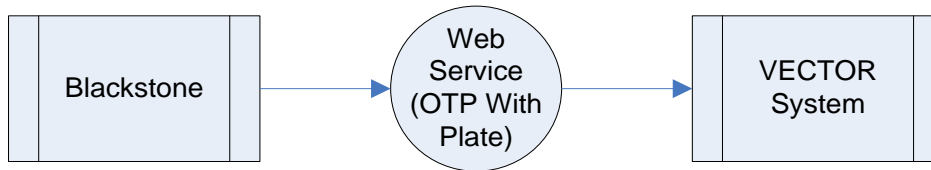
The Optional Response fields will be populated only when the Valid type is SUCCESS.

### Handling Exceptions and Timeouts

In the event of a timeout (as Blackstone waits for a response from VECTOR for one minute) or any exception (e.g., connectivity cannot be established with VECTOR) during the payment posting, Blackstone should perform a retry from the Blackstone host, using the original purchase I.D number (validation request reference number/VECTOR reference number) until it receives a success from VECTOR. The customer will receive a receipt with the original purchase I.D. If the request is received in VECTOR, a successful response will always be provided to Blackstone, and the VECTOR system will handle it internally to post the payment to the account. In the event of a failure, a service request will be created to identify the issue in order for it to be resolved.

## 23.3. One-Time Toll Payment (with License Plate)

This service will be used when the “Make a One-Time Toll Payment for Golden Gate Bridge” (with plate - default) option is selected on the Blackstone kiosk.



### 23.3.1. Method: validate (Toll Due)

This web service/method hosted by VECTOR will validate the incoming license plate and toll details, and compute the toll due amount.

#### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	<a href="#">BATA Regional ICD v1 6.13.7.docx</a>	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – OTP1	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone Reference number for the payment transaction	R
licensePlate	String	Plate Number	R
licenseState	String	Plate State	R
vehicleAxle	String	Axles	R
tollCount	String	Number of tolls	R
travelDate	String	Date of first toll (MM/DD/YY)	R

#### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R

Field	Type/Length	Definition	Required
Response Message	String (100 chars)	Ref. Appendix: VECTOR Response Code	R
vectorReferenceNumber	String	Vector Unique Reference Number	R
Balance	Double (+/- 99999.99)	Amount to be charged	O

The Optional Response fields will be populated only when the Valid type is SUCCESS.

### Handling Exceptions and Timeouts

In the event of a timeout or any exception during the validation, Blackstone should perform a new validation request.

## 23.3.2. Method: paymentTransfer

This web service/method hosted by VECTOR will post the payment. If Blackstone has connectivity with VECTOR, and a response is received from VECTOR, retries will not be necessary. The customer will get a confirmation receipt with the original purchase I.D.

### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	The Date and time the request is initiated	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – OTP1	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone Reference number for the payment transaction	R
validationReferenceNumber	String	Vector reference number returned during validation	R
receiveAmount	Double (+/- 99999.99)	Payment Amount	R
licensePlate	String	Plate Number	R
licenseState	String	Plate State	R
vehicleAxle	String	Axles	R
tripCount	String	Number of tolls	R
travelDate	String	Date of first toll (MM/DD/YY)	R

### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R
Response Message	String (100 chars)	Ref. Appendix: VECTOR Response Code	R
vectorReferenceNumber	String	Vector Unique Reference Number	R
processedDateTime	Datetime	Vector processed date time	R
requestDateTime	dateTime	Vector received date time	R
agentId	String	Received Blackstone terminal Id	O
receiveAmount	Double (+/- 99999.99)	Payment Amount Received	O

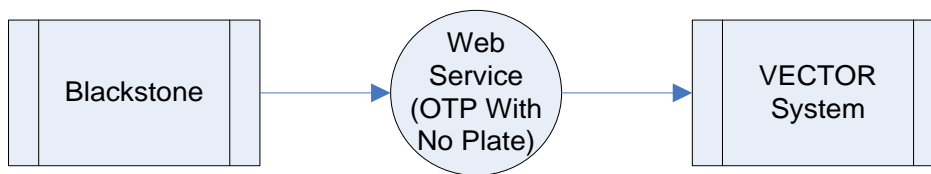
**The Optional Response fields will be populated only when the Valid type is SUCCESS.**

### Handling Exceptions and Timeouts

In the event of a timeout (as Blackstone waits for a response from VECTOR for one minute) Blackstone should perform a retry from the Blackstone host using the original Purchase I.D. (validation request reference number/VECTOR reference number) until a success is received from VECTOR. For any other exception (e.g. connectivity cannot be established with VECTOR) during the payment posting, Blackstone will not retry. [A failure message will be sent to the cashier for cases where the plate effective date entered by the customer already exists on another account \(for the same plate\).](#) The customer will receive a receipt with the original purchase I.D. If the request is received in VECTOR, a successful response will always be provided to Blackstone and the VECTOR system will handle it internally to post the payment to the account. In the event of a failure, a service request will be created to identify the issue, in order for it to be resolved.

## 23.4. One-Time Toll Payment (No Plate)

This service will be used when the “Make a One-Time Toll Payment for Golden Gate Bridge” (with no plate – “My vehicle does not have a license plate yet.”) option is selected on the Blackstone kiosk.



### 23.4.1. Method: validate (Toll Due)

This web service/method hosted by VECTOR will validate the incoming vehicle details and compute the toll amount due.

#### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	The Date and time the request is initiated	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – OTP2	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone reference number for the payment transaction	R
vehicleMake	String	Vehicle Make	R
vehicleModel	String	Vehicle Model	R
vehicleAxle	String	Axle	R
tripCount	String	Number of tolls	R

#### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R
Response Message	String (100 chars)	Ref. Appendix: VECTOR Response Code	R
vectorReferenceNumber	String	Vector Unique Reference Number	R
Balance	Double (+/- 99999.99)	Amount to be charged	O

The Optional Response fields will be populated only when the Valid type is SUCCESS.

#### Handling Exceptions and Timeouts

In the event of a timeout or any exception during the validation, Blackstone will perform a new validation request.

### 23.4.2. Method: paymentTransfer

This web service/method hosted by VECTOR will post the payment. If Blackstone has connectivity with VECTOR, and a response is received from VECTOR, re-tries will not be necessary. The customer will get a confirmation receipt with the original purchase I.D.

### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	The Date and time the request is initiated	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – OTP2	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone reference number for the payment transaction	R
validationReferenceNumber	String	Vector reference number returned during validation	R
receiveAmount	Double (+/- 99999.99)	Payment Amount	R
vehicleMake	String	Vehicle Make	R
vehicleModel	String	Vehicle Model	R
vehicleAxle	String	Axle	R
tripCount	String	Number of tolls	R

### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R
Response Message	String (100 chars)	Ref. Appendix: VECTOR Response Code	R
vectorReferenceNumber	String	Vector Unique Reference Number	R
processedDateTime	datetime	Vector processed date time	R
requestDateTime	dateTime	Vector Received date time	R

Field	Type/Length	Definition	Required
agentId	String	Received Blackstone terminal Id	O
receiveAmount	Double (+/- 99999.99)	Payment Amount Received	O

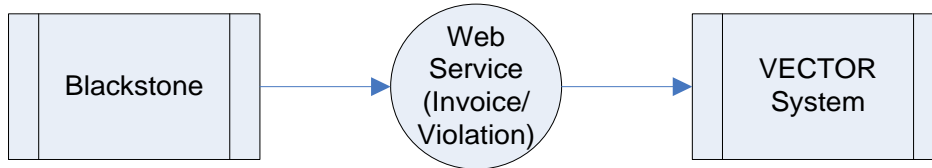
The Optional Response fields will be populated only when the Valid type is SUCCESS.

### Handling Exceptions and Timeouts

In the event of a timeout (as Blackstone waits for a response from VECTOR for one minute) or any exception (e.g., connectivity cannot be established with VECTOR) during the payment posting, Blackstone should perform a retry from the Blackstone host, using the original Purchase I.D. (validation request reference number/VECTOR reference number) until they receive a success from VECTOR. If the request is received in VECTOR, a successful response will always be provided to Blackstone, and the VECTOR system will handle it internally to post the payment to the account. The customer will receive a receipt with the original purchase I.D. In the event of a failure, a service request will be created to identify the issue, in order for it to be resolved.

## 23.5. Pay Invoice/Violation

This service will be used when the “Pay a Golden Gate Bridge Toll Invoice” and “Pay a Violation Notice” options are selected the Blackstone kiosk.



### 23.5.1. Method: validate

#### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	The Date and time the request is initiated	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – INVOICE/VIOLATION	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone reference number for the payment transaction	R
licensePlate	String	License Plate Number	R
receiveAccountNumber	String (25chars)	Document Number	R

#### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R
Response Message	String (100 chars)	Ref. Appendix: VECTOR Response Code	R



Field	Type/Length	Definition	Required
vectorReferenceNumber	String	Vector Unique Reference Number	R
Balance	Double (+/- 99999.99)	Amount to be charged	R

The Optional Response fields will be populated only when the Valid type is SUCCESS.

### Handling Exceptions and Timeouts

In the event of a timeout or any exception during the validation Blackstone will perform a new validation request.

## 23.5.2. Method: paymentTransfer

This web service/method hosted by VECTOR will post the payment for the document (Invoice/Violation). If Blackstone has connectivity with VECTOR, and a response is received from VECTOR, re-tries will not be necessary. The customer will get a confirmation receipt with the original purchase I.D.

### Request/Input Field Description

Field	Type/Length	Definition	Required
processDateTime	dateTime	The Date and time the request is initiated	R
agentId	String (10Chars)	Terminal Id	R
Type	String	Transaction type – INVOICE/VIOLATION	R
bsLocationName	String (50 chars)	Blackstone location name	R
bsZipcode	String (5)	Blackstone location ZIP code	R
bsReferenceNumber	String	Blackstone reference number	R
validationReferenceNumber	String	Vector reference number returned during validation	R
receiveAmount	Double (+/- 99999.99)	Payment Amount	R
receiveAccountNumber	String (25chars)	Document Number	R

### Response/Output Field Description

Field	Type/Length	Definition	Required
Valid	String	SUCCESS/FAIL	R
Response Code	String (4chars)	Ref. Appendix: VECTOR Response Code	R
Response Message	String (100 chars)	Ref. Appendix: VECTOR Response Code	R
vectorReferenceNumber	String	Vector Unique Reference Number	R
processedDateTime	datetime	Vector processed date time	R
requestDateTime	dateTime	Vector received date time	R
agentId	String	Received Blackstone terminal Id	O
receiveAmount	Double (+/- 99999.99)	Payment Amount	O

The Optional Response fields will be populated only when the Valid type is SUCCESS.

### Handling Exceptions and Timeouts

In the event of a timeout (as Blackstone waits for a response from VECTOR for one minute) or any exception (e.g., connectivity cannot be established with VECTOR) during the payment posting, Blackstone should perform a retry from the Blackstone host, using the Purchase I.D. (original validation request reference number/VECTOR reference number) until they receive a success from VECTOR. The customer will receive a receipt with the original purchase I.D. If the request is received in VECTOR, a successful response will be provided to Blackstone, and the VECTOR system will handle it internally to post the payment to the account. In the event of a failure a service request will be created to identify the issue, in order to be resolved.

## 23.6.Vector Response Code

Response Code	Response Message	Description
0000	Success	SUCCESS
0101	Record not found	Generic error message if the account number, toll tag number or document number is not found in Vector.
0102	System unavailable	Generic error message for any system related issues.
0110	Authentication Failed	Generic error message for Account Number/ZIP code, Toll Tag Number/ZIP code or Document Number/License Plate Number validation.

Response Code	Response Message	Description
0139	Account does not allow this operation	The account status for the account selected (OTP, invoice or violation) does not allow for the operation requested (ex., replenishment not allowed for an account with an invalid status, either RVKF or Closed).
0219	Account financial status not valid	Generic error message if a payment is made on a closed/ RVKF FT or LP account.
0220	Invalid transaction	This is a generic error message for payment processing errors (ex. Vector connectivity issue).
0221	Maximum payment amount exceeded	If the limit is exceeded for the maximum amount that can be paid. The Blackstone max payment limit is \$500. Invoice and violation payments will be limited to the balance due.
0222	Insufficient payment amount	Error message when the amount paid is less than the required minimum amount.
0225	Invalid citation status	The invoice/violation is not in an open or part paid status.
0226	Invalid Travel Date	Travel date validation
0227	Invalid Axle	Vector validation message however, the number of axles will be validated at the kiosk.
0228	Duplicate Plate	This response message will be sent if the license plate entered exists on another account with the same effective date.
0229	Invalid Plate State	Plate state validation
0999	Unknown reason for failure	This is a generic error message for system level errors.

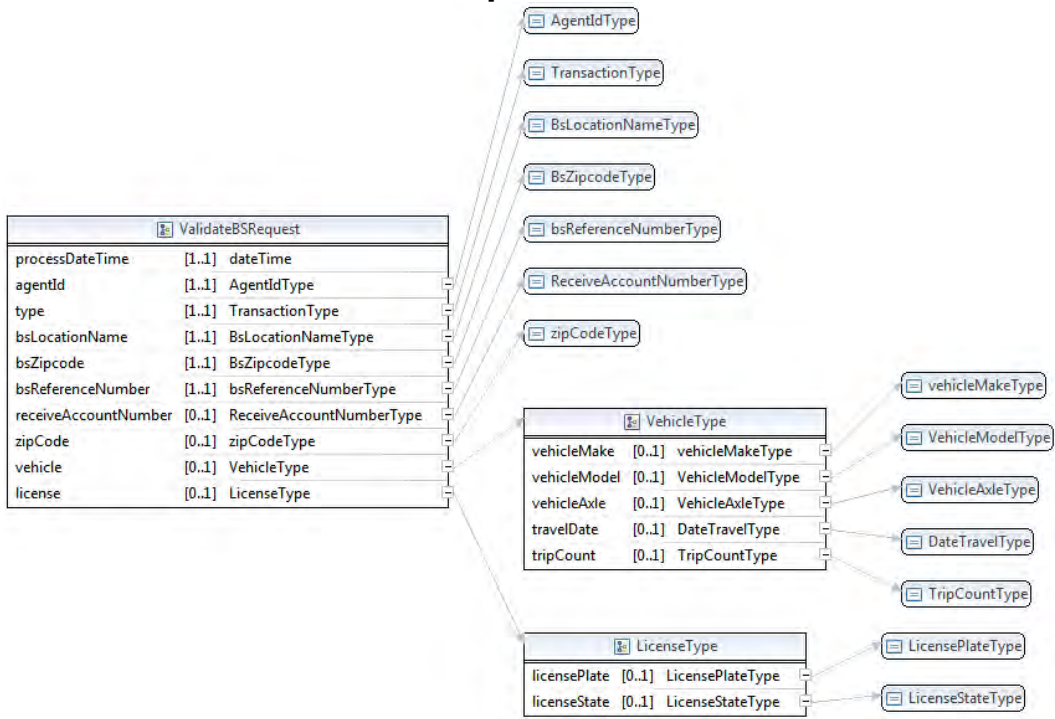
## 23.7. WSDL File



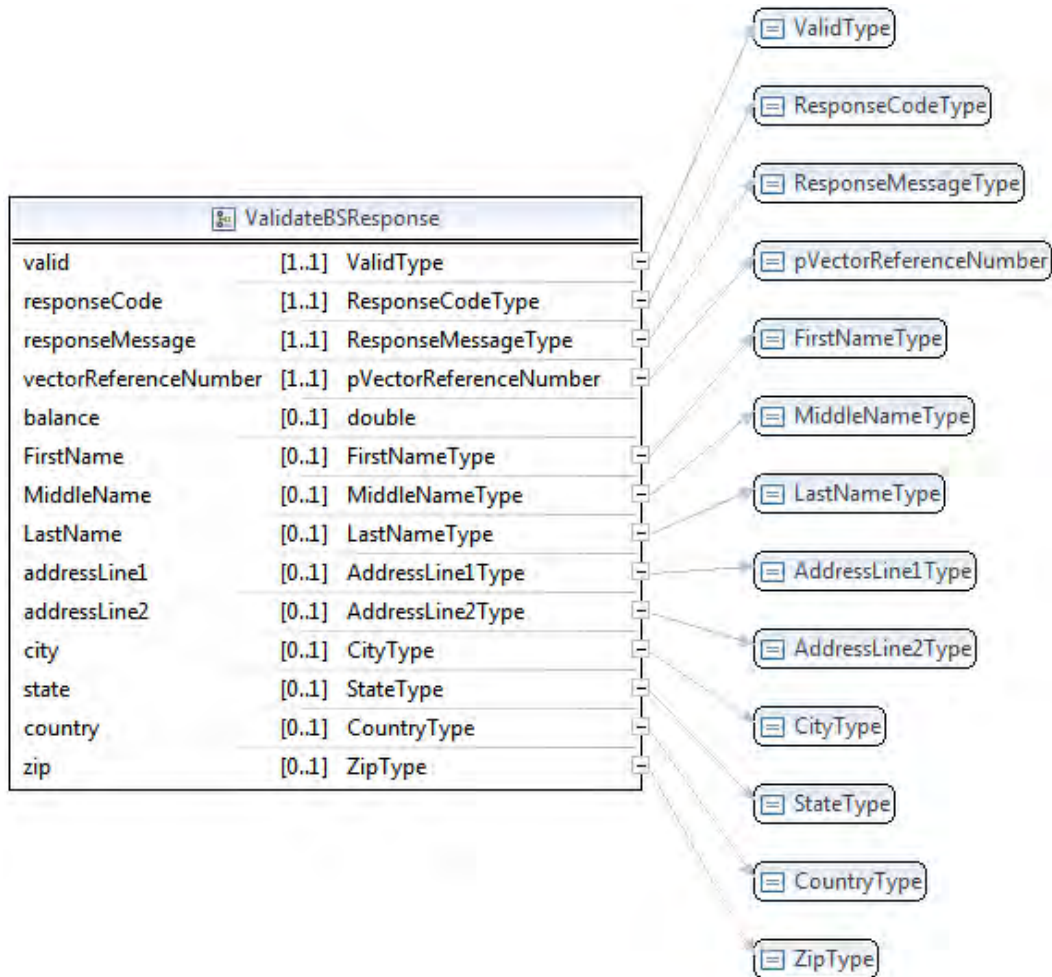
VectorWSBata.wsdl

## 23.8. Data Structure

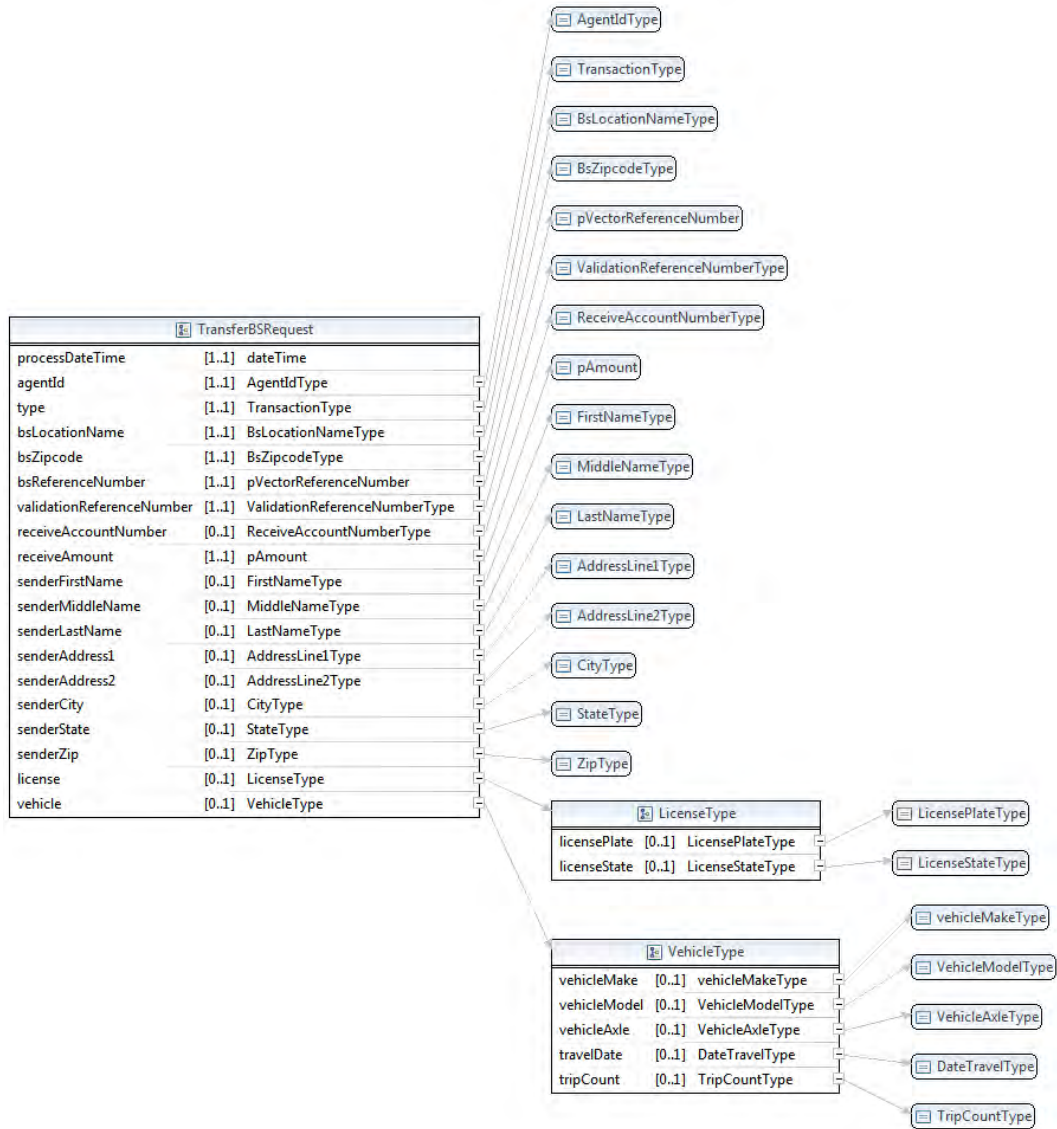
### 23.8.1. Validate Request



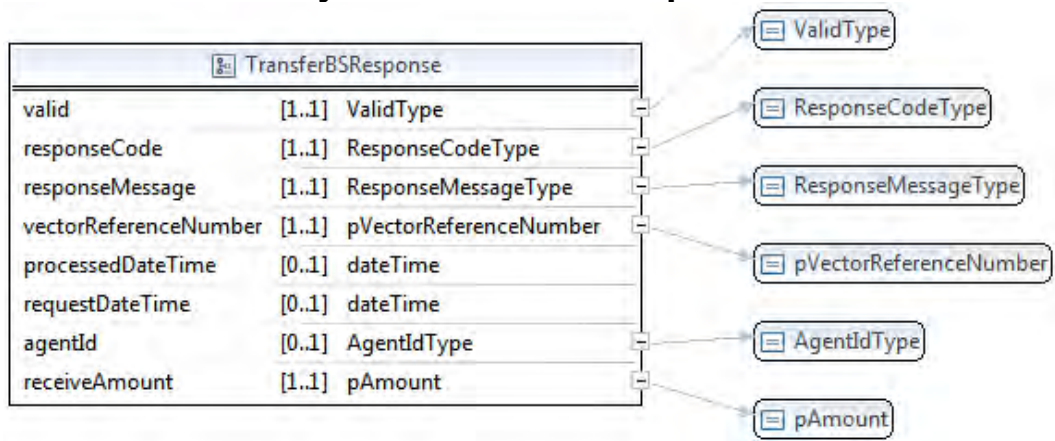
### 23.8.2. Validate Response



### 23.8.3. Payment Transfer Request



### 23.8.4. Payment Transfer Response



# 24.Collections Interface

---

## 24.1.Overview

This document describes in detail the file types, file layouts and file descriptions about the collection file exchange between BATA (Xerox) and the Collection agency.

## 24.2.File Generation Frequency

1. Xerox will generate a new file in every X number of days.
2. Xerox will generate an update file in every X number of days.

## 24.3.Term Definitions

<b>LPAD</b>	Field is left-padded with spaces or zeros as indicated in the description column.
<b>RPAD</b>	Field is right-padded with spaces or zeros as indicated in the description column.
<b>CHAR</b>	A single character field.
<b>STRING</b>	A field that will support alphanumeric and special characters supported under Unicode.
<b>DATE</b>	A sequence of digits representing the date (and in some cases the time also).
<b>NUMBER</b>	A sequence of digits only.
<b>SIGNED NUMBER</b>	A sequence of digits only preceded by the + / - sign.
<b>1,6,2</b>	This format represents a signed field in which the leftmost position is the sign indicator. The next 6 digits indicate the integral part of a floating-point number. The last 2 digits indicate 2 positions to the right of the decimal. The decimal is not displayed on the field.

## 24.4.New File Specifications: From ACS - Collections

### 24.4.1. Description

The file contains the information for the accounts where the citation\_level is in (COLL3) and citation\_status is in (PAIDPART or OPEN). There are 4 types of records.



## 24.4.2. File Name

AA2CO2\_YYYYMMDDHHMMSS.NEW

Where: AA is Agency ID and YYYYMMDDHHMMSS is file creation date and time.

## 24.4.3. File Layout

### 24.4.3.1. File Header Record

Field	Length	Format	Description
Recordtype	1	Char	Always 'H'
DateTime	14	Char	eg. 20040304000000

### 24.4.3.2. Demographic Information: File Detail Record

Field	Length	Format	Description
Recordtype	1	Char	Always 'N'
AccountNo	16	Char	BATA Fastrak account number
FirstName	40	Char	First Name
LastName	40	Char	Last Name
CompanyName	50	Char	Company Name - For Account_type COML or Business
Street_1	40	Char	Address Line1
Street_2	40	Char	Address Line1
City	30	Char	City
Zipcode	6	Char	Zip Code
State	2	Char	State
Filler	1	Char	Ignore this character
Account_type	2	Char	01 PRIVATE 02 COMMERCIAL 03 BUSINESS 08 PVIOLATOR 09 NONREVENUE 10 CVIOLATOR

### 24.4.3.3. Transaction Information: File Detail Record

Field	Length	Format	Description
Recordtype	1	Char	Always 'D'
CitationNumber	13	Char	Notice Number begins with 'T'
Citation Detail Seq	5	Char	Violation sequence Number  Position 1 – hyphen (“-“)

Field	Length	Format	Description
			Position 2 to 4 – Sequence Number. Left Pad with Zeros.  <b>Example:</b> -0002
AccountNo	16	Char	BATA Fastrak account number
CitationDate	8	Char	First notice issuance date
TxDate	8	Char	Violation Occurrence Date
TxTime	6	Char	Violation Occurrence Time
AgencyId	2	Char	Agency where the violation occurred
PlazaId	3	Char	Plaza where the violation occurred
LaneId	5	Char	Lane where the violation occurred
TollDue	4+2	Numeric	Toll Balance on the violation.
FeeDue	4+2	Numeric	Fee balance on the Violation.
NSFDue	4+2	Numeric	Bounced Check Fee balance on the violation.
TotalDue	4+2	Numeric	Total Balance.
PlateNumber	10	Char	License plate number
PlateState	2	Char	License plate State
NDTEV	8	Char	Second notice issuance date (Notice of delinquent toll evasion)
VIOLATIONNIXIE INDICATOR	1	CHAR	1 – NIXIE Violation status 0 – Regular

Below is the sample file for the above new update



CL2CO2\_201207091  
80923.NEW

#### 24.4.3.4. File Trailer Record

Field	Length	Data Type	Description
Transaction Type	1	CHAR	Value = E
Total no. of transactions	9	NUMBER	LPAD zeros
Total dollar amount	12	SIGNED NUMBER	First field is sign indicator (-), then LPAD zeros for remaining 9 NUMERIC fields. E.g., a negative balance of \$150,000.25 is represented as -00015000025

## 24.5.Acknowledgement File – From Collection Agency to Xerox

### 24.5.1. Description

The collection agency will acknowledge the receipt of the SEND files through acknowledgement files. The intent is to confirm proper transmission of the SEND file and the ability to open, read and process the records in it.

### 24.5.2. File Name

*{DAT file name w/o .DAT extension being acknowledged}.ACK*

### 24.5.3. File Layout

1. The record in the acknowledgement file will be a single line.
2. All fields in the trailer record are mandatory.
3. The fields are length delimited and the length of the fields is indicated in the table below.
4. All fields that do not fill the entire field will be padded with zeros or spaces as indicated under the *Description* column.

Field #	Field Name	Length	Data Type	Format	Description
1	Original File Name being Acknowledged	35	STRING	See Section <a href="#">1.2.2</a> & <a href="#">1.3.2</a>	
2	Original File Sequence Number	8	NUMBER		
3	File Processing Status	2	NUMBER		00 = Success, 01 = Failure to read.
4	Acknowledgement File Creation Timestamp	14	DATE		YYYYMMDDHHMNSS in 24-hour format
5	Total no. of transactions from SEND file	9	NUMBER		LPAD zeros
6	Total dollar amount from SEND file	12	SIGNED NUMBER	1,9,2	First field is sign indicator (-), then LPAD zeros for remaining 9 NUMERIC fields. E.g., a negative balance of \$150,000.25 is represented as -00015000025

## 24.6.Negative Account Balance Collection File Interface Control Document

### 24.6.1.Collection Send File – New Accounts

#### 24.6.1.1.Description

1. After an account has gone to RVKF (Revoked Final) status, the customer is given an additional 15 days (actual no. of days is parameter driven) to respond, failing which the account is sent for collections. The following sections describe the file name and structure for the header, detailed and trailer records of the file that will be sent to the collection agency.
2. If applicable, a separate file will be created for each agency. Therefore, a single run of the **Collection Send** batch job could potentially create the specific number of NEW files.

#### 24.6.1.2.File Name

1. *{AGENCY SHORT NAME, max 4 chars}\_COLLNEW\_{8-digit sequence no.}\_MMDDYYYY.DAT*
2. *AGENCY SHORT NAME* –
3. *8-digit sequence no.* – This will be a unique no. which will determine the chronological order in which files should be processed by the recipient. This will be unique across all files (both NEW and UPD files) sent for collection.
4. *MMDDYYYY* – 2-digit month (MM), 2-digit day (DD), 4-digit year (YYYY) of the date the file was created. E.g., File name created on May 15,  
<AGENCYNAME>\_COLLNEW\_00000001\_05152003.DAT

#### 24.6.1.3.File Layout

##### 24.6.1.3.1.Header Record

1. The header record will be a single line and will appear as the first line in the file.
2. The header record will start with an H as indicated in the field details below. All fields in the header record are mandatory.
3. The fields are length delimited and the length of each field is indicated in the table below.
4. All fields that do not fill the entire field will be padded with zeros or spaces as indicated under the *Description* column.

Field #	Field Name	Length	Data Type	Format	Description
1	Transaction Type	1	CHAR		Value = H
2	File Name	35	STRING	See section <a href="#">1.2.2</a>	RPAD spaces.

Field #	Field Name	Length	Data Type	Format	Description
3	File Creation Timestamp	14	DATE	YYYYMMDDHHMNSS	Hours in 24-hour format
4	File Sequence No.	8	NUMBER		This sequence no. will be shared across both NEW and UPD files being sent to the collection agency.  E.g., The first file sent will have the sequence no. 00000001. The second file sent, which could be a NEW or UPD file will have the sequence no. 00000002

### 24.6.1.3.2.Detail Record

1. All detail records will begin with an N denoting a new record.
2. The fields are length delimited and the length of each field is indicated in the table below.
3. All fields, that do not fill the entire field, or are optional, will be padded with zeros or spaces as indicated under the *Description* column.

Field #	Field Name	Length	Data Type	Optional	Format	Description
1	Transaction Type	1	CHAR			Value = N (New record)
2	Account Number	16	STRING			RPAD spaces
3	Account Type	2	NUMBER			LPAD zeros; Values = 01 for Private Accounts, 02 for Commercial Accounts, 03 for Business Accounts.
4	Agency Code	4	STRING			Values =
5	First Name	25	STRING			RPAD spaces; Contact First Name for Business Accounts
6	Middle Name	25	STRING	Y		RPAD spaces; Contact Middle Name for Business Accounts
7	Last Name	25	STRING			RPAD spaces; Contact Last Name for Business Accounts
8	Company Name	50	STRING	Y		RPAD spaces. Business accounts only.
9	Address Line 1	40	STRING			RPAD spaces
10	Address Line 2	40	STRING	Y		RPAD spaces
11	City	28	STRING			RPAD spaces
12	State	2	STRING			
13	Zip Code	6	STRING			RPAD spaces
14	ZipPlus4	4	NUMBER	Y		Spaces if not available.
15	Country	4	STRING			RPAD spaces
16	Day Phone	10	NUMBER	Y		No special characters. E.g., 2403141553 or spaces
17	Evening Phone	10	NUMBER	Y		No special characters. E.g., 2403141553 or spaces
18	Original Balance When Revocation Process Started	9	SIGNED NUMBER		1,6,2	First field is sign indicator (-), then LPAD zeros for remaining 8 NUMERIC fields. E.g., a negative balance of \$75.25 is represented as -00007525

Field #	Field Name	Length	Data Type	Optional	Format	Description
19	Date Revocation Process Started	8	DATE			YYYYMMDD
20	Tag Deposit Forfeited	9	SIGNED NUMBER		1,6,2	This field will reflect the existing tag deposit for the account when it was revoked.  First field is sign indicator (+), then LPAD zeros for remaining 8 NUMERIC fields. E.g., a positive amount of \$30.00 is represented as +00003000
21	Lost Tag Fees	9	SIGNED NUMBER		1,6,2	This field will reflect the lost tag fees charged to the account when it was revoked.  First field is sign indicator (-), then LPAD zeros for remaining 8 NUMERIC fields. E.g., a negative amount of \$50.00 is represented as -00005000
22	Account Revocation Fee	9	SIGNED NUMBER		1,6,2	This field will reflect the account revocation fee that was charged to the account when it was revoked.  First field is sign indicator (-), then LPAD zeros for remaining 8 NUMERIC fields. E.g., a negative amount of \$25.00 is represented as -00002500
23	Account Balance After RVKF	9	SIGNED NUMBER		1,6,2	Current balance before account goes to RVKF status without any fees being applied.  First field is sign indicator (-), then LPAD zeros for remaining 8 NUMERIC fields. E.g., a negative balance of \$90.25 is represented as -00009025
24	Date Went RVKF	8	DATE			YYYYMMDD
25	Current Balance For Collection	9	SIGNED NUMBER		1,6,2	This reflects the most recent collection amount before account goes to collection agency. This amount is inclusive of all fees and credits applied.  First field is sign indicator (-), then LPAD zeros for remaining 8 NUMERIC fields. E.g., a negative balance of \$188.25 is represented as -00018825
26	Violation Balance When Sent For Collection	9	SIGNED NUMBER		1,6,2	Current violation balance before account goes to collection agency.  First field is sign indicator (+ / -), then LPAD zeros for remaining 8 NUMERIC fields. E.g., a negative balance of \$15.25 is represented as -00001525

### 24.6.1.3.3.Trailer Record

1. The trailer record will be a single line and will appear as the last line in the file.
2. The trailer record will start with an E as indicated in the field details below.
3. All fields in the trailer record are mandatory.
4. The fields are length delimited and the length of each field is indicated in the table below.

5. All fields that do not fill the entire field will be padded with zeros or spaces as indicated under the *Description* column.

Field #	Field Name	Length	Data Type	Format	Description
1	Transaction Type	1	CHAR		Value = E
2	Total no. of NEW transactions	9	NUMBER		LPAD zeros
3	Total dollar amount – NEW Transactions	12	SIGNED NUMBER	1,9,2	First field is sign indicator (-), then LPAD zeros for remaining 9 NUMERIC fields. E.g., a negative balance of \$150,000.25 is represented as -0001500025

## 24.7. Acknowledgement File – From Collection Agency to Xerox

### 24.7.1. Description

The collection agency will acknowledge the receipt of the SEND files through acknowledgement files. The intent is to confirm proper transmission of the SEND file and the ability to open, read and process the records in it.

### 24.7.2. File Name

*{DAT file name w/o .DAT extension being acknowledged}.ACK*

### 24.7.3. File Layout

The record in the acknowledgement file will be a single line.

All fields in the trailer record are mandatory.

The fields are length delimited and the length of the fields is indicated in the table below.

All fields that do not fill the entire field will be padded with zeros or spaces as indicated under the *Description* column.

Field #	Field Name	Length	Data Type	Format	Description
7	Original File Name being Acknowledged	35	STRING	See Section <a href="#">1.2.2</a> & <a href="#">1.3.2</a>	
8	Original File Sequence Number	8	NUMBER		
9	File Processing Status	2	NUMBER		00 = Success, 01 = Failure to read.
10	Acknowledgement File	14	DATE		YYYYMMDDHHMNSS in 24-hour format

Field #	Field Name	Length	Data Type	Format	Description
	Creation Timestamp				
11	Total no. of transactions from SEND file	9	NUMBER		LPAD zeros
12	Total dollar amount from SEND file	12	SIGNED NUMBER	1,9,2	First field is sign indicator (-), then LPAD zeros for remaining 9 NUMERIC fields. E.g., a negative balance of \$150,000.25 is represented as -00015000025

#### 24.7.4. Violation Notice Status Code Mapping Table

Status Code	Description
0004	OPEN
0005	PAID FULL
0006	PAID PART
0007	DISMISSED
0009	UNCOLLECTABLE



# 25. Appendix A

---

## 25.1. CTOC incoming toll file

```
==> sdgg_20040508_002409.tol <==  
#HEADER,TOLL,000216,05/08/2004,SD,GG,05/09/2004,00:24:09  
081F8339,0000025184,05/08/2004,11:12:29,00000.50,0015,03  
#TRAILER,000216,05/08/2004,000001,0000000.50
```

```
==> srgg_20040508_031323.tol <==  
#HEADER,TOLL,000366,05/08/2004,SR,GG,05/08/2004,03:13:23  
#TRAILER,000366,05/08/2004,000000,0000000.00
```

```
==> tcgg_20040508_220000.tol <==  
#HEADER,TOLL,000493,05/08/2004,TC,GG,05/08/2004,22:00:00  
081E6488,0117704322,05/07/2004,22:09:19,00001.00,3491,12  
081F63AB,0117739329,05/08/2004,06:53:49,00002.50,1191,13  
08240ADD,0117742568,05/08/2004,07:45:41,00002.50,1191,12  
081F7168,0117745531,05/08/2004,08:12:38,00001.00,1217,02  
.  
.  
#TRAILER,000493,05/08/2004,000053,0000085.00
```

## 25.2. CTOC pay by plate file

```
TRAILER,000642,05/07/2004,000425,0000866.50
```

```
#HEADER,PAYBYPLATE,000365,05/08/2004,SR,GG,05/08/2004,03:13:26  
2UWT944 ,0521881749,CA,05/06/2004,10:15:21,00001.70,4001,02  
#TRAILER,000365,05/08/2004,000001,0000001.70
```

```
#HEADER,PAYBYPLATE,000493,05/08/2004,TC,GG,05/08/2004,22:00:00  
4LTN203 ,0117710465,CA,05/03/2004,09:25:47,00001.50,2257,13  
4DOB430 ,0117717029,CA,05/05/2004,16:23:20,00001.00,1215,02  
4EYV460 ,0117717046,CA,05/05/2004,16:30:08,00003.00,1190,12  
#TRAILER,000493,05/08/2004,000003,0000005.50
```

SANDAG Agency doesn't send Pay by Plate file

## 25.3.CTOC Recon Toll

#HEADER,RECONCILE,000338,05/07/2004,SD,GG,05/08/2004,17:34:13  
 081E1EB4,0105739459,05/07/2004,06:59:26,00004.00,4010,08,A  
 0FCEE2F4,0105739146,05/07/2004,06:53:41,00004.00,4010,08,A  
 0FCEFAAB,0105736534,05/07/2004,06:13:17,00004.00,4010,02,A  
 0FCEFB5,0105751317,05/07/2004,09:20:58,00004.00,4010,09,A  
 .  
 .  
 #TRAILER,000338,05/07/2004,000005,0000020.00,000005,0000020.00

#HEADER,RECONCILE,000479,05/06/2004,SR,GG,05/08/2004,03:13:28  
 08136C97,0105680708,05/06/2004,07:09:03,00004.00,4010,10,A  
 0814A1AB,0105695434,05/06/2004,09:48:49,00004.00,4010,03,A  
 0814F261,0105696915,05/06/2004,10:14:02,00004.00,4010,08,A  
 081429D9,0105700559,05/06/2004,11:16:47,00004.00,4010,08,A  
 .  
 .  
 #TRAILER,000479,05/06/2004,000008,0000032.00,000008,0000032.00

#HEADER,RECONCILE,000236,05/06/2004,TC,GG,05/07/2004,06:03:54  
 080398F2,0105727284,05/06/2004,19:36:05,00004.00,4010,02,A  
 08068165,0105711775,05/06/2004,15:11:59,00004.00,4010,08,A  
 08068CAB,0105684272,05/06/2004,07:46:29,00004.00,4010,07,A  
 0806A793,0105688797,05/06/2004,08:33:47,00004.00,4010,02,A  
 .  
 .  
 #TRAILER,000236,05/06/2004,000073,0000292.00,000073,0000292.00

## 25.4.CTOC Recon Pay by Plate

#HEADER,PLATERECON,000329,05/07/2004,SD,GG,05/08/2004,19:01:10  
 #TRAILER,000329,05/07/2004,000000,0000000.00,000000,0000000.00

#HEADER,PLATERECON,000504,05/06/2004,SR,GG,05/08/2004,03:13:34  
 6B53850 ,0045825303,CA,04/29/2004,21:27:02,00004.00,4010,08,A  
 #TRAILER,000504,05/06/2004,000001,0000004.00,000001,0000004.00

#HEADER,PLATERECON,000242,05/06/2004,TC,GG,05/07/2004,06:03:58  
 3RWW754 ,0045825403,CA,04/29/2004,22:59:49,00004.00,4010,08,A  
 4EBF313 ,0045826055,CA,04/30/2004,07:53:54,00004.00,4010,10,A  
 4DKU516 ,0045826198,CA,04/30/2004,08:24:13,00004.00,4010,09,A  
 4AXS202 ,0045826499,CA,04/30/2004,09:22:15,00004.00,4010,09,A  
 .  
 .  
 #TRAILER,000242,05/06/2004,000007,0000028.00,000007,0000028.00

## 25.5.CTOC Tag file

```
#HEADER,TAGS,INIT,000354,05/09/2004,SD,GG,05/09/2004,00:24:41
081E000B,A,V,N,N,N
081E0040,A,V,N,N,N
081E0041,A,V,N,N,N
081E0044,A,V,N,N,N
.
.
#TRAILER,000354,05/09/2004,00025840
```

```
#HEADER,TAGS,INIT,001162,05/08/2004,SR,XX,05/08/2004,03:10:02
0810002F,A,V,N,N,N
0810003B,A,V,N,N,N
08100049,A,V,N,N,N
0810006A,A,V,N,N,N
.
.
#TRAILER,001162,05/08/2004,00143110
```

```
#HEADER,TAGS,INIT,472546,05/08/2004,TC,GG,05/08/2004,22:00:00
08080180,A,V,N,N,N
0808D6E2,A,V,N,N,N
080C0256,A,V,N,N,N
080C0257,A,V,N,N,N
.
.
#TRAILER,472546,05/08/2004,00566216
```

## 25.6.CTOC license plate file

```
#HEADER,PLATES,INIT,001183,SR,XX,05/08/2004,03:11:08
00000 ,CA,A,08/30/2001
000000 ,CA,A,08/12/2002
0000035 ,CA,A,07/14/2002
0000036 ,CA,A,07/14/2002
.
.
#TRAILER,001183,05/08/2004,00275483
```

```
#HEADER,PLATES,INIT,472546,TC,GG,05/08/2004,22:00:00
1NWK560 ,CA,A,03/18/1996
1NWK560 ,CA,D,02/06/2002
2ECU696 ,CA,A,03/18/1996
2ECU696 ,CA,D,10/27/1999
.
.
```

#TRAILER,472546,05/08/2004,01405038

No plate file was received from SANDAG. Golden Gate CSC contacts (Paul Redman or Hugh) shall provide a sample that'll go here when available.

However SANDAG does not generate pay-by-plate files for posting at BATA CSC.

# 26. Appendix B GGB

Below is a list of reason codes used in GGB response files.

## 26.1. List of CSC\_REASON\_CODES

List of codes applicable to Home Agency transactions		
CSC Reason Code	Status	Description
01	TOLL	Home Agency toll posted successfully as a normal ETC transaction
02	VTOL	Home Agency toll posted successfully as a ETC violation transaction
11	TAGINV	Tag Inventory - Tag is currently in the Vector's Inventory status. This status indicates that Tag is in CSC. Any transactions received on a tag will be a violation transaction and go through the violation processing system)
12	TAGLOST	Tag Lost
13	TAGSTOLEN	Tag Stolen
14	TAGRETURNED	Tag in shipping, Returned Defective, Tag Returned
15	TAGDAMAGED	Tag Damaged
16	INVTAG	Invalid tag
22	DUPL	Duplicate transaction – transaction occurred on the same plaza/lane for a given device at the same date/time.
24	INVACC	Invalid Account
25	INVACCLSP	Invalid Account Closing Pending
26	INVACPEND	Invalid Account Pending
27	INVACRVKF	Invalid Account Revoked Final
28	INVACCLOS	Invalid Account Closed
29	POACHING	Poaching transaction – transaction occurred on same tag and date and time within 5 minutes on the same lane.
31	XLANE	Cross Lane transaction – transaction occurred on same tag and date and time on the same plaza but a different lane.
51	QINVPLAZA	Transaction rejected as invalid due to an invalid plaza
52	QINVDATE	Transaction rejected as invalid due to invalid date
53	QINVAGENCY	Transaction rejected as invalid due to invalid agency code
54	QNONVTRX	Unpostable ETC txn - Invalid tag/account status
98	REQNOTFOUND	Transaction request (tol_trx_type = 3) from GGB Host is

		not found at CSC
99	OLDREQ	Transaction request (tol_trx_type = 3) from GGB Host is beyond 180 days.
<b>CSC Reason Codes for CTOC transactions</b>		
<b>CSC Reason Code</b>	<b>Status</b>	<b>Description</b>
06	POST	Transaction posted successfully to a CTOC Agency account due to a tag read at the lanes.
07	PPST	Transaction posted successfully to a CTOC Agency account as a pay-by-plate transaction.
43	TAGB	Transaction happened on a tag with a bad status
45	RJDP	Transaction rejected as duplicate – CTOC transaction occurred on the same plaza/lane for a given device at the same date/time.
46	OLD1	Transaction rejected – Attempt to post the transaction to a closed account after the specified posting limit – 30 days or 60 days (configurable)
48	RINV	Transaction rejected as invalid due to invalid detail data – i.e. if the tag in the transaction is out of range etc.
<b>CSC Reason Codes for Violation transactions</b>		
09	ITOL	Home Agency toll posted successfully to a valid account using license plate information.
100	VCSCRCV	Violation transaction received at CSC
101	VCSCIMGREV	Violation image reviewed at CSC
102	VIMGREVRJT	Violation transaction rejected after image review
103	VPOSTCSC	Violation transaction postable to account at CSC
107	VDMVS	Violation transaction sent to DMV
108	VDMVR	Violation transaction received from DMV
109	VDMVRJT	Violation transaction rejected after DMV request
110	VCITE	Violation transaction sent to notice
111	VDMVHLD	Violation transaction in DMV hold
112	VDMVPAY	Violation transaction paid at DMV Payment
113	VDMVREL	Violation transaction paid at DMV Release
114	VPFULL	Violation transaction paid full
115	VPPART	Violation transaction paid part
116	VCOLLECT	Violation transaction sent to collection – Not in active use
117	VDISS	Violation transaction dismissed – used for all violations written off by Xerox
118	VAUTHREJ	Violation transaction authority reject
206	OCRITOLAWAY	Toll posted successfully to a valid away agency account using license plate information
209	OCRITOLHOME	Toll posted successfully to a valid home agency account using license plate information
210	ONETOL	Toll posted successfully to a One Time Payment
211	LTOL	Toll posted successfully to a License Plate Toll Account
212	INVTOL	Invoiced transaction paid as an invoice
213	PPINVTOL_TO_VIO	Invoiced transaction for which the RCSC received partial payment and then sent out a violation notice for the remaining balance

214	NIXIE_REJECT	Nixie Reject - Not sent
215	INV_TO_ITOL	Invoiced transaction posted to a FasTrak Account
216	INV_TO_LTOL	Invoiced transaction paid to a LPT account
217	INV_TO_ONETOL	Invoiced transactions paid by a One-Time Payment
220	2ND_VIO_SENT	2nd Violation Notice Sent
221	INV_SENT	Invoice Sent
222	PRE_INVOICE	Transactions with LPN and address ready to be placed on invoice
223	2 <sup>nd</sup> _INV_SENT	Invoice dismissed and new invoice sent

## 26.2. List of Interim and final transaction states in Vector

CSC_RESOLV_CODE	STATUS	Description	Comments
09	ITOL	Home Agency toll posted successfully to a valid account using license plate information.	This is a final state.
100	VCSCRCV	Violation transaction received at CSC	Interim state indicating that the violation has been processed at CSC.
101	VCSCIMGREV	Violation image reviewed at CSC	Interim state indicating violation has completed image review
102	VIMGREVRJT	Violation transaction rejected after image review	Final state indicating image was rejected after image review
103	VPOSTCSC	Violation transaction postable to account at CSC	Interim state indicating violation transaction was associated with an account
107	VDMVS	Violation transaction sent to DMV	Interim state indicating DMV request
108	VDMVR	Violation transaction received from DMV	Interim state indicating response received from DMV
109	VDMVRJT	Violation transaction rejected after DMV request	Final state indicating violation was rejected (maybe name and address unavailable)

<b>CSC_RESOLV_CODE</b>	<b>STATUS</b>	<b>Description</b>	<b>Comments</b>
110	VCITE	Violation transaction sent to notice	Interim state indicating that the violation is now a "toll evasion"
111	VDMVHLD	Violation transaction in DMV hold	Interim state indicating violation is in DMV Hold
112	VDMVPAY	Violation transaction paid at DMV Payment	Final state indicating payment received
113	VDMVREL	Violation transaction paid at DMV Release	Final state indicating DMV release
114	VPFULL	Violation transaction paid full	Final state indicating full payment was processed for the violation
115	VPPART	Violation transaction paid part	Interim state indicating partial payment was received. (Could possibly be waiver of admin fees based on business rules)
116	VCOLLECT	Violation transaction sent to collection – Not in active use	Final state
117	VDISS	Violation transaction dismissed	Final state indicating violation is dismissed
118	VAUTHREJ	Violation transaction authority reject	Final state indicating violation is rejected (possibly due to business rules)
206	OCRITOLAWAY	Toll posted successfully to a valid away agency account using license plate information	Final state
209	OCRITOLHOME	Toll posted successfully to a valid home agency account using license plate information	Final state
210	ONETOL	Toll posted successfully to a One Time Payment	Final state
211	LTOL	Toll posted successfully to a License Plate Toll Account	Final state
212	INVTOL	Invoiced transaction paid as an invoice	Final or Interim state
213	PPINVTOL_TO_VIO	Invoiced transaction for which the RCSC received partial payment and then sent out a violation notice for the remaining balance	Interim state
214	NIXIE_REJECT	Nixie Reject - Not sent.	Interim state



<b>CSC_RESOLV_CODE</b>	<b>STATUS</b>	<b>Description</b>	<b>Comments</b>
215	INV_TO_ITOL	Invoiced transaction posted to a FasTrak Account	Final state
216	INV_TO_LTOL	Invoiced transaction paid to a LPT account	Final state
217	INV_TO_ONETOL	Invoiced transactions paid by a One-Time Payment	Final state
220	2ND_VIO_SENT	2nd Violation Notice Sent	Interim state
221	INV_SENT	Invoice Sent	Interim state
222	PRE_INVOICE	Transactions with LPN and address ready to be placed on invoice	Interim state
223	2 <sup>nd</sup> _INV_SENT	Invoice dismissed and new invoice sent	Interim state
206	OCRITOLAWAY	Toll posted successfully to a valid away agency account using license plate information	Final state
209	OCRITOLHOME	Toll posted successfully to a valid home agency account using license plate information	Final state
210	ONETOL	Toll posted successfully to a One Time Payment	Final state

# 27. Appendix C

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## 27.1. Transaction Processing Business Rules

Transaction Processing rules depend on several factors including the tag status at the time of the transaction, the facility on which the transaction occurred and whether or not the transaction applies to a Home account. The following categories and rules are established.

### HOME Facilities

Transactions received from Home facilities (GGBHTD and Caltrans) are first checked for data validity. The following transactions are rejected without further processing.

- Transactions with invalid plaza, lane, plaza/lane pair or class.
- Transactions with an invalid date or time.
- The transponder ID is not within an accepted range for Home agencies according to CTOC Technical Specification for Interagency Electronic Data Interchange.

All transactions will be processed provided they are received by the RCSC within one year of the transaction date. Those over a year will have a reject code. This is true for both ETC and violations. Otherwise transactions are processed in accordance with the following rules:

### Valid Tag, Home Account

- All Home tagged transactions will be posted to Home accounts if the in-lane status of the tag at the time of the transaction was valid (or non-revenue, low balance, etc). These transactions are posted if the account is open regardless of the account balance and may drive the account balance negative. The in-lane status of the tag is reported to the CSC in the transaction record. These transactions will be posted as "TOLL" (aka ETC Toll).

In exception to this rule, certain transactions will be rejected by the CSC for the reasons listed below. These transactions were indicated as valid in the lane, and therefore have no image and cannot be processed as violators. Rejected transaction will be reconciled as rejected with the appropriate reason code but will not be further processed by the CSC. In all cases listed below the condition for rejection is tested against the account and is not subject to the time when the transaction is received or processed by the CSC. Reject conditions are:

1. Duplicate transactions. A duplicate transaction is one having the same **transponder ID, plaza, lane date and time** as a transaction previously posted to the account. The duplicate transaction is rejected. (Note that the vehicle class may be different in the duplicate transaction).

2. Skip read transaction. A skip read transaction is defined as a transaction with the same **transponder ID, plaza and lane** and is within 5 minutes (plus or minus) of another transaction previously posted to the account. The 5-minute filter can be configured and 1 minute is the lowest configurable value. The skip read transaction is rejected. (Note that under this rule, depending on CSC processing sequences, the transaction that is rejected could have occurred before or after the transaction that was posted. In addition the vehicle class may be different in the rejected transaction.)
3. Cross lane read transactions. A cross lane read transaction is defined as a transaction with the same **transponder ID and plaza** and is within 5 minutes (plus or minus) of another transaction previously posted to the account. The 5-minute filter can be configured and 1 minute is the lowest configurable value. The cross lane read transaction is rejected. (Note that under this rule, depending on CSC processing sequences, the transaction that is rejected could have occurred before or after the transaction that was posted. In addition the vehicle class may be different in the rejected transaction.)
4. Reported Lost/Stolen transactions. A reported lost/stolen transaction is a transaction where the tag is valid as indicated in the lane but whose date and time is later than the time that it was reported as lost/stolen to the CSC.
5. Closed account – If the account is closed, the transaction is rejected.

A report shall be provided showing transactions that were rejected.

#### **Invalid Tag, Home Account**

- All Home tagged transactions will be posted to Home accounts if the lane reported the transaction as a violation (invalid tag status) but the account is open with a positive balance at the time of posting. The transaction is posted at the ETC rate for that class and is not processed as a violation. The transaction will be posted as “VTOL” (aka tagged violation toll, or paid-on-import). Note that this rule does **not** apply to transactions with a tag status of “Lost or Stolen”. In this case the transaction is immediately processed as a violation.

At the time of posting the transaction will be subject to the reject rules above. If the transaction meets any of the reject criteria (1 – 5) it will not be posted and will be processed as a violation.

#### **Valid Tag, CTOC Account**

- All CTOC transactions (away tag on home facility) with a valid (i.e. “Valid or “Non Revenue”) tag as reported in the transaction will be sent to the CTOC agency for payment without further checking by the RCSC. If rejected by the CTOC agency, the CSC will check the transaction against the appropriately received tag status file for the corresponding date and time to ensure the rejection is correct. If the rejection was not correct, the CSC shall notify BATA and proceed to resolve the issue. In support of this process, the CSC shall maintain received CTOC tag status files for a period of time consistent with CTOC agreements regarding the age of transactions. Transactions that are sent to the CTOC agency for payment will be recorded as “CTOLL” (aka CTOC ETC Toll) transactions.

These transactions are subject to the reject rules (1 – 3) above as they apply to the current and previous CTOC transaction **file** that is sent to the CTOC agency. For example a transaction is checked to ensure that duplicate transactions are rejected prior to sending to a CTOC agency.

### **Invalid Tag, CTOC Account**

- All CTOC transactions (away tag on home facility) with an invalid tag as reported in the transaction shall be processed as violations.

### **Pay-by-plate**

- Untagged transactions are initially indicated as violations and an image of the license plate is captured. License plates numbers obtained through image review or OCR with sufficient confidence level will be submitted to Vector to determine if the transaction can be posted.

### **Home Accounts**

- If the license plate number is found to belong to a Home account that is open with a positive balance, the transaction will be posted at the ETC rate and the violation is not processed. The transaction will be posted as “ITOL” (aka image toll). Otherwise the transaction continues through the violation process (including review against CTOC plate files). License plates shall match to only one account for each transaction date.

ITOL transactions that can be posted to an account are subject to the following reject rule:

- If there is another transaction posted to the account for the same plaza and lane and within five seconds (plus or minus) of the posted transaction, the ITOL transaction is rejected with no further processing. BATA reserves the right to revise this rule so that plate transactions are processed as violations when they occur within five seconds of another transaction for the same plaza and lane and posted to the same account.

### **CTOC Accounts**

- If the license plate number does not belong to a Home account it is checked against the CTOC license plate files for the time and date of the transaction. In the event of duplicate license plates in the CTOC plate files, the license plate with the most recent effective date shall be used. (This requires that the CSC maintain received CTOC plate status files for a period of time consistent with CTOC agreements regarding the age of transactions). If the plate number had been indicated as valid by the CTOC agency for the date of the transaction it will be submitted to the CTOC agency at the ETC rate and the violation is not processed. The transaction will be recorded as “CITOL” (aka CTOC image toll). Otherwise the transaction is pursued as a violation.

### **CTOC Reconciliation**

Tagged and Plate transactions that are sent to a CTOC agency for payment and are rejected by CTOC are subject to administrative review. No further automatic processing of these transaction has been defined at this time.

In support of billing a CTOC agency, a report will be generated each month consisting of the CTOC agency generated (and received by BATA) **reconciliation files** (tag and plate) for the transaction files sent to that agency for that month. At the option of BATA the RCSC will be required to generate this

same report based on transaction files sent to the CTOC agency for payment. This requirement is necessary in the event the CTOC agency does not generate timely reconciliation files.

### **AWAY (CTOC) Facilities**

Transactions received from CTOC agencies at the RCSC are for trips taken on CTOC facilities by BATA customers (home tag on away facility). These transactions should represent only those for which the BATA CSC indicated that the tag or plate status was valid at the time of the transaction. Transactions received from CTOC agencies are first checked for data validity. The following transactions are rejected without further processing.

- Transactions with an invalid date or time.
- The transponder ID is not within the accepted range for that Agency according to CTOC Technical Specification for Interagency Electronic Data Interchange.

Otherwise transactions are processed in accordance with the following rules:

### **Tag Transactions**

- Vector will attempt to post all tagged transactions received from CTOC agencies. These reciprocal transactions will be compared to the associated tag status file (sent via ftp to the CTOC agency) for the day of the transaction. (This requires that the CSC maintain transmitted CTOC tag status files for a period of time consistent with CTOC agreements regarding the age of transactions and be aware of tag status files that were not transmitted to CTOC agencies due to processing or transmission problems). If the tag was in a valid status, the transaction will be posted. If the tag was invalid, it will be rejected and payment will not be made to the CTOC agency for that transaction.

At the time of posting the transaction will be subject to the reject rules above. If the transaction meets any of the reject criteria (1, 4 & 5) above it will not be posted to the account. However, with the exception of duplicate transactions (rejection criteria #1), because the tag was indicated as valid in the lane the amount of transaction will be paid to the CTOC agency. Reports must reflect this condition.

### **Plate Transactions**

- Vector will attempt to post all plate transactions (home customer on away facility) received from CTOC agencies. These reciprocal transactions will be compared to the associated plate status file (sent via ftp to the CTOC agency) for the day of the transaction. (This requires that the CSC maintain transmitted CTOC plate status files for a period of time consistent with CTOC agreements regarding the age of transactions). If the plate was in a valid status, the transaction will be posted. If the tag was invalid, it will be rejected and payment will not be made to the CTOC agency for that transaction.

CTOC plate transactions that can be posted to an account are subject to the following reject rule:

- If there is another transaction posted to the account for the same plaza and lane and within five seconds (plus or minus) of the posted transaction, the CTOC plate is rejected as a duplicate with no further processing. (Note that these may then be processed as violations by the CTOC agency depending on their business rules).

The required time to maintain received and transmitted tag and plate status files is 180 days.

In support of payment to a CTOC agency, a report will be generated each month consisting of the BATA CSC generated (and sent to that agency) **reconciliation files** (tag and plate) for the transaction files received from that agency for that month.

# 28. Appendix D

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## 28.1. ACK File Processing

The purpose of the Acknowledgement File (ACK) is to provide a mechanism for verifying proper receipt of transmitted files by the sending party. The ACK file will provide an indication of error or no error as determined by the party receiving the original file. The indication of an error in the ACK file means that the receiving party will not process the corresponding file. The acknowledgement process (generating an ACK file) applies to all files transmitted between the Agency hosts and the Regional Customer Service Center with the exception of the Violation Image Data File (.VDF) and the ACK file itself (i.e. there is no need to ACK an ACK file).

It is the responsibility of the sending party to ensure that an ACK file was received for each file transmitted and takes prescribed action in the event that the ACK file indicated an error or an ACK file was never received. Both the party generating the ACK file and the party receiving the ACK file shall log all ACK files in a database. The ACK file log may be used to resolve problems or provide statistical information via ad-hoc queries.

Conditions may arise that require manual intervention or attention to a reported error. It is the responsibility of the sending party to initiate such action in the appropriate time and it is the responsibility of the receiving party to respond to requests (in the appropriate time) to assist in the resolution of the issue.

### **ACK file generation and processing:**

After creation of the ACK file, the recipient transmits the ACK file back to the sender. It then becomes the responsibility of the original file's sender to examine the contents of the ACK file and, if a non-zero "return code" is found, investigate the problem, correct the file and transmit (see chart) the corrected file back to the recipient for reprocessing. To assist the sender in diagnosing the problem, it is recommended that the recipient provide the sender (via e-mail or other means) with whatever log files are available that detail the nature of the problem detected with the file. Utilization of an automated process which detects all "01" values received and notifies appropriate support staff (via e-mail or other means) is preferred so that problem resolution can be expedited and is not dependent on manual review of processing results.

Receiving an ACK File – ACK files, like other files in the CSC/Plaza interface are "pushed" to the recipients drop-box by the creator of the file and "pulled" from that same area by the receiver of the file. The system software should ensure that the common area is polled periodically and frequently (at least every 15 minutes) to ensure that all files, including ACK files, are received promptly.

ACK file not received – Determining that an ACK file was not received depends on the amount of time the sending party waits for the ACK file before the decision is made. The appropriate amount of "wait-time" depends on the nature of the file. The wait-time timer starts when the transmitted file is pushed to the shared directory or device. Suggested wait-times for each file type are indicated in the ACK file

processing chart below. In any case if it is determined that an ACK file was not received, an error is generated requiring manual intervention (a phone call, etc.). The sending party may or may not continue sending subsequent files of the same type (see ACK file processing chart). Note that the wait-time is independent of the time indicated in the body of the ACK file itself. The recipient is unaware and is not impacted by the sending party's wait-time expiration. Therefore it is possible that an ACK file could be sent to the sending party after the sending party wait-time had expired. However it is expected that the required manual intervention will resolve the issue.

If the wait-time expires prior to receiving an ACK, the sending party will generate an automatic e-mail to a designated list of people. Such e-mails will then continue every eight hours until the problem is resolved.

ACK file received indicating no error – In this case the sending agency logs the ACK file information into the database and continues normal processing.

ACK file received indicating an error – If a return code of 01 is received for any file, the sending and receiving entities will work to resolve the specific issue and recreate and resend the file.

### File validation rules

The following chart indicates the required file validations and the suggested return codes. The agencies should review the processing rules for each file type and add additional return codes if necessary. If detailed return codes are not desired, all errors may default to a return code of 01.

Return Code	File Validation
00	No Errors
01	Generic File Error – Not specifically defined.

## Processing rules

### Tag Files

The Plaza Host will periodically poll the transfer area for tag files. When a new file is received the Plaza Host will load the file and perform certain validations. In all cases the Plaza Host will generate an ACK file and transmit this back to the CSC. The ACK file will contain a SUCCESS code (value 00) if the tag file passed validation and was sent to the lanes or a FAILURE code (value 01) if the tag file failed validation.

The first tag file for each day should be received by 4 am. If it is not received the Plaza Host will automatically send an email to the CSC and Sysops stating the “first tag file is late or missing”. No other action will be taken and this check will only be for the 4 am file.

### GGB ETC and VIO Recon files

The GGB Host will periodically generate and transmit ETC and VIO files to the CSC. GGB will periodically poll the area ACK files are transferred to the Host by the CSC.



When an ACK file is received the GGB database will be updated. If the ACK file shows a FAILURE code the GGB Host will regenerate and resend the original file. A failure count will be maintained and after 3 concurrent failures of a single file an email will be sent to the GGB System Operators.

If an ACK file is not received within 2 hours of an ETC or VIO file being transmitted to the CSC an email will be generated to the CSC and GGB System Operators. Another email will be sent every 2 hours to a designated list escalating the issue until the situation is resolved.

A recon file should be received within 9 hours of an ETC or VIO Transaction file being transmitted to the CSC and no later than 10 am for the previous day's files.

GGB will periodically poll the area recon files are transferred to the Host by the CSC. When a new file is received GGB will load the file and perform certain validations. In all cases the GGB Host will generate an ACK file and transmit this back to the CSC. The ACK file will contain a SUCCESS code (value 0) if the recon file passed validation and was sent to the lanes or a FAILURE code (value 01) if the recon file failed validation.

A recon file will always be ACKED with a FAILURE code if it is received before the ACK file for the corresponding ETC or Violation Transaction File.

If a recon file is not received within 9 hours or by 10 am for the previous day's files, the GGB Host will automatically send an email to the CSC and GGB Sysops stating the "recon file is late or missing". This check will be repeated every 2 hours and an email will be sent to a designated list escalating the issue until the situation is resolved.

## VDF Files

The Plaza Host will periodically generate and transmit VDF files to the CSC. No ACK files or validation is used in this interface.

### ACK file Processing Chart

The following table indicates the action taken to a non-zero ACK return code for each of the files defined in the ICD. If an original file is to be corrected and re-transmitted the file name and header information (sequence number, name, create time) must change prior to resending. Both the sending and receiving parties should store the rejected file.

No	File Name	ACK wait time	Sender Action
1	CALTRANS Tag Status File	1 hr	Investigate problem with file and resend after file is repaired (unless a subsequent tag file has already been sent).
2	GGBD Tag Status File	2 hr	Investigate problem with file and resend after file is repaired (unless a subsequent tag file has already been sent).
3	CALTRANS ETC Transaction/Violation File	2 hr	Investigate problem with file and resend after file is repaired. Subsequent files may be sent.

No	File Name	ACK wait time	Sender Action
4	CALTRANS ETC Transaction Reconciliation Summary File	4 hr	Investigate problem with file and resend after file is repaired. Do not close business day or produce reports based on file. Resolve before send subsequent file.
5	CALTRANS ETC Monthly reconciliation file (revenue attached to lane transactions)	24 hr	Investigate problem with file and resend after file is repaired. Resolve before sending subsequent files.
6	GGBD ETC Transaction File	2 hr	Investigate problem with file and resend after file is repaired. Subsequent files may be sent.
7	GGBD Violation File	2 hr	Investigate problem with file and resend after file is repaired. Resolve before sending subsequent files.
8	GGBD ETC Detailed Reconciliation File	Within 24 hours	Investigate problem with file and resend after file is repaired. Subsequent files may be sent.
9	GGBD Violation Reconciliation File	Within 24 hours	Investigate problem with file and resend after file is repaired. Subsequent files may be sent.
10	CALTRANS Transaction Cancellation File	2 hr	Investigate problem with file and resend after file is repaired. Subsequent files may be sent.
11	CALTRANS Business Day File	4 hr	Investigate problem with file and resend after file is repaired. Resolve before sending subsequent files.



		Acknowledgement File Return Codes	
		00	01
		Successfully Received and Verified	Header/Detail Count Discrepancy
Transaction Files	CALTRANS TXN (ETC and violation) files	Process	Do not process. Follow rules -(1)(3)(4)(6)
	GGBD REQ files	Process	Do not process. Follow rules - (1)(3)(4)(6)
	GGBD VIO files	Process	Do not process. Follow rules - (1)(3)(4)(6)
Tag Status Files	CALTRANS Tag files	Process	Do not process. Follow rules - (2)(5)(6)
	GGBD Tag files	Process	Do not process Follow rules - (2)(5)(6)

**Rules:**

1. Originating Agency should rename 'error' file (including Header) to be a unique file (i.e. before re-transmitting, rename original file with a new filename and since the header record also contains the filename (CALTRANS)/sequence# & createdatetime (GGB), the header should change to reflect the new filename/sequence#/createdatetime). VECTOR does not require maintaining any link between the old 'error' file and the new file.
2. Receiving Agency/CSC should utilize the previous valid file. Originating/Receiving Agency/CSC should escalate immediately to the CSC/Host.
3. Originating Agency/CSC should investigate, repair file as needed and resend.
4. File should not be included on any revenue reconciliation reports.
5. Originating Agency/CSC should investigate
6. Receiving Agency/CSC shall use this code to indicate errors in file sanity (like header record count does not match trailer/record length does not match ICD layout).

# 29. Appendix E

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## 29.1. File Sanity Checks

The following validation checks shall be performed by the Agencies on each file received from the RCSC. Any files that fail the indicated validation shall be rejected as per the ICD and have the appropriate values returned to the RCSC as part of the Acknowledgement File:

#	Validation Rule	Files Affected
1.	Header record count is equal to trailer record count is equal to actual record count.	All
2.	Checksum is correct (for files that have a checksum)	All
3.	Filename is formatted as per ICD	All
4.	File can be opened/unzipped	All
5.	Record count of file does not grow by more than 10% of previously processed file nor shrink by more than 2%.  For Golden Gate Bridge the record count is the number of records for all agencies added together.  For Caltrans the tag status file already represents all records for all agencies.	Tag Status File (ETC)
6.	Tag number contains only HEX digits from 00000000 to 07FFFFFF. Tags are within the defined range for the agency.	Tag Status File (Golden Gate Bridge only)
7.	Numeric fields contain only digits 0-9. Numeric fields are within defined ranges. Tags are within the defined range for the agency.	Tag Status File (Caltrans only)

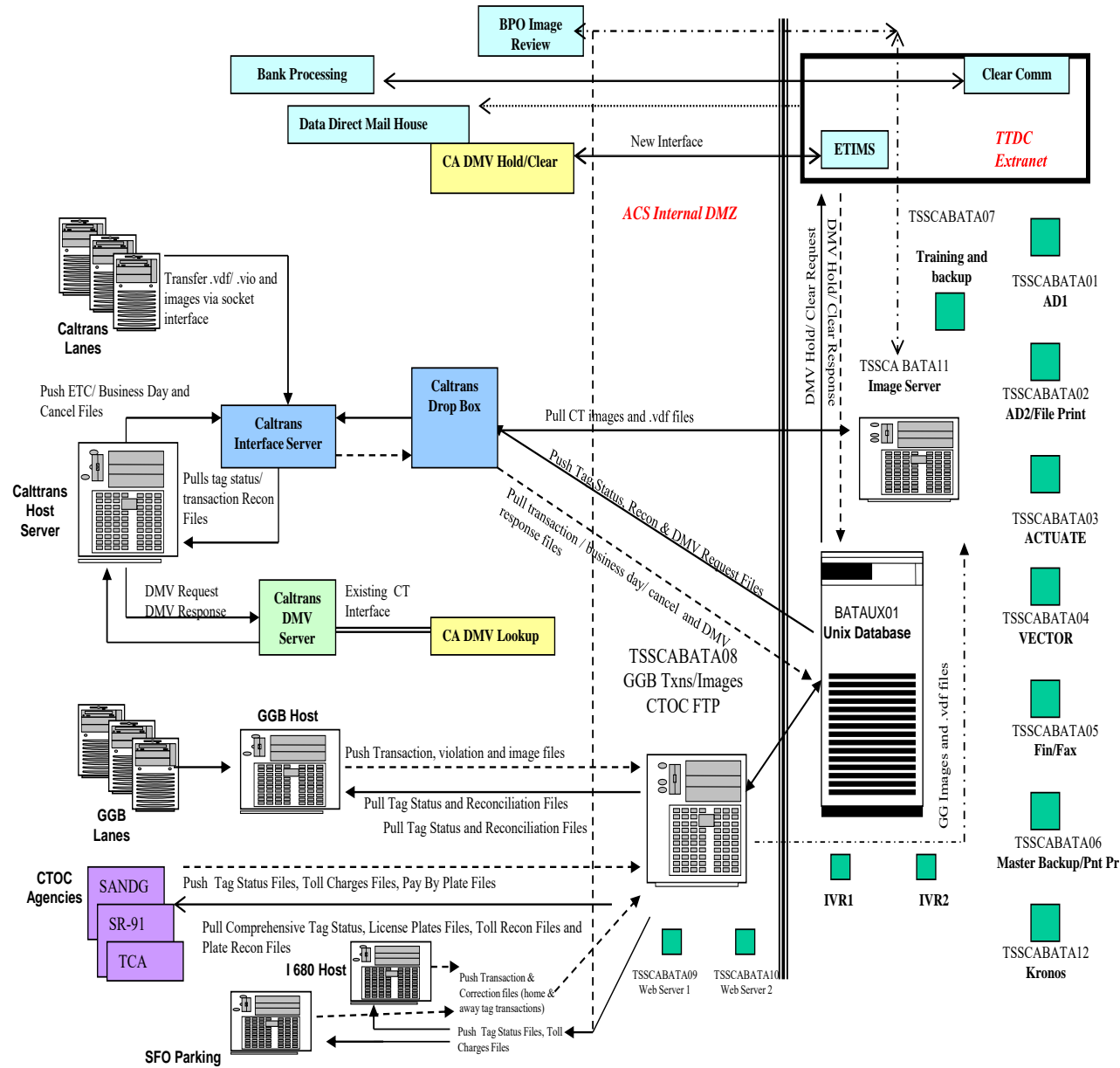
# 30. Appendix F

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## 30.1. File Flow

The flow of all files between the BATA CSC and all the other agencies (including home agencies) is depicted below.

**BATA FILE FLOW**



## 30.2.IP Addresses

The following are the IP address of drop boxes which will be used for the transfer of files between the RCSC and all other agencies (including home agencies)

Location where GGB and CALTRANS will drop their Transaction and Images Files

Agency Name	Drop Box IP Address	Directory
GGBD	10.32.xx.xxxx	/ggxat
CALTRANS	149.136.xx.xxxx	/ctxat

Location where GGB and CALTRANS will Pick Up Tag Status and Reconciliation Files

Agency Name	Drop Box IP Address	Directory
GGBD	10.32.xxx.x	.
CALTRANS	149.136.xx.xxx	/atxct

Location for RCSC System Jobs to drop Tag Status and Reconciliation Files

Agency Name	Drop Box IP Address	Directory
GGBD	10.32.xxx.x	.
CALTRANS	149.136.xx.xxx	/

Location where CTOC Agencies will drop their reciprocity files to RCSC System

Agency Name	Drop Box IP Address	Directory
SR91	12.149.xxx.xxx	/srxat
TCA	12.149.xxx.xxx	/tcxat
SANDAG	12.149.xxx.xxx	/sdxat

Location where RCSC System will drop reciprocity files to CTOC Agencies

Agency Name	Drop Box IP Address	Directory
SR91	ftp.xx.xx.com	/ioptest
TCA	63.199.xx.xxx	/ioptest
SANDAG	208.206.xx.xxx	atxsd

# 31. Appendix G

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## 31.1. Posting/reconciliation scenario for GGB transactions sent to VECTOR CSC.

This section details the different conditions in which a transaction can be received at the VECTOR CSC from the GGB Host and the various ways the VECTOR CSC shall process the transaction, and how the transaction shall be reconciled back to the GGB Host.

The following section provides the rules that shall be applied to posting transactions received at VECTOR CSC from the GGB Host.

- For all tagged transactions, VECTOR shall post transactions based on the state of the account at the **time of posting**. This shall be applicable to transactions on accounts with negative balances. If the VECTOR CSC determines the financial status is good, then the transaction shall be posted.
- For all untagged transactions, VECTOR shall post based on the state of the account at the **time of transaction**. This shall be applicable to transactions on accounts with LOST/STOL tags. If the VECTOR CSC determines the tag is not on the account, then the transaction is processed as a violation and hence he
- If an invalid (including lost/stolen) CTOC transaction is received in the GGB REQ file, it will be reconciled with a reject status and not sent to CTOC for any processing.
- If a valid CTOC transaction is received in the GGB REQ file, it will always be sent to CTOC for processing.
- If a tagged CTOC violation (including lost/stolen) is received in the GGB vio file, it will be looked-up against the tag status file for that day and if found to be in a good status, will be sent to CTOC for processing.
- A violation is converted to a CTOC pay-by-plate transaction under the following conditions –
  - Image review of the violation resulted in a plate number, which matched the CTOC plate file for that day.
  - If the plate was not matched in step 1 above, then the notice process generates a 1<sup>st</sup> notice for this customer. This customer, after receipt of the 1<sup>st</sup> notice, adds the violation plate to their account, with the respective CTOC agency. The agency then sends this plate as a



valid plate in their plate file. The plate sweep process on the CSC picks this plate and dismisses the violation notice.

Similarly any transaction posted at VECTOR CSC will be reconciled back to GGB Host as follows.

- Any tagged transaction posted from REQ files to a home account shall be reconciled back to GGB Host with a PAYMENT\_TYPE = 'A' and CSC reason code = 01.
- Any tagged transaction posted from VIO file to a home account shall be reconciled back to GGB Host with a PAYMENT\_TYPE = 'A' and CSC\_REASON\_CODE = 02.
- Any untagged transaction posted from VIO file to a home account shall be only through image, and reconciled with a PAYMENT\_TYPE = 'A' and CSC\_REASON\_CODE = 09

Scenario	Tag Status	Posting Status	RES File Contents
Normal tagged transaction. Tag status file generated at CSC and loaded correctly at the lanes.	Valid	CSC receives transaction with TOL_TRX_TYPE = 1. CSC determines the account has the right financial status and posts the transaction	CSC reconciles transaction to Host with following information. PAYMENT_TYPE = A CSC_REASON_CODE = 01
Tagged transaction. Tag status generated at CSC shows valid. However lane does not have updated tag status and lanes read tag as invalid (account has negative balance).	Valid at VECTOR CSC Invalid at GGB lanes	CSC receives transaction with TOL_TRX_TYPE = 2 in the VIO file. CSC determines the account had the right financial status at the time of posting and posts to account	CSC reconciles transaction to Host with following information in the VRES file.  PAYMENT_TYPE=A and CSC_REASON_CODE=02
Tagged transaction. Tag status generated at CSC shows tag as valid. However customer reports tag as	Valid at GGB lanes (since transaction happened before tag was reported LOST)	CSC receives transaction with TOL_TRX_TYPE = 1 in REQ file. CSC determines that the tag was on the account at the time of the transaction and hence posts the	CSC reconciles transaction to Host with following information in the RES file. PAYMENT_TYPE= A and CSC_REASON_CODE=01

Scenario	Tag Status	Posting Status	RES File Contents
LOST after transaction happened.		transaction (provided the financial status on the account is good).	
Tagged transaction. Tag status at VECTOR CSC and GGB Host are in sync. Account has negative balance in VECTOR	Invalid tag read at the GGB lanes.	CSC receives transaction with TOL_TRX_TYPE =2 in the VIO file. CSC determines account has no funds. Hence CSC rejects transaction as invalid.	CSC reconciles transaction back to Host with following information in RES file. PAYMENT_FILE=E and CSC_REASON_CODE=24
Untagged transaction. Tag status at VECTOR CSC shows tag as valid. Lane has problems reading the tag.	Tag not read at GGB lanes.	CSC receives transaction with TOL_TRX_TYPE=2 in the VIO file. CSC sends transaction for image review. Transaction is posted after image review.	CSC reconciles transaction back to Host in the VRES file. PAYMENT_TYPE=A CSC_REASON_CODE=09 (ITOL)
GGB .req file contains transactions with tag status of the transactions in the .req file either in (0,2,3)	Tag status in 0,2 or 3	CSC at the time of posting will look at the account status and if the account financial status is GOOD then the transactions shall be posted	Paid-on-Import CSC reconciles transaction to Host with following information. PAYMENT_TYPE = A CSC_REASON_CODE = 01

**APPENDIX E –**

**CALIFORNIA TOLL  
OPERATORS COMMITTEE (CTOC)**

**FILE SPECIFICATION**

**\* NOTE: This document is included for reference only and will be finalized during implementation.**

## DOCUMENT CONTROL

Originator:	6C Toll Operators Coalition
Report Title:	6C Toll Operators coalition avi Transponder Programming Standard
History:	V 0.1 - Initial Draft Release
	V 0.2 – Updates to “State” portion of EPC field Hash Key changed from 16 to 32 bytes Version Code added to Transponder Serial Number Field
	V 0.3 – Existing System Compatibility section added
	V 0.4 – Transponder and Reader Technical Requirements section added
	V 0.5 – Move Technical Requirements Section
	V 0.6 – Update to Barcode format and EPC/Password validation calculation examples
	V 0.7 – Update to User Memory Password validation calculation example and addition of comment regarding HOT declaration in EPC field
	V 1.0 – Updated Agency Codes (E-470 changed from 1 to 2); Made the Barcode format optional; Prohibited Read protection of User Data Memory; Allowed optional Write protection of User Data Memory; Updated references to the TID length to allow use of all fully serialized ISO 18000-6C standard tags
	V 2.0 – Updated the name of the document; redesigned memory map; convert from EPC Global format to ISO format; security update; changes to permit declarable transponders; updated Barcode format
	V 3.0 - Fixed encoding details according to ISO requirements, giving more detail as needed. Combined State and Agency fields to be single Agency field and added Agency ID appendix. Clarified UII validation calculation.
	V 3.0 Revision 2 – Added logo to cover page; clarified barcode format; corrected sample calculation of UII Validation hashing value.
	V 3.0 Revision 3 – Added DSFID (0x3E) to be programmed as initial 2 bytes of UII.

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# 1. INTRODUCTION

## 1.1 Purpose

The purpose of this document is to create and maintain a transponder programming standard based on the ISO/IEC 18000-63 (known as 6C) communication protocol for tolling applications that use automatic vehicle identification (AVI). The guidance is intended for tag and reader

manufacturers, toll lane vendors, system integrators, back-office providers, and other members of the RFID industry.

This programming standard meets the interoperability requirements developed by IBTTA's Roadside Interoperability Group.

## 1.2 Scope

This document addresses the following areas of interest:

- Memory Mapping
- Barcode Format
- Transponder Security and Data Integrity Validation
- Transponder Ordering and Delivery (Manifest Information)
- Compatibility with Existing Systems

## 1.3 Definitions, Acronyms, and Abbreviations

<i>TID</i>	Transponder Identification Gen2 transponder memory bank 10
<i>UM</i>	User Memory Gen2 transponder memory bank 11
<i>UII</i>	ISO/IEC 18000-63 (formerly '6C'), transponder memory bank 01

## 2. MEMORY MAPPING

The ISO/IEC 18000-63 transponder memory is separated into four memory banks:

Bank 00	Reserved
Bank 10	TID
Bank 01	CRC, PC, UII
Bank 11	User Memory

### 2.1 Reserved Memory Specification

The Reserved memory shall be programmed by the tag provider and contents shared with the issuing agency.

### 2.2 TID Memory Specification

The Transponder Identification (**TID**) memory shall contain a minimum of 64 bits (8 byte) unalterable unique chip ID programmed by the chip manufacturer. This field will not be specified to be any particular value, but it is assumed to be unique for all -63 chips, per the ISO 18000-63 standard.

### 2.3 Memory Bank 01 Specification

There are three memory areas contained with Memory Bank 01.

- Stored CRC – This 16 bit long area is stored at memory location 00h - 0Fh and is calculated by the transponder.
- Stored PC - This area is 16 bits long and is stored at memory location 10h – 1Fh. The PC word contains the Application Family Identifier (AFI) – an 8 bit identifier (the value being 0xB0) assigned to the 6C Toll Operators Coalition. This number has been assigned for tolling by ISO, along with the Data Storage Format Identifier (DSFID, value of 0x3E) and explicitly describes a tag belonging to the 6C Toll Operators Coalition.

This number can be used to filter the responses of tags to ensure that only toll tags are being read.

The PC word is encoded during chip initialization and is dependent on the type of chip being encoded, not on an individual tag's data.

- UII – This area is at least 96 bits long and is stored beginning at memory location 20h. Any memory in excess of 96 bits is undefined and may be used by the issuing agency; however, the additional memory shall not interfere with any of the functionality contained in this document. The UII shall provide read-only access to users. The issuing agency may lock write access permanently or may allow write access by a password maintained by the issuing agency.

2.3.1 MEMORY MAP

Area	#	Memory Address	Section	Description	Values
Stored CRC	1-16	00h-0Fh (16 bits)	Calculated	Area is calculated based on other transponder memory values per ISO 18000-63 specification.	Varies
Stored PC	1-5	10h-14h (5 bits)	Length	Number of 16 bit words in the UII	00110 = 6 words (indicates 96 bit UII) – will vary based on UII length
	6	15h (1 bit)	User Memory	Indicates status of the User Memory	0 = no user memory 1 = user memory available
	7	16h (1 bit)	XPC	Indicates status of extended tag features	0 = no XPC 1 = XPC available
	8	17h (1 bit)	Numbering System Indicator	Indicates if the tag is coded as an EPC or ISO tag.	0 = EPC 1 = ISO (correct value for 6C TOC applications)
	9-16	18h-1Fh (8 bits)	AFI	Application Family Identifier for 6C TOC – B0	1011 0000 = 6C TOC AFI (B0)
UII	1-8	20h-27h (8 bits)	DSFID	Data Storage Format Identifier for 6C TOC – 0x3E	0011 1110 = 6C TOC DSFID (3E)
	9 - 21	28h–34h (13 bits)	Agency Use	Individual agencies may add agency specific information here.	Assigned by agency
	22-33	35h-40h  (1 bit)  (5 bits)	Classification  Class  Vehicle Type	Classification is taken directly from 2.2 E-ZPass – IAG, 256 Bit Style #1, Format #1 and includes:  The first bit indicates if the tag has been assigned a classification value. If 0 is selected, the following 11 bits shall be ignored.  This field indicates the type of vehicle.	  0 = no class value assigned (default) 1 = class value assigned  00000 = undefined (default) 00001 = automobile 00010 = motorcycle 00011 = pickup truck 00100 = van (seats 1-9) 00101 = minibus (seats 10-15) 00110 = bus (seats 16+) 00111 = recreational vehicle 01000 = truck 01001 = auto transporter (≤ 65') 01010 = auto transporter (>65') 01011 = tractor & trailer (≤48') 01100 = tractor & trailer (>48') 01101 = tractor & dual trailers each (≤28.5') 01110 = tractor & dual trailers each (>28.5')



6C TOLL OPERATORS COALITION

AVI TRANSPONDER PROGRAMMING

Area	#	Memory Address	Section	Description	Values
		(4 bits)	Vehicle Axles	This field indicates the number of axles.	01111 = tractor & dual trailers each (one ≤28.5' other >28.5') 10000 = undefined 10001 = tractor/mobile home combination 10010-11111 = undefined  0000 = undefined (default) 0001 = undefined 0010 = 2 axles 0011 = 3 axles 0100 = 4 axles 0101 = 5 axles 0110 = 6 axles 0111 = 7 axles 1000 = 8 axles 1001 = 9 axles 1010 = 10 axles 1011 = 11 axles 1100 = 12 axles 1101 = 13 axles 1110 = 14 axles 1111 = 15 axles
		(1bit)	Vehicle Weight	This field indicates the weight of vehicle.	0 = ≤ 7,000 lbs (default) 1 = > 7,000 lbs
		(1 bit)	Vehicle Rear Tires	This field indicates the number of rear tires.	0 = Single rear tires (default) 1 = Dual rear tires
	34-36	41h-43h (3 bits)	HOV Declaration	These three bits indicate the declaration status of the tag. All single mode transponders shall be assigned the default value – 000, unless they are carpool specific tags.	000 = single mode (default) 001 = SOV (non-carpool) 010 = HOV 2+ 011 = HOV 3+ 100 = Carpool (as defined by roadway) 101 = reserved for future use 110 = reserved for future use 111 = reserved for future use
	37-40	44h-47h (4 bits)	Version	There are 16 possible values to indicate the version of programming standard used on the tag.	0000 = unassigned 0001 = Ver. 1.0 0010 = Ver. 2.0 0011 = Ver. 3.0
	41-52	48h-53h (12 bits)	Agency	The Agency Code allows for up to 4,096 agencies. The known agencies are included in the values column. See Appendix A for details.	See Appendix A – Table of Agencies
	53-80	54h-6Fh (28 bits)	Transponder Serial Number	This identifies the particular tag within the agency. There are 268,435,456 values accommodated in this space. The values in this field will be assigned by each agency.	Assigned by agency

Area	#	Memory Address	Section	Description	Values
	81-96	70h-7Fh (16 bits)	UII Validation (Hash Value)	This is calculated using the first 80 UII bits and 32 byte key. Example is provided in Section 4.	Assigned at the time of transponder manufacturer. Calculated as per Section 4.

Table 1: UII Memory Mapping

## 2.4 User Memory Specification

As of the publication date of this Version 3.0, none of the current members of the 6C Toll Operators Coalition write to their tags, nor do any of them read the User memory. It is anticipated that this memory bank may be required to accommodate future group members or affiliates. The following general specifications shall apply.

The User memory shall have at least 512 bits (64 bytes) and shall NOT be read or write protected.

The User memory bank shall be designated as a temporary data field, where facilities may read and write whatever information is necessary, recognizing that the data may be overwritten at any time. For example, an agency operating a closed ticket type of system may choose to use this bank and write trip start date, time, location, and price as the trip begins and read this information at the conclusion of the trip. This could be used to compute the correct toll.

Any agency-specific use of User memory outside the specifications in this document should be closely coordinated to reduce the risk of future conflicts.

### DSFID – Data Storage Format Identifier

The DSFID declares the data format for the data in User Memory. It is a value set by ISO as part of the AFI process. ISO has assigned the value 0x3E, which means the data is defined by the 6C Toll Operators Coalition. The User Memory portion of the tag shall have the following format:

#	Memory Address	Section	Description	Values
1-8	00h-07h (8 bits)	DSFID	<ul style="list-style-type: none"> <li>Data Storage Format Identifier</li> </ul>	0011 1110 = 6C TOC DSFID (3E)
9-20	08h-23h (12 bits)	Agency	<ul style="list-style-type: none"> <li>12 bit <b>Agency Code</b>. As assigned in the previous section.</li> </ul>	Section 2.3.1
21-27	24h-1Ah (7 bits)	Plaza ID	<ul style="list-style-type: none"> <li>7 bit <b>Plaza ID</b>. Each operator may choose.</li> </ul>	To be defined by agencies using this field.
28-32	1Bh-1Fh (5 bits)	Lane ID	<ul style="list-style-type: none"> <li>5 bit <b>Lane ID</b>. Each operator may choose.</li> </ul>	To be defined by agencies using this field.
33-57	20h-38h (25 bits)	Day/Time	<ul style="list-style-type: none"> <li>25 bit <b>Day</b>. Each operator may choose. (seconds since Jan 01 00:00:00)</li> </ul>	To be defined by agencies using this field.
58—60	39h-3Bh (3 bits)	Occupancy Setting	<ul style="list-style-type: none"> <li>3 bit <b>Occupancy</b>. Each operator may choose.</li> </ul>	To be defined by agencies using this field.
61+	3Ch -	Undefined	<ul style="list-style-type: none"> <li>The remaining bits may be defined as individual agency needs arise.</li> </ul>	

Table 2: User Memory Mapping

### 3. BARCODE FORMAT

#### 3.1 Barcode Format

The transponder barcode includes only the Agency Code and the Transponder Serial Number along with a check digit. The barcode shall be printed using EPC Code 128 and the code data digits shall be in decimal format AAAATTTTTTTTTTL where AAAA is the Agency Code as a 4-digit number with leading zeros, TTTTTTTTTT is the Transponder Serial Number (TSN) as a 10-digit number with leading zeros and L is the Luhn check digit computed using only the last 2 digits of the Agency Code and all 10 digits of the TSN.

Below the barcode the Agency Code, the TSN and the check digit shall be displayed in the following decimal format <AA>AA TTTTTTTTTT L. The printed Agency Code shall NOT contain leading zeros and shall be separated from the TSN by a double space., where <AA>AA is the Agency code excluding leading zeros. The TSN shall include the leading zeros (to fill all 10 digits) and shall be separated from the check digit number L by a double space.

**<AA>AA TTTTTTTTTT L**

Where:

**<AA>AA** = 4 digit Agency Code (leading zeroes not printed)

**TTTTTTTTTT** = 10 digit Transponder Serial Number (leading zeroes printed)

**L** = Check digit Luhn (mod10) coded – calculated based upon **<AA>AA** (third and fourth digits only) and **TTTTTTTTTT** (all ten digits)

For example, a transponder with serial number 12 for agency 77 would return 00770000000123 as the barcode content and the printed information below the barcode would be

**77 000000012 3.**

Similarly for agency 449 a transponder with serial number 12 would return 04490000000122 as the barcode content and the printed information below the barcode would be

**449 000000012 2.**

## 4. SECURITY AND DATA INTEGRITY VALIDATION

### 4.1 Overview

Transponder security is critical to the toll industry. It is anticipated that as more security features become available they will be evaluated and deployed, as appropriate. The following security measures are currently employed.

#### 4.1.1 TID MEMORY BANK

The transponder identification number shall be uniquely assigned by the manufacturer. It shall be readable without a password, cannot be altered and must be unique.

#### 4.1.2 UII MEMORY BANK

1. Read Password – The UII memory shall be readable without a password and mapped according to the requirement table in Section 2.3.1.
2. Write Password – The UII memory shall be writable with a password. The issuing agency shall be the only entity authorized to change the encoded bits on the transponder. The password shall be known only to the issuing agency.
3. UII Authentication/Validation – The UII memory data shall be authenticated with two hashed validation bytes. The UII Validation bytes can be used for transponder data verification and can also provide some level of transponder authentication. Further details are contained in Section 4.2
4. Encryption – Under development.

#### 4.1.3 USER MEMORY BANK

1. Read Password – The User memory shall be readable without a password.
2. Write Password – The User memory shall be writable without a password.
3. Authentication/Validation – Authentication and validation shall not be used.
4. Encryption – Under development.



## 5. TRANSPONDER ORDERING AND DELIVERY (MANIFEST INFORMATION)

To facilitate loading of data in back office transponder inventory on transponder delivery, manufacturers should provide a file with comma separated UII memory and TID. Each transponder entry should be on a new line:

12\_Byte\_UII\_Memory,TID (length varies)

**0101CE00010000000101CE8C,E2003412012EC0FFEE041392<sup>2</sup>**

---

<sup>2</sup> Note: Values shown are for illustrative purposes only and are not actual/valid EPC or TID values. A 12 byte TID is used for example purposes.

## 6. COMPATABILITY WITH EXISTING DEPLOYMENTS

### 6.1 6C Toll Operators Coalition, Version 1.0

ISO 18000-6C Tolling AVI Transponder Programing Standard Version 1.0 was finalized in June 2012. Colorado's and British Columbia's TI Corp follow the standard. This standard is administered by the 6C Toll Operators Coalition. This standard is forward compatible with Version 2.0 and 3.0.

#### 6.1.1 E-470 TOLL AUTHORITY, USA

Colorado's E-470 follows this interoperable standard (1.0).

#### 6.1.2 TI CORP, CA

British Columbia's TI Corp follows this interoperable standard (1.0).

### 6.2 6C Toll Operators Coalition, Version 2.0

ISO 18000-63 Tolling AVI Transponder Programing Standard Version 2.0 was published in draft form in October 2014. This standard is administered by the 6C Toll Operators Coalition. This standard is compatible with Version 1.0 and 3.0.

#### 6.2.1 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, USA

Washington State Department of Transportation follows this interoperable version (2.0).

### 6.3 Legacy Systems

#### 6.3.1 STATE ROAD AND TOLLWAY AUTHORITY (SRTA), USA

Georgia's State Road and Tollway Authority (SRTA) had already deployed transponder programming requirements before Version 1.0 was developed and continue to operate their current legacy system.

#### 6.3.2 UTAH DEPARTMENT OF TRANSPORTATION, USA

Utah Department of Transportation had already deployed transponder programming requirements before Version 1.0 was developed and continue to operate their current legacy system.

#### 6.3.3 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, USA

Washington State Department of Transportation had already deployed transponder programming requirements before Version 1.0 was developed and continue to operate their current legacy system. This legacy standard is being phased out.



## 7. APPENDICES

### 7.1 Appendix A – Table of Agencies

Agency	Acronym	State	Status	Decimal	Hex	Binary
Reserved	N/A	N/A	Reserved	0	0	0000 0000 0000
Washington State Department of Transportation	WSDOT	WA	Assigned	77	4D	0000 0100 1101
Bay Area Toll Authority	BATA	CA	Assigned	101	65	0000 0110 0101
California Department of Transportation	CalTrans	CA	Assigned	102	66	0000 0110 0110
Foothill/Eastern Transportation Corridor Agency	FETCA	CA	Assigned	103	67	0000 0110 0111
San Joaquin Hills Transportation Corridor Agency	SJHTCA	CA	Assigned	104	68	0000 0110 1000
Golden Gate Bridge, Highway and Tunnel District	GGBHTD	CA	Assigned	105	69	0000 0110 1001
Los Angeles County Metropolitan Transportation Authority	LACMTA	CA	Assigned	106	6A	0000 0110 1010
Orange County Transportation Authority	OCTA	CA	Assigned	107	6B	0000 0110 1011
Riverside County Transportation Commission	RCTC	CA	Assigned	108	6C	0000 0110 1100
San Diego Association of Governments	SANDAG	CA	Assigned	109	6D	0000 0110 1101
Santa Clara Valley Transportation Authority	VTA	CA	Assigned	110	6E	0000 0110 1110
South Bay Expressway, LLC	SBX	CA	Assigned	111	6F	0000 0110 1111
Sunol SMART Carpool Lanes Joint Powers Authority	Sunol JPA	CA	Assigned	112	70	0000 0111 0000
San Francisco County Transportation Authority	SFCTA	CA	Assigned	113	71	0000 0111 0001
San Bernardino Associated Governments	SANBAG	CA	Assigned	114	72	0000 0111 0010
E-470	E-470	CO	Assigned	194	C2	0000 1100 0010
State Road & Toll Way Authority	SRTA	GA	Assigned	321	141	0001 0100 0001
Puerto Rico Highway and Transportation Authority	PRHTA	PR	Assigned	448	1C0	0001 1100 0000
Louisville-Southern Indiana Ohio River Bridges	LSIORB	KY	Assigned	449	1C1	0001 1100 0001
Louisiana Department of Transportation and Development	LADOTD	LA	Assigned	450	1C2	0001 1100 0010
Utah Department of Transportation	UDOT	UT	Reserved	1409	581	0101 1000 0001
Washington State Department of Transportation	WSDOT	WA	Reserved	1505	5E1	0101 1110 0001
Transportation Investment Corporation	TI Corp	BC	Assigned	2305	901	1001 0000 0001
Blue Water Bridge Authority	BWBA	ON	Assigned	2529	9E1	1001 1110 0001

Table A-1: Agency IDs



Dated: October 27, 2016

**ADDENDUM NO. 1**

**REQUEST FOR PROPOSALS (RFP) NO. 2017-B-04**  
**REPLACEMENT TOLL COLLECTION SYSTEM**

To All Prospective Proposers:

The Golden Gate Bridge, Highway and Transportation District (District) herewith issues Addendum No. 1 to the above-referenced solicitation. This Addendum is hereby incorporated and made part of the solicitation documents. Except as specifically modified by this document, all other terms and conditions remain in full force and effect.

**MODIFICATION TO APPENDIX CONTAINED IN SOLICITATION DOCUMENTS**

The following change has been made to the solicitation documents:

**APPENDIX A, REQUIREMENTS TRACEABILITY MATRIX**

Replaced with new version (Version 1).

**Proposers shall acknowledge the inclusion of this Addendum by inserting the Addendum number in the space provided on the Acknowledgment of Addenda of the solicitation documents. Failure to do so may cause the District to deem the proposal as being unresponsive.**

A handwritten signature in black ink that reads "Aida Caputo". The signature is written in a cursive style and is positioned above a horizontal line.

Aida Caputo  
Contracts Officer

**Proposer is to complete the following columns on the RTM worksheet:**

The RTM shall be completed by the Proposer for all requirements. The spreadsheet columns on the 'Requirements' tab are defined and shall be completed as follows:

<b>Column</b>	<b>Description</b>
Level	Corresponds to the Table of Contents level of the section/requirement
Requirement Number	Corresponds to the Requirement Number(s) for requirements listed
Requirement	The text of the requirement
Type	The requirement type
Proposer Acknowledges Requirement	For Proposal and Informational Requirements enter "Accepted" if Proposer accepts requirement and can meet it. Enter "Not Accepted" if Proposer does not accept requirement. If not accepted, Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not accept requirement must be entered in the Comments field. NOTE that a response of "Accepted" for Proposal requirements means requirement is addressed in Proposal.
Will be met in execution of SOW?	For Maintenance, Procedural and Performance Requirements enter "Yes" if the requirement will be met during the execution of the Scope of Work (SOW), enter "No" if the Proposer can not meet requirement. If "No" is selected, Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not meet requirement must be entered in the Comments field.
Fully Supported by Existing System ?	Enter "Yes" if the Proposed system for this project fully supports the requirement. Otherwise, enter "No". If "No" (or N/A) is selected the Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not meet requirement or why requirement is N/A, must be entered in the Comments field.

Comments	In the Comments column, enter a brief comment/ explanation addressing how the gap will be filled, or why the requirement will not be fully met.
Proposal Reference	Provide the reference(s) to the section(s) where the Proposal addresses the comment(s).

**Any requirement as set forth in the RFP that is not listed here is still required to be completed.**

MassDOT AET - 607579  
AETS System Requirements Traceability Matrix

Version 1

Requirement Number	Requirement	Requirement Type	Informational & Proposal Requirements	Maintenance, Procedural and Performance Requirements	Functional Requirements Only	Comments	Proposal Reference(s)
			Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?		
<b>2</b>	<b>PROJECT FRAMEWORK</b>						
<b>2.1</b>	<b>PROJECT MANAGEMENT</b>						
<b>2.1.1</b>	<b>Project Manager</b>						
2.1.1.1	The TSI shall provide a Project Manager approved by the District.	Procedural					
2.1.1.2	The TSI shall dedicate the Project Manager full-time to the Project.	Procedural					
2.1.1.3	The Project Manager shall have the authority to make decisions for the TSI and assign the necessary staff to fulfill Project requirements.	Procedural					
2.1.1.4	The Proposer shall include a job description, Bio, and resume for the proposed Project Manager.	Proposal					
<b>2.1.2</b>	<b>Gantry Coordinator</b>						
2.1.2.1	The TSI shall provide a Gantry Coordinator approved by the District.	Procedural					
2.1.2.2	The Gantry Coordinator shall have experience in open road tolling, Gantry equipment design, installation, safety, and AC power.	Procedural					
2.1.2.3	The Proposer shall include a job description, Bio, and resume for the proposed Gantry Coordinator.	Proposal					
<b>2.1.3</b>	<b>RCSC Coordinator</b>						
2.1.3.1	The TSI shall provide a RCSC Coordinator approved by the District.	Procedural					
2.1.3.2	The RCSC Coordinator shall have experience in all electronic tolling, back office toll account processing, file exchange, and file processing.	Procedural					
2.1.3.3	The RCSC Coordinator shall become intimately familiar with the RCSC ICD and the interface requirements.	Procedural					
2.1.3.4	The Proposer shall include a job description, Bio, and resume for the proposed RCSC Coordinator.	Proposal					
<b>2.1.4</b>	<b>Maintenance Manager</b>						
2.1.4.1	The TSI shall provide a Maintenance Manager approved by the District.	Procedural					
2.1.4.2	The Maintenance Manager shall have a minimum of 5 years' experience in the maintenance of toll systems.	Procedural					
2.1.4.3	The Maintenance Manager shall be the primary point of contact to the District during the entire Maintenance Phase.	Procedural					
2.1.4.4	The Maintenance Manager shall work directly with the implementation team to ensure an understanding of System design concepts.	Procedural					
2.1.4.5	The Proposer shall include a job description, Bio, and resume for the proposed Maintenance Manager.	Proposal					
<b>2.1.5</b>	<b>Project Meetings</b>						

MassDOT AET - 607579  
AETS System Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.1.5.1	The TSI shall attend a Project kick-off meeting at the District's offices within one week of receiving a notice to proceed. All TSI lead staff and representatives from TSI sub-contractors shall attend the Project kick-off meeting.	Procedural					
2.1.5.2	The TSI shall schedule Project Status meetings no less frequently than monthly during Phases 1, 2 and 3.	Procedural					
2.1.5.3	The TSI shall schedule Project Status meetings no less frequently than twice per month during Phases 4, 5 and 6.	Procedural					
2.1.5.4	The TSI shall plan on every other Project Status meeting being in-person at the District's offices.	Procedural					
2.1.5.5	The TSI shall publish an agenda for the Project Status meeting at least two (2) business days prior to the scheduled Project Status meeting.	Procedural					
2.1.5.6	The TSI shall publish a two-week look ahead to be included with the agenda for the Project Status meeting.	Procedural					
2.1.5.7	The TSI shall publish the latest action item list to be included with the agenda for the Project Status meeting.	Procedural					
2.1.5.8	The TSI shall capture minutes from all Project Status meetings and shall publish them within three (3) business days after the Project Status meeting.	Procedural					
2.1.5.9	The TSI shall maintain an action item list from the Project Status meetings and shall publish it with the minutes from the Project Status meeting.	Procedural					
2.1.5.10	The TSI shall attend any project related meetings scheduled by the District to which it is invited.	Procedural					
<b>2.1.6</b>	<b>Project Schedule Management</b>						
2.1.6.1	The Proposer shall submit a preliminary Project Schedule that provides for a fully functional System meeting all requirements in this Scope of Work. The Proposer's schedule shall be submitted with the proposal as instructed.	Proposal					
2.1.6.2	The TSI shall submit a detailed Project Schedule within 30 days after notice to proceed. The Project Schedule shall identify all tasks to be accomplished, task dependencies, and start date and duration for each task.	Procedural					
2.1.6.3	The Project Schedule shall include deliverable dates for all documents that will be submitted for District review and approval.	Procedural					
2.1.6.4	The Project Schedule shall provide the District with a 14 day review period for each TSI deliverable.	Procedural					
2.1.6.5	The Project Schedule shall show review and approval task start dates and duration.	Procedural					
2.1.6.6	The Project Schedule shall include all detailed steps that are required to accomplish the major Project Phases.	Procedural					

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2.1.6.7	The TSI shall include time for submittal, review and approval of all Project deliverables in the Project Schedule.	Procedural					
2.1.6.8	Throughout the Term of the Project, the TSI shall monitor, and update the Project Schedule whenever changes to the System of a material nature occur, or as directed by the District.	Procedural					
2.1.6.9	The required Project Schedule submittals shall be in Microsoft Project.	Procedural					
2.1.6.10	The TSI shall identify and promptly report to the District all Project Schedule and progress delays during the execution of the Project.	Procedural					
2.1.6.11	In the event of any Project Schedule delay, the TSI shall take appropriate action to develop a recovery schedule.	Procedural					
2.1.6.12	The TSI shall submit a recovery schedule within five (5) business days following the identification of a Project Schedule delay.	Procedural					
2.1.6.13	Recovery schedules shall not release the TSI from liability for a delayed schedule.	Procedural					
2.1.6.14	The TSI shall submit proposed changes to the Project Schedule together with the reason for the proposed changes for District approval as it becomes necessary to modify the Project Schedule.	Procedural					
2.1.6.15	Until the District approves in writing any Project Schedule revision, all Project Schedule submittals shall be tracked against the previously approved Current Project Schedule.	Procedural					
2.1.6.16	If the District approves the revised Project Schedule, it shall become the Project Schedule of record, referred to as the Current Project Schedule in the Contract. Approved schedule changes do not release the TSI from the original requirements and Contract Deadlines unless explicitly agreed to in writing by the District.	Procedural					
2.1.6.17	The TSI shall create a revised Project Schedule, based on approval of a proposed Project Schedule change, and it shall be used as the basis for the subsequent monthly Project Schedule updates and reports.	Procedural					
<b>2.1.7</b>	<b>Quality Control Requirements</b>						
2.1.7.1	The Proposer shall submit a description of how it will assure quality during all Phases of the Project. The description shall include a definition of its quality organization and processes used.	Proposal					
2.1.7.2	The TSI, in the Proposal, shall submit a Quality Management Plan (QMP) that describes Quality Assurance (QA) and Quality Control (QC) procedures for preparing, verifying and checking all products and performance criteria related to this Project to ensure that they are independently checked and back-checked in accordance with generally accepted practices for these types of services and the requirements of this Scope of Work.	Proposal					
2.1.7.3	The QMP shall describe specific QC and QA procedures, including sample forms and checklists.	Proposal					

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<b>2.1.8</b>	<b>Deliverables</b>						
2.1.8.1	The TSI shall submit all deliverables per Appendix B and Section 10	Procedural					
<b>2.1.9</b>	<b>Requirement Traceability Matrix (RTM)</b>						
2.1.9.1	The Proposer shall complete the RTM found in Appendix A in accordance with the attached instructions.	Procedural					
2.1.9.2	In completing the RTM, the Proposer shall take the opportunity to indicate any differences to the requirements or advantages to alternate solutions.	Procedural					
2.1.9.3	The RTM submitted with the Proposal will not be included in the scoring of Proposals. However, the TSI may be asked to clarify certain items during the interviews, if selected.	Informational					
<b>2.2</b>	<b>PROJECT PHASES</b>						
<b>2.2.1</b>	<b>Phase 1 - Business Rules and System Requirements Definition</b>						
2.2.1.1	The TSI shall facilitate Business Rules and System requirements refinement workshops to review, discuss, refine and finalize the Business Rules and System requirements. These workshops shall include discussion of all functional areas and critical areas.	Procedural					
2.2.1.2	During these workshops, the TSI shall convey a full understanding of the intent of the System functions and Business Rules.	Procedural					
2.2.1.3	During these workshops, the TSI shall discuss how the System shall meet the requirements.	Procedural					
2.2.1.4	The TSI shall obtain written District approvals for any proposed changes resulting from the requirements definition workshops.	Procedural					
2.2.1.5	The TSI shall submit a revised RTM including the results of the workshop to the District for review and approval after the requirements workshops.	Procedural					
2.2.1.6	The TSI shall develop and deliver a Gantry Requirement Plan (GRP) over the period of the Phase 1 workshops.	Procedural					
2.2.1.7	The RTM shall be maintained and updated by the TSI through System Acceptance.	Procedural					
2.2.1.8	The RTM shall be updated at each Project Phase to identify each requirement, where it is addressed in the SDD, and which test procedure(s) are used to verify the requirement.	Procedural					
2.2.1.9	RTM updates that trace requirements to the SDD shall be submitted with each SDD submittal.	Procedural					
2.2.1.10	The TSI shall complete, and the District shall approve, the GRP and the initial version of the RTM as a condition of completing the Business Rules and System Requirements Definition Phase and progressing to the System Design Phase.	Informational					
<b>2.2.2</b>	<b>Phase 2 - System Design</b>						



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2.2.2.1	The TSI shall appoint an RCSC Coordinator to manage the CSC integration process and testing and serve as a single point of contact to the interested stakeholders (i.e., BATA, the RCSC vendor, and the District).	Procedural					
2.2.2.2	The TSI shall, in coordination with the stakeholders, shall ensure that the System design will support all aspects of the current RCSC ICD.	Procedural					
2.2.2.3	The TSI shall conduct the RCSC ICD discussions in parallel with the Lane and Host design activities.	Procedural					
2.2.2.5	District approval of the SDD including detailed Gantry equipment and conduit locations and an RCSC ICD checklist shall be required to complete the Design Phase.	Informational					
<b>2.2.3</b>	<b>Phase 3 - System Development</b>						
2.2.3.1	The TSI shall establish a location where developed hardware and software can be demonstrated, tested and verified.	Procedural					
2.2.3.2	The TSI shall schedule and conduct informal functional demonstrations throughout the System Development Phase to provide the District insight into the development progress and an opportunity to provide feedback during development.	Procedural					
2.2.3.3	The TSI shall set-up, conduct, and document the results of demonstrations including, but not limited to: <ul style="list-style-type: none"> <li>• Alert monitoring screens</li> <li>• System monitoring screens</li> <li>• Reporting Screens</li> <li>• RCSC Interface</li> <li>• Transaction files (Lane and Host) including reconciliation</li> <li>• Transaction research</li> <li>• Reference tables (toll amount, users, carpool hours, etc.)</li> <li>• Transaction flow from Lane to RCSC interface</li> <li>• ORT Lane operation including AVC and AVI correlation</li> </ul>	Procedural					
2.2.3.4	The District may request additional functional demonstrations to be witnessed at TSI facilities at any time.	Procedural					
2.2.3.5	The TSI shall be required to follow focused and methodical planning and execution as the RCSC is in operation with the public. It is essential that test data not co-mingle or interfere with live accounts. It is also essential that sufficient data and scenarios be tested prior to the go-live date.	Procedural					
2.2.3.6	The TSI shall develop a FAT plan for approval by the District.	Procedural					
2.2.3.7	The TSI shall implement the FAT as defined in Section 10.3.1 during this Phase	Procedural					
2.2.3.8	The TSI shall develop a CSC Integration Test (CIT) plan for approval by the District.	Procedural					

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2.2.3.9	The TSI shall implement the CIT as defined in Section 10.3.2 during this Phase	Procedural					
2.2.3.10	The completion of Phase 3 shall be the successful completion and approval of the FAT and CIT.	Informational					
<b>2.2.4</b>	<b>Phase 4 - Installation</b>						
2.2.4.1	The TSI shall prepare and submit a detailed Installation Plan 60 days prior to the start of installation as defined in Section 10.2.1.	Procedural					
2.2.4.2	The TSI shall maintain a punch list during installation for review with the District Project Manager on a weekly basis.	Procedural					
2.2.4.3	The District, Caltrans and/or their designee shall have access and time to inspect all aspects of installation.	Procedural					
2.2.4.4	Installation activities shall not begin until all necessary plans, drawings, and documents are submitted and approved by the District.	Procedural					
2.2.4.5	The TSI shall ensure that the System is installed pursuant to the approved SDD and Installation Plan.	Procedural					
2.2.4.6	All installation and testing of communications equipment and wiring shall be done in a neat and professional manner by qualified network technicians.	Procedural					
2.2.4.7	The TSI shall be responsible for conducting routine inspections of all installations and certifying in writing that the Gantry Contractor has completed installation per the approved design documentation and drawings.	Procedural					
2.2.4.8	As-built drawings shall be submitted within thirty (30) days of the completion of the installation.	Functional					
2.2.4.9	The completion of Phase 4 shall be the successful completion of the Gantry Equipment Field Test (GEFT).	Informational					
<b>2.2.5</b>	<b>Phase 5 - Transition</b>						
2.2.5.1	The TSI shall prepare and submit a detailed Transition Plan 30 days prior to the start of transition as described in Section 10.2.2.	Procedural					
2.2.5.2	The TSI shall conduct training in the areas of operations, database system, and maintenance during the Transition Phase.	Procedural					
2.2.5.3	Training shall be provided by professional, qualified trainers supported by appropriate technical experts.	Procedural					
2.2.5.4	The TSI shall utilize the System User Manual for training on all interactive screens and functions used by the operators of the System.	Procedural					
2.2.5.5	Training shall be conducted using the actual new System with live traffic data.	Procedural					

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2.2.5.6	The TSI training shall cover all System functions items including: <ul style="list-style-type: none"> <li>• Dashboard (if applicable)</li> <li>• Reports</li> <li>• Video Monitor</li> <li>• Transaction Monitor</li> <li>• Transaction Research</li> <li>• DVAS Operation</li> <li>• User Rights Management</li> <li>• Toll Schedule Management</li> <li>• Carpool Hours</li> <li>• Holiday Calendar</li> </ul>	Procedural					
2.2.5.7	The TSI shall schedule three sessions for Operations training and determine with the District who should attend each session and the appropriate items to be covered.	Procedural					
2.2.5.8	Training shall be conducted at District offices with web conferencing available.	Procedural					
2.2.5.9	The TSI shall use the Host database documentation to train District designated individuals on the structure and meaning of all database tables and fields.	Procedural					
2.2.5.10	The TSI shall conduct database training during the Transition Phase.	Procedural					
2.2.5.11	The TSI shall indicate the minimum qualifications and database experience required to attend the class.	Procedural					
2.2.5.12	The TSI shall conduct database training using an exact duplicate of the actual Host database populated with real data collected during the Transition Phase.	Procedural					
2.2.5.13	The TSI shall conduct one database training course which is at a minimum of 24 hours of training delivered over one week and shall accommodate up to five people appointed by the District.	Procedural					
2.2.5.14	The TSI shall conduct database training at District offices with web conferencing available.	Procedural					
2.2.5.15	The TSI shall ensure that all class participants are able to generate queries, generate reports, as requested by the District and add/remove these reports from the System.	Procedural					
2.2.5.16	The TSI database trainer(s) shall be available through System acceptance to answer questions from the class attendees.	Procedural					
2.2.5.17	The TSI shall use the Maintenance Manual and as-built drawings to instruct District personnel in the physical design of the System, Alerts, and monitoring and repair coordination.	Procedural					
2.2.5.18	The TSI shall conduct two Maintenance training courses, which are a minimum of 24 hours each and delivered over one week and shall accommodate up to eight people appointed by the District in each course.	Procedural					

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2.2.5.19	The TSI maintenance training shall cover at a minimum: <ul style="list-style-type: none"> <li>• Changeable components</li> <li>• Electrical and communication requirements</li> <li>• Network</li> <li>• Alerts</li> <li>• Spares and support tools</li> <li>• Third-party agreements and licenses</li> <li>• TSI/GGB responsibilities and interaction</li> </ul>	Procedural					
2.2.5.20	TSI subject matter experts (SME's) shall be available through the maintenance period to answer questions from the District.	Procedural					
2.2.5.21	Training shall be conducted at District offices with web conferencing available.	Procedural					
2.2.5.22	The TSI shall develop a schedule and plan to test the System production readiness as described in Section 10.3.4.	Procedural					
2.2.5.23	The TSI shall pass the Production Readiness Test when all System functions have been tested and verified for correct operation with live traffic. Reasonable assurance that performance requirements will be met is also required as condition of passing the PRT.	Procedural					
2.2.5.24	The TSI shall develop a Cutover Plan (see Section 10.2.5 to ensure a seamless transition from the current system to the System at one point in time.	Procedural					
2.2.5.25	The TSI Cutover Plan shall ensure that the RCSC data exchange is in accordance with the accepted RCSC ICD.	Procedural					
2.2.5.26	The completion of Phase 5 shall be the successful completion all training, verification of Lane level performance requirements, completion of testing requirements, and transition to live operations.	Informational					
<b>2.2.6</b>	<b>Phase 6 - System Acceptance</b>						
2.2.6.1	The TSI shall begin the System Acceptance Test concurrently with the maintenance period upon the transition to the System to live operations	Procedural					
2.2.6.2	The TSI shall conduct the System Test Phase in accordance with the System Acceptance Test Plan as described in Section 10.3.5.	Procedural					
2.2.6.3	The TSI shall complete the System Acceptance Phase by passing the System Acceptance Test.	Informational					
<b>2.3</b>	<b>DOCUMENTATION REQUIREMENTS</b>						
<b>2.3.1</b>	<b>General System Document Requirements</b>						
2.3.1.1	The TSI shall be responsible for documentation of all Project activities.	Procedural					

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2.3.1.2	Manuals and other System documentation shall be developed using a currently supported version of Microsoft Word. Charts and figures created in other Microsoft products (Excel, Visio, etc.) shall be embedded into the documents.	Procedural					
2.3.1.3	All graphs, charts, illustrations, etc. shall be produced with the aid of Computer Aided Drafting (CAD) software or other software approved by the District (e.g. Microsoft Visio).	Procedural					
2.3.1.4	Site drawings, including wiring diagrams, electrical drawings, control box equipment diagrams, as-built conduit runs and other civil work, shall be supplied by the TSI in AUTOCAD format without restrictions to use by the District.	Procedural					
2.3.1.5	Project Schedules shall be developed in Microsoft Project.	Procedural					
2.3.1.6	Draft deliverables shall be submitted electronically via e-mail or in a shared repository as approved by the District.	Procedural					
2.3.1.7	Final deliverables/documents shall be submitted electronically in the format they were developed in as well as in PDF format, by email or in a shared repository with no read/write restrictions. An agreed to number of hard copies shall be submitted.	Procedural					
2.3.1.8	External references to files and figures shall be avoided.	Procedural					
2.3.1.9	Final versions of design documents and manuals shall be delivered as bound documents or in three ring binders to facilitate review and use of the documents.	Procedural					
2.3.1.10	The left-hand margin of the sheets in the manuals shall be adequate to ensure binding without encumbering the reading of the material.	Procedural					
2.3.1.11	Each document shall contain a title sheet, table of contents, revision log , list of figures (if applicable), list of tables (if applicable), list of reference drawings (if applicable).	Procedural					
2.3.1.12	With the exception of the original equipment manufacturer (OEM) standard documentation (e.g., manuals, catalogs), all manuals, section numbers, line numbers, page numbers, version numbers, records, and lists shall be printed on 8-1/2" by 11" sheets. Documents may include 11" by 17" foldouts.	Procedural					
2.3.1.13	Terminology used shall be consistent across documents (i.e. SDD, bill of materials, drawings) for readers to easily cross reference.	Procedural					
2.3.1.14	The TSI shall be responsible for updating Project documents during the life of the Project.	Procedural					
<b>2.3.2</b>	<b>System Document Review Process</b>						
2.3.2.1	All written deliverables shall be submitted by the TSI, in draft form for the District to comment and the TSI shall incorporate all comments as a part of their final submittal.	Procedural					

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2.3.2.2	The District shall be given 14 days to review and provide comments on all deliverables. If the deliverable is not accepted by the District the TSI shall resubmit with corrections and the District will again have 14 days to review and comment. This process will continue until the Deliverable is accepted.	Procedural					
2.3.2.3	An additional 10 days shall be scheduled by the TSI for documents requiring Caltrans review.	Procedural					
2.3.2.4	The TSI shall submit an empty comments matrix form with each document. The District will enter its comments into the matrix and the TSI shall track its resolution for every comment in the matrix.	Procedural					
2.3.2.5	The TSI shall submit additional iterations of drafts, if necessary, to fully resolve comments.	Procedural					
2.3.2.6	The TSI shall comply to the review process for all required documents including the various stages of the SDD development.	Procedural					
<b>2.3.3</b>	<b>Document Library</b>						
2.3.3.1	The TSI shall maintain a library of all current versions of all documents (including drawings) developed, received, or acquired for or by this Project.	Procedural					
2.3.3.2	The TSI shall maintain this library in a secure location with web access by all approved members of the Project team.	Procedural					
2.3.3.3	All Project-related electronic files shall be fully backed up weekly.	Procedural					
2.3.3.4	The TSI shall maintain a shared document log to apprised of status and versions of documents in the document library.	Procedural					
<b>2.4</b>	<b>TESTING REQUIREMENTS</b>						
<b>2.4.1</b>	<b>General Testing Requirements</b>						
2.4.1.1	The TSI shall be responsible for the preparation of a test plan and test scripts for all tests throughout all Phases of the Project. All test plans and test scripts are subject to District approval.	Procedural					
2.4.1.2	The TSI shall be responsible for conducting all tests throughout all Phases of the Project.	Procedural					
2.4.1.3	The TSI shall be responsible for the collection, processing and presentation of all test data necessary to demonstrate that the test has executed successfully.	Procedural					
2.4.1.4	The District and/or its authorized representatives shall witness and participate in all aspects of testing.	Procedural					
2.4.1.5	Testing shall include simulating error conditions and/or legitimate toll conditions, including those generated by users, as well as System issues and the ability of the System to recover and/or operate in a degraded or less than 100% capacity mode.	Procedural					
2.4.1.6	Back-up, archive, and restoration of data and System software shall be tested and verified.	Procedural					

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2.4.1.7	The TSI shall provide all required documentation, logistics, test sites, vehicles, and execution and management of tests as prescribed herein.	Procedural					
2.4.1.8	The TSI shall be responsible for all personnel, equipment and expenses associated with the testing program.	Procedural					
2.4.1.9	Successful completion of all repairs or modifications required to comply with the tests in this document shall be performed by the TSI without additional cost to the District.	Procedural					
2.4.1.10	If a failure pattern develops during performance of testing, the District may direct that testing be stopped and that design and/or implementation modifications be made. The TSI shall analyze and categorize all defects as to whether they are limited to the specific unit or software module being tested or are potential problems for all units. In the case of defects common to multiple units, all deliverable units shall be replaced or modified without additional cost to the District. This replacement or modification includes design changes, which shall be required to pass a design review by the District.	Procedural					
2.4.1.11	Detailed testing of the reporting application shall include unit test of each Report to ensure the accuracy, consistency and completeness of data recorded.	Procedural					
2.4.1.12	The TSI shall include test data sufficient in size and variety of types to fully test all of the Lane and Host requirements.	Procedural					
2.4.1.13	The District reserves the right to independently check on any quality control or quality assurance tests of the System.	Procedural					
<b>2.4.2</b>	<b>Test Plans</b>						
2.4.2.1	The TSI shall prepare and deliver a Test Plan outline for each Test Plan 60 days prior to the scheduled start of testing activity.	Procedural					
2.4.2.2	The TSI shall prepare and deliver a comprehensive Test Plan for each of the following Test Stages no less than 30 days prior to the start of testing: FAT, CIT, GEFT, PRT, and SAT.	Procedural					
2.4.2.3	Test Plans shall contain a summary statement of the purpose, description of the overall test site and environment, details of the installation as appropriate, features to be tested, and formatted test scripts.	Procedural					
2.4.2.4	Test Plans shall include specification of the hardware and software required for the test which describes the number and type of devices to be used along with block diagrams of all equipment and components used in the test configuration.	Procedural					

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2.4.2.5	Test Plans shall provide detailed descriptions of any differences and/or substitutions between hardware and software being used for testing versus what was originally proposed, approved, and/or what will be used in production.	Procedural					
2.4.2.6	Test Plans shall include detailed test scripts which: <ul style="list-style-type: none"> <li>• Demonstrate that every feature and function to be provided in the furnished hardware and software conforms to the Requirements Tracability Matrix;</li> <li>• Identify the feature or function to be demonstrated as part of each test script through specific references to both the RTM and the design documents;</li> <li>• Identify the steps for each test to be performed, test purpose, conditions which shall exist at the start of the test, and conditions/results expected at the conclusion of each step of the test;</li> <li>• Identify the success/failure status of each test along with adequate space for comments from the test witnesses;</li> <li>• Describe the outputs to be provided to the District to document the test results (e.g. reports, database listings, statistical analyses, message displays)</li> </ul>	Procedural					
2.4.2.7	The TSI shall provide a schedule for execution of the Test Plans. Each Test Plan should include an agenda, schedule of events and expected duration of the test.	Procedural					
2.4.2.8	The Test Plan shall describe what and how real-world inputs and outputs shall be simulated, if necessary to model field conditions or external interfaces. The use of simulator data shall be pre-approved by the District.	Procedural					
2.4.2.9	The TSI shall provide all associated test documentation, including, at a minimum, test procedures, scripts, checklists, test forms, and data summary sheets, along with the Test Plans as defined herein.	Procedural					
<b>2.4.3</b>	<b>Test Report and Analysis</b>						
2.4.3.1	The TSI shall prepare and deliver a Test Report within 10 business days following the end of each test.	Procedural					
2.4.3.2	The Test Report shall contain a summary, the test conditions at start and end of each scripted test, copies of the completed test script forms, analysis of the results, and an itemized list (punch list) of unresolved items that	Procedural					
2.4.3.3	If all scripted tests have passed, the report shall include a written statement or certification, from the TSI, that the System has successfully passed that specific test.	Procedural					



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2.4.3.4	If all scripted tests are not passed successfully, the report shall include a punch list detailing all failed tests or where results differed from expected and an action plan to correct the deficiencies and conduct a retest of the failed script.	Procedural					
2.4.3.5	The District will review and evaluate each Test Report, including the action plan, if required, and notify the TSI of its evaluation. The TSI shall rework the Test Report and action plan to the District's satisfaction.	Procedural					
2.4.3.6	The TSI shall record the actual outcome of each test, which shall be compared with the expected outcome. Test Reports shall include System screens and/or reports to document success or failure of tests. Failure to	Procedural					
2.4.3.7	Any failed test shall be considered a defect, and the associated hardware/software, equipment, and/or subsystems shall be rejected by the District and subject to submittal for approval for a retest.	Procedural					
2.4.3.8	The TSI shall execute the action plan for correcting deficiencies and perform the required retesting after which another Test Report shall be provided by the TSI and this process shall repeat as necessary until the test is completed successfully or until the District provides authorization to proceed to the next stage of testing.	Procedural					
2.4.3.9	Prior to a retest, the TSI shall prepare a report to be submitted to the District describing the root cause of the failure, the corrective action taken, and a request for retest.	Procedural					
2.4.3.10	The TSI shall indicate in its Test Report any equipment that has been damaged or is shown to be non-compliant with the approved design. The TSI shall be responsible to replace the deficient equipment at its own expense.	Procedural					
2.4.3.11	Acceptance of the Test Report and test results by the District shall not relieve the TSI of the responsibility for the installed System to meet the requirements of the Contract.	Procedural					
<b>2.4.4</b>	<b>Implementation Responsibilities</b>						
2.4.4.1	The TSI shall work with other entities as defined in subsequent sections to establish Gantry design requirements and supervise Gantry equipment installation.	Informational					
2.4.4.2	The District will be responsible for providing power and communication feeds to the Gantry system.	Informational					
2.4.4.3	The TSI shall work with the District and the Gantry designer (Section 4) to define the placement and terminations of the power and communication lines.	Informational					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.4.4.4	The TSI shall work with the Gantry Contractor (Section 4) to supervise proper installation of the power and communication lines.	Informational					
2.4.4.5	The TSI shall install all Host (Section 7.1) related equipment in District specified locations.	Informational					
2.4.4.6	The TSI shall provide interconnection of Host components in the same location.	Informational					
2.4.4.7	The TSI shall connect power to the Host components from District specified outlets.	Informational					
2.4.4.8	The District will provide and run all power and communication lines.	Informational					
2.4.4.9	The Gantry Designer and Gantry Contractor will be responsible for the physical design and installation the entire Gantry System.	Informational					
2.4.4.10	The TSI shall provide all equipment, cabinets, and housings required to support the Lane system.	Informational					
<b>3</b>	<b>GENERAL REQUIREMENTS</b>						
<b>3.2</b>	<b>SYSTEM METRICS</b>						
<b>3.2.1</b>	<b>Current Volumes</b>						
3.2.1.1	The current system has the following average southbound volumes: <ul style="list-style-type: none"> <li>• Average traffic is 55522 per day</li> <li>• Peak weekday hourly traffic average is 5240 vehicles/hour</li> <li>• Average rate of valid tagged transactions is 57%, and ranges from 45% to 75% of total hourly traffic</li> </ul>	Informational					
<b>3.2.2</b>	<b>System Life</b>						
3.2.2.1	The System shall be designed, developed and furnished to support a System life of no less than 10 years from Go-Live.	Functional					
<b>3.2.3</b>	<b>System Capacity</b>						
3.2.3.1	The System shall support the following: <ul style="list-style-type: none"> <li>• A peak of 2,200 vehicles per hour, per Lane</li> <li>• A maximum of 100,000 vehicles per day</li> <li>• 5% per year total traffic growth over the next ten years</li> <li>• A steady state AVI market share of 85% of Transactions per day</li> <li>• Transponder status storage for 100 million transponders</li> </ul>	Functional					
<b>3.3</b>	<b>CODES, STANDARDS, AND SPECIFICATIONS</b>						
<b>3.3.1</b>	<b>Construction Codes</b>						
3.3.1.1	All design and construction shall conform to Codes, Standards and Specification relevant to public works for Highways and Bridges, including AASHTO and California Department of Transportation (Caltrans) standards and requirements.	Informational					

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3.3.1.2	All communications, power, wiring, cables, enclosures, and other electrical equipment in hazardous locations shall conform to the latest version of the National Electrical Code, as well as any state or local codes and regulations.	Informational					
3.3.1.3	The TSI shall abide by current California Occupational Safety and Health Administration (OSHA) standards when designing, installing and maintaining equipment.	Informational					
3.3.1.4	The System shall comply with the pronouncements from the Financial Accounting Standards Board's (FASB), Government Accounting Standards Board (GASB), and generally accepted accounting principles (GAAP) for government financial accounting and reporting. A complete copy of the Governmental Accounting and Financial Standards may be ordered through <a href="http://www.gasb.org">www.gasb.org</a> .	Informational					
3.3.1.5	The TSI shall, where appropriate, utilize the services of fully qualified engineers for the purpose of performing all engineering civil, structural, electrical, mechanical, and architectural design and the preparation of related plans and documentation under this Project. All engineering civil, electrical, and mechanical design work related to the TSI scope shall be performed under the direct supervision of an engineer of the appropriate discipline licensed in the state of California or an architect licensed in the state of California.	Informational					
3.3.1.6	Electrical work shall be performed by California-licensed electricians. All electrical work shall be performed in accordance with the applicable regulations.	Informational					
3.3.1.7	Where applicable the following codes shall apply: <ul style="list-style-type: none"> <li>• State of California Department of Transportation Standard Specifications</li> <li>• State of California Department of Transportation Standard Plans</li> <li>• National Electric Code</li> <li>• National Electrical Contractors Association (NECA)</li> <li>• National Fire Protection Association (NFPA)</li> <li>• National Electrical Manufacturers Association (NEMA)</li> <li>• Institute of Electrical and Electronic Engineers (IEEE)</li> <li>• Applicable Electronic Industries Association (EIA) Standards for Interface and Intercommunication</li> <li>• Underwriters Laboratories (UL)</li> </ul>	Informational					
<b>3.3.2</b>	<b>Regulation and Highway Codes</b>						
3.3.2.1	The System shall permit full compliance with Sections 27564 and 27565 of the California Streets and Highways Code.	Informational					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.3.2.2	The System shall be compliant with California Vehicle Code Section 40250 et seq, which addresses the procedures for the enforcement of toll evasion laws using electronic surveillance, image capture equipment and the California DMV to obtain the name and address of the registered owner of a vehicle that has not paid the required toll.	Informational					
3.3.2.3	The System shall be fully compliant with Sections 21655.5 (A) through 21655.5 (B) of the California Vehicles Code. These code sections address the high-occupancy lane requirements and limitations of using these lanes.	Informational					
<b>3.3.3</b>	<b>CTOC Technical Specifications</b>						
3.3.3.1	The California Toll Operators Committee (CTOC) has defined the specifications for transferring files between California toll collection agencies (interoperability). The Regional Customer Service Center (RCSC) is directly responsible for such transfers.	Informational					
3.3.3.2	The TSI shall ensure that all data necessary for successful file transfers under the CTOC Technical Specifications for Interagency Electronic Data, as of October 2016, Revision 5G is provided by the System.	Functional					
3.3.3.3	The TSI shall make all necessary System changes that are required during the Contract term to comply with the revisions to the CTOC Technical Specification, including policies and procedures changes and the addition of new member facilities.	Functional					
3.3.3.4	The current CTOC technical specifications can be found in Appendix E.	Informational					
<b>3.3.4</b>	<b>FCC License</b>						
3.3.4.1	The System shall comply with all applicable Federal Communications Commission (FCC) regulations. On behalf of the District, the TSI shall ensure that the applicable licenses are currently in place or apply for and obtain the necessary FCC licenses for all the AVI equipment installed under this Contract.	Functional					
<b>3.4</b>	<b>GENERIC REQUIREMENTS</b>						
<b>3.4.1</b>	<b>Physical Environment</b>						
3.4.1.1	The TSI shall be responsible for assessing the Toll Zone's unique environment and designing the System to meet performance requirements under those conditions. Weather conditions shall not be a reason for failure to meet performance requirements.	Functional					
3.4.1.2	The System shall be designed to operate without performance degradation in the Golden Gate Bridge's humid, corrosive, and foggy marine-adjacent environment as well as in other typical weather conditions experienced at the Golden Gate Bridge including, but not limited to, bright sunlight, rain, and wind.	Functional					

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3.4.1.3	The System shall maintain the required performance levels while taking into consideration the possible conditions of Golden Gate Bridge roadway including, but not limited to, oil, standing water or other degraded roadway conditions.	Functional					
3.4.1.4	All equipment supplied by the TSI shall operate in the electromagnetic environment present at the Golden Gate Bridge without any errors or degradations due to Electromagnetic Interference (EMI) or interference to the surrounding environment.	Functional					
3.4.1.5	Lane equipment and enclosures shall be protected from corrosion, especially electrical connectors which must be removed and reconnected during preventive or corrective maintenance.	Functional					
<b>3.4.2</b>	<b>Cabinets and Enclosures</b>						
3.4.2.1	In cases where equipment must be mounted on or near the Gantry, roadside cabinets required to house such equipment shall adhere to applicable District electrical standards.	Functional					
3.4.2.2	All roadside electronic components shall be enclosed in outdoor, watertight, NEMA 4X cabinets or housings with an IP rating of 66 or better.	Functional					
3.4.2.3	All cabinets, housings, mounting hardware and fasteners shall be stainless steel or marine grade aluminum whenever practical.	Functional					
3.4.2.4	All conduit, Tees, and couplings shall be the epoxy coated type such as Ocal or Rob Roy.	Functional					
3.4.2.5	Door frame openings shall be flanged on all four sides to prevent ingress of liquid and dust when door is opened.	Functional					
3.4.2.6	Exterior cabinets shall have no exterior seams.	Functional					
3.4.2.7	Large cabinets shall include a switch and light to illuminate the contents of the cabinet.	Functional					
3.4.2.8	All cabinet chambers shall be electrically grounded. All cabinet doors shall be equipped with ground straps.	Functional					
3.4.2.9	All electrical outlets installed in cabinets shall be duplex ground fault receptacles.	Functional					
3.4.2.10	All cabinets shall be approved by the District.	Functional					
<b>3.4.3</b>	<b>Equipment Requirements</b>						
3.4.3.1	The System shall utilize new, commercial off-the-shelf (COTS), field-proven equipment and communication cables. Use of custom, non-COTS equipment shall require District approval.	Functional					
3.4.3.2	The System shall have modular, replaceable and repairable parts.	Functional					
3.4.3.3	Parts which serve the same function shall be interchangeable.	Functional					
3.4.3.4	All hardware and software shall have a minimum service life that extends through the life of the System.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.4.3.5	All roadside components shall be rated to operate in a temperature range of minus 5 degrees Celsius to plus 60 degrees Celsius with no degradation in performance.	Functional					
3.4.3.6	All roadside components shall be rated to operate in a relative humidity range of 5% to 100% for equipment installed in an outside environment and 5% to 95% non-condensing humidity for equipment installed inside cabinets and equipment racks.	Functional					
3.4.3.7	All mounting bolts shall be assembled using "Never-Seize" or other corrosion resistant product.	Functional					
3.4.3.8	All field wiring shall be terminated with standard COTS connectors, rated for outdoor installation and self-locking to prevent accidental disconnection.	Functional					
3.4.3.9	All wiring and cabling, including copper data and power cables, shall be neatly labeled, bundled, tie-wrapped, and secured. Wire labels shall be plastic permanent-type labels. All wiring and cable labels shall match annotations on as-built drawings	Functional					
3.4.3.10	All field wiring shall be secured with strain relief, and provided with sufficient slack so as not to interfere with adjustment, repositioning, or replacement of hardware.	Functional					
3.4.3.11	The TSI shall label everything installed as a part of the System including but not limited to equipment, cables, and conduit. The District shall have final approval of such labeling. The labeling shall enable efficient maintenance and inventory.	Functional					
3.4.3.12	All equipment shall be installed, configured and tested in strict accordance with the original manufacturer's instructions. The manufacturer's printed or verbal recommended installation procedures and instructions for all materials furnished by the TSI under this Contract shall be followed explicitly, unless otherwise directed by the District.	Functional					
3.4.3.13	Surge suppression shall be provided for all field wiring susceptible to lightning or other potential electrical surges.	Functional					
<b>3.4.4</b>	<b>Time Synchronization Requirements</b>						
3.4.4.1	All System equipment dependent on time functions shall synchronize with a System network time server using standard Network Time Protocol (NTP).	Functional					
3.4.4.2	The System shall include both primary and secondary NTP servers.	Functional					
3.4.4.3	All System equipment that utilize NTP shall automatically utilize the primary or secondary NTP server as appropriate.	Functional					
3.4.4.4	Time synchronization shall be performed whenever a device is started and no less frequently than hourly thereafter.	Functional					
3.4.4.5	The System shall automatically adjust time of day in accordance with the start and end of Daylight Savings Time.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.4.4.6	The System shall log any failure to communicate with the NTP server and generate appropriate Alerts.	Functional					
3.4.4.7	If any Lane level equipment does not support NTP, the Zone Controller shall be responsible for keeping the equipment's time synchronized.	Functional					
<b>3.4.5</b>	<b>Single Point of Failure</b>						
3.4.5.1	The TSI shall provide a System design that minimizes the effect of any single point of failure.	Functional					
3.4.5.2	No single point of failure shall cause more than one lane to become unavailable.	Functional					
3.4.5.3	Proposers shall discuss the design concepts that accomplish the above requirement.	Proposal					
<b>3.4.6</b>	<b>Use of Original Supplier</b>						
3.4.6.1	The TSI shall utilize the original supplier or equipment manufacturer to calibrate, test and certify the operation of each critical System component both at the time of installation and at least annually during the maintenance period.	Functional					
<b>3.4.7</b>	<b>Source Code</b>						
3.4.7.1	The TSI shall deliver all materials, executable software, configuration files and related documentation in compliance with the Agreement regarding System Source Code.	Procedural					
3.4.7.2	Prior to System acceptance, source code shall be deposited in escrow using an escrow agent agreed to by both TSI and the District.	Procedural					
3.4.7.3	Source code documentation shall be sufficient to allow for compiling and testing of the source code including at a minimum a list of applicable proprietary software development tools used to implement the System.	Procedural					
3.4.7.4	Source code documentation shall provide detail on the third-party commercially available software used in conjunction with the System including name, version, sub-version number and release date.	Procedural					
3.4.7.5	The source code deposit shall also include documentation on how the third-party commercially available software is linked to the System software.	Procedural					
3.4.7.6	Source code deposits into the escrow system shall occur upon transition to the new System and within a month of any changes to the system source code.	Procedural					
3.4.7.7	Throughout the life of the Project the TSI shall use in an industry standard source code change management system.	Procedural					
<b>3.4.8</b>	<b>Bill of Materials</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.4.8.1	The TSI shall prepare and submit a Bill of Materials List that includes parts and components making up each device implemented under this project.	Procedural					
3.4.8.2	The Bill of Materials shall list part numbers at the field replacement unit level. The TSI shall provide further details, as necessary, in design or maintenance documents.	Procedural					
3.4.8.3	An updated Bill of Materials should be delivered no later than thirty (30) days after the Gantry is commissioned and the System acceptance testing has begun.	Procedural					
3.4.8.4	TSI shall provide a Bill of Materials Tracking Report to track the acquisition of equipment as approved in the final SDD, including approved spare parts.	Procedural					
3.4.8.5	The Bill of Materials Tracking Report shall be delivered with the monthly schedule to show materials that have been ordered, delivered and paid for by the TSI and indicate any deviations from the bill of materials as listed in the approved SDD.	Procedural					
<b>4</b>	<b>Gantry Requirements</b>						
<b>4.1</b>	<b>General Gantry Concepts</b>						
<b>4.2</b>	<b>Gantry Phases</b>						
<b>4.2.1</b>	<b>Gantry Responsibilities - Proposal</b>						
4.2.1.1	The Proposer shall describe the Gantry requirements to support the proposed System. This shall include, but not be limited to: single or double Gantry, Gantry spacing or width and required in-pavement devices.	Proposal					
4.2.1.2	The Proposer shall describe the equipment that would be mounted overhead, in-pavement, and adjacent to the Gantry.	Proposal					
4.2.1.3	The Proposer shall describe the required, or desired, environmental protections (e.g., roof, enclosures, heating, etc.) of the Gantry.	Proposal					
4.2.1.4	The Proposer shall indicate their understanding that the District requires that all equipment and interconnections can be repaired and/or replaced from the Gantry without closing a lane to traffic.	Proposal					
4.2.1.5	The Proposers preferred Gantry type (single or double) will not be included in the scoring of Proposals	Informational					
<b>4.2.2</b>	<b>Gantry Responsibilities - Phase 1 Business Rules and System Requirements Definition</b>						
4.2.2.1	The TSI shall appoint a Gantry Requirements Coordinator to work with and provide input to the District and Gantry Designer from Phase 1 through Phase 5.	Procedural					



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4.2.2.2	The TSI shall provide to the District a Gantry Requirements Document which is an initial list of Gantry requirements and concepts. This includes: <ul style="list-style-type: none"> <li>• Single or double Gantry</li> <li>• Gantry spacing (if double Gantry)</li> <li>• Roadway width of each Gantry</li> <li>• Gantry height and clearance</li> <li>• Environmental Protections</li> <li>• Sketch of Gantry indicating component locations</li> <li>• Component manufacturers mounting instructions</li> <li>• Power and communication connection requirements</li> <li>• Concepts to incorporate ways that the Gantry equipment can be moved laterally to accommodate changes in lane striping</li> </ul>	Functional					
<b>4.2.3</b>	<b>Gantry Responsibilities - Phase 2 System Design</b>						
4.2.3.1	The Gantry Requirements Coordinator shall be available for comments or to answer questions regarding the System during Gantry design.	Procedural					
4.2.3.2	The Gantry Requirements Coordinator shall attend scheduled review meetings with the Gantry Designer during this Phase.	Procedural					
4.2.3.3	The TSI shall, in coordination with the District and Gantry Designer, ensure that the Gantry design will meet the needs of the TSI proposed architecture and environmental protection requirements.	Procedural					
4.2.3.4	The TSI shall review the Gantry design documents and note any necessary issues or changes.	Functional					
4.2.3.5	The TSI shall use the final detailed Gantry design, provided by the Gantry designer, to produce drawings indicating the actual placement of Gantry equipment, conduits, communication, power, and cabinets. These drawings shall be included in the SDD.	Functional					
4.2.3.6	The TSI shall provide its approval to the District on the Gantry design with respect to Gantry dimensions, equipment placement, protection from the elements, power requirements, and physical network requirements.	Functional					
<b>4.2.4</b>	<b>Gantry Responsibilities - Phase 3 System Development</b>						
4.2.4.1	The Gantry Requirements Coordinator shall be available for comments or to answer questions regarding the System during Gantry construction.	Procedural					
4.2.4.2	The Gantry Requirements Coordinator shall attend scheduled review meetings with the Gantry Contractor and/or Gantry Designer during this Phase.	Procedural					

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4.2.4.3	The TSI shall provide its approval to the District on the Gantry construction with respect to physical dimensions, equipment locations, protection from the elements, power service panels, and conduits.	Procedural					
<b>4.2.5</b>	<b>Gantry Responsibilities - Phase 4 Installation</b>						
4.2.5.1	The TSI shall supervise and inspect the installation of all equipment required to support the System.	Procedural					
4.2.5.2	The Gantry Requirements Coordinator shall attend scheduled review meetings as necessary with the Gantry Designer and/or Gantry Contractor during the Installation Phase.	Procedural					
4.2.5.3	The TSI shall provide its approval to the District on the Gantry installation with respect equipment installation, power and data wiring, and connections.	Procedural					
4.2.5.4	The TSI shall setup, align, calibrate, and test all System equipment following the equipment installation.	Functional					
<b>4.2.6</b>	<b>Gantry Responsibilities - Phase 5 Transition</b>						
4.2.6.1	The Gantry Requirements Coordinator shall communicate and oversee any changes required to the Gantry that become necessary during the Transition Phase.	Functional					
<b>5</b>	<b>LANE REQUIREMENTS</b>						
<b>5.1</b>	<b>GENERAL LANE REQUIREMENTS</b>						
<b>5.1.1</b>	<b>Operational Requirements</b>						
5.1.1.1	The TSI shall furnish and install a Lane which shall implement an open road all-electronic tolling system.	Functional					
5.1.1.2	The Lane shall be an industrial system designed to operate reliably in harsh environments. Its components and design will adhere to all applicable electrical and mechanical standards for industrial and traffic equipment.	Functional					
5.1.1.3	The TSI shall design the Lane electrical system such that if either District supplied AC feed should fail the second AC feed will keep the Lane equipment operational.	Functional					
5.1.1.4	The TSI shall design the Lane electrical system such that restoration of a failed District supplied UPS shall not cause an interruption in service.	Functional					
5.1.1.5	The Lane shall provide for self-testing and sensors to determine failures and, as much as practical, allow for remote maintenance, calibration, and monitoring.	Functional					
5.1.1.6	The Lane shall create Transactions for every vehicle detected in the Toll Zone at all times.	Functional					
5.1.1.7	The Lane shall create and transmit all Transactions to the Host in real-time.	Functional					
<b>5.1.2</b>	<b>Host Communication</b>						

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5.1.2.1	The Lane shall communicate with the Host via bi-directional messages.	Functional					
5.1.2.2	The Lane shall send Transaction messages to the Host.	Functional					
5.1.2.3	The Lane shall send Alert messages to the Host.	Functional					
5.1.2.4	The Lane shall send equipment status messages to the Host.	Functional					
5.1.2.5	The Lane shall receive and process command messages from the Host.	Functional					
5.1.2.6	The Lane shall receive and process Transponder Status Files from the Host.	Functional					
5.1.2.7	The Lane shall receive and process Carpool Hours data from the Host.	Functional					
5.1.2.8	necessary to meet the operational and performance requirements of the System.	Functional					
<b>5.1.3</b>	<b>Transaction Types</b>						
5.1.3.1	Toll Transaction - The Lane shall create one and only one Toll Transaction for each vehicle passing through the Toll Zone.	Functional					
5.1.3.2	Isolated Transponder Transaction - The Lane shall support a Transaction type herein referred to as an Isolated Transponder Transaction, defined as a Transaction with AVI data but no vehicle data. The Lane shall create one Isolated Transponder Transaction for each real time transponder read which could not be associated with a vehicle.	Functional					
5.1.3.3	Buffered Transponder Transaction - The Lane shall support a Transaction type herein referred to as a Buffered Transponder Transaction, defined as a Transaction with AVI data resulting from a transponder read which was buffered by the AVI reader and not delivered in real time to the Lane. The Lane shall create one Buffered Transponder Transaction for each buffered transponder read.	Functional					
5.1.3.4	Buffered Image Transaction - The Lane shall support a Transaction type herein referred to as a Buffered Image Transaction, defined as a Transaction with image data resulting from an image capture which was buffered by the Image Capture System (ICS) and not delivered in real time. The Lane shall create one Buffered Image Transaction for each buffered image.	Functional					
5.1.3.5	The Lane shall identify each of the different Transaction types by means of an identifier field, flag, or other means which shall allow filtering and querying of Transactions by type.	Functional					

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5.1.3.6	The Lane shall further designate Toll Transactions with a sub-type of either AVI, a Toll Transaction with a valid transponder at the time the Toll Transaction was created, or Image Based Toll (IBT), a Toll Transaction with an invalid transponder or no transponder at the time the Toll Transaction was created.	Functional					
<b>5.1.4</b>	<b>Vehicle Processing</b>						
5.1.4.1	The Lane shall accurately detect and track vehicles as they pass through the Toll Zone.	Functional					
5.1.4.2	The Lane shall properly correlate the AVI, Automatic Vehicle Classification (AVC) and Image Capture information for each and every vehicle that traverses the Toll Zone and shall incorporate that information into Transaction records.	Functional					
5.1.4.3	The Lane shall associate at most one transponder with any vehicle as part of a Toll Transaction.	Functional					
5.1.4.4	The Lane shall identify all transponder reads in a vehicle. The rules for which transponder shall be assigned to the vehicle and which shall generate Isolated Transponder Transactions shall be configurable by various parameters including, but not limited to: transponder status, transponder protocol, etc. The details of the rules and parameters shall be determined during the System Design Phase.	Functional					
5.1.4.5	The Lane shall be designed to properly process vehicles straddling two travel lanes as well as vehicles tailgating, stopping or traveling a various speed through the Toll Zone.	Functional					
5.1.4.6	The Lane design shall not allow any event, sequence of events, weather condition, incorrect vehicle processing, or unusual activity such as a vehicle traveling in the opposite direction of normal traffic flow, to prevent the System from automatically re-synchronizing and properly processing vehicles within two vehicles passing through the Toll Zone in the correct direction following the event.	Functional					
5.1.4.7	The Lane shall ensure that all Transactions of each type are uniquely and sequentially numbered as sent to the Host. This Lane Transaction ID number shall be independent of time, date, and Lane number.	Functional					
5.1.4.8	The Lane Transaction ID shall be used to associated the Transaction with the ICS images of the vehicle.	Functional					
5.1.4.9	The Lane shall provide a means of retransmitting selected previously sent Transactions, Alerts, Images, files and any other data to the Host.	Functional					
5.1.4.10	The Lane shall be capable of operating off-line from the Host for a minimum of 60 consecutive days with no loss of data.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.1.4.11	The Lane shall provide a means for offloading Lane data for delivery to the Host in the event of sustained communications failure.	Functional					
5.1.4.12	The Lane shall transmit buffered data in a first-in-first-out fashion to the Host.	Functional					
5.1.4.13	The Lane shall generate appropriate Alerts whenever there is an indication of data loss or failure of normal operations.	Functional					
5.1.4.14	The Lane shall indicate the operational status of its various sensors, including but not limited to AVI, AVC, and ICS, within each Transaction (i.e., Lane health)	Functional					
5.1.4.15	The Lane shall utilize the transponder read data provided by the AVI reader to populate the Transaction messages sent to the Host. The read data will depend on the protocol of the transponder.	Functional					
5.1.4.16	The Lane shall ensure transmission of a complete and accurate Transaction record, including date and time, unique Transaction identifier, and other relevant data elements.	Functional					
5.1.4.17	Transactions generated by the Zone Controller shall include, but not be limited to, the following data: <ul style="list-style-type: none"> <li>• Lane Transaction ID</li> <li>• Transaction Type</li> <li>• Entry Time – Date/time vehicle first detected in the Toll Zone</li> <li>• Exit Time – Date/time vehicle exited the Toll Zone</li> <li>• AVI Protocol Indicator</li> <li>• Transponder Data (including switch status)</li> <li>• Transponder status</li> <li>• AVC data (e.g., axles, profile, etc.)</li> <li>• Vehicle speed</li> <li>• Travel lane number</li> <li>• Carpool hours flag</li> <li>• Sensor status data</li> <li>• ALPR data and confidence levels (if ALPR is done in the Lane)</li> </ul>	Functional					
<b>5.2</b>	<b>ZONE CONTROLLERS</b>						
<b>5.2.1</b>	<b>Zone Controller Hardware</b>						
5.2.1.1	The TSI shall furnish and install a pair of industrial grade Zone Controllers for control of the Lane level equipment.	Functional					
5.2.1.2	The Primary Zone Controller shall collect all sensor inputs, control all Lane devices and shall interface to the Host and other systems as necessary to implement the functionality defined herein.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.2.1.3	The Zone Controller shall employ industry standard, commercial, off-the-shelf (COTS) components. Non-COTS Zone Controller hardware may be considered for use, subject to District approval. However, for the non-COTS hardware to be approved, all operation manuals, drawings and instructions that enable construction and assembly, installation, repair, and modification of the hardware, as well as property and use rights sufficient to use the drawings for these purposes, are to be provided to the District.	Functional					
5.2.1.4	The Zone Controllers shall be equipped with sufficient processing, storage, and memory capacity to meet the traffic speeds and volumes as required herein.	Functional					
5.2.1.5	The Zone Controllers shall be installed in cabinets on a pad adjacent to the Gantry. Alternate Zone Controller locations may be considered, subject to District approval. The pad, if used, will be part of the Gantry design and installation done by others.	Functional					
5.2.1.6	The Zone Controllers shall utilize redundant components to minimize the impact of individual hardware failures. These components shall include, but not be limited to, redundant hot-swappable power supplies and redundant, hot-swappable cooling fans	Functional					
5.2.1.7	The Zone Controllers shall utilize solid state drives.	Functional					
5.2.1.8	The pair of Zone Controllers shall be configured to operate in a master/slave configuration with automatic failover from one to the other as necessary to ensure continuous service.	Functional					
5.2.1.9	The failover from one Zone Controller to the other shall be transparent to the rest of the System and shall not require manual intervention, reconfiguration of any other devices.	Functional					
5.2.1.10	Failover from one Zone Controller to the other shall not require more than 10 seconds during which time transponder numbers and images may be buffered.	Functional					
5.2.1.11	The TSI shall not be penalized for the loss of transactions during the failover time provided transponders and images are buffered and recovered.	Functional					
5.2.1.12	The failover from one Zone Controller to the other shall not cause an overlap or gap in Transaction ID numbering.	Functional					
5.2.1.13	The trigger for Zone Controller failover and back shall be defined in the design phase.	Functional					
5.2.1.14	A utility shall be provided to allow maintenance personnel to remotely switch between using the primary Zone Controller from and to the secondary Zone Controller.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.2.1.15	During the Maintenance Phase the TSI shall periodically alternate the Primary and Secondary Zone Controllers to ensure they are functioning properly.	Functional					
5.2.1.16	All failover events, whether automatic or manually triggered, shall be logged and generate appropriate Alerts.	Functional					
5.2.1.17	In the event that communication is lost to the Host, the Zone Controller shall be capable of operating unattended, autonomously, on a continuous basis, and shall not require human intervention for purposes other than for maintenance.	Functional					
5.2.1.18	In the event the Zone Controller is unable to communicate with the Host, the Zone Controller shall buffer all data normally transmitted to the Host.	Functional					
5.2.1.19	Buffered Zone Controller data shall be automatically transmitted in a first-in-first-out fashion upon resuming normal communications with the Host.	Functional					
5.2.1.20	The Zone Controller shall have the capability to replay/retransmit data already transmitted to the Host to address situations where there may have been data loss at the Host.	Functional					
5.2.1.21	The Zone Controller data replay function shall be accessible only to authorized users.	Functional					
5.2.1.22	To address periods of extended communications failure, the Zone Controller and Host shall provide functions for authorized users to transfer data between these systems via a removable, local storage device in a secure manner.	Functional					
5.2.1.23	Data off-loaded from the Zone Controller shall remain on the Zone Controller and, upon resuming normal communications, the Zone Controller shall verify that all off-loaded data has been successfully received by the Host.	Functional					
<b>5.2.2</b>	<b>Zone Controller Operating System</b>						
5.2.2.1	The Zone Controller shall utilize an industrial-grade, real-time Operating System.	Functional					
5.2.2.2	The Zone Controller Operating System shall provide for real-time operation, multi-tasking support, process level scheduling and priority configuration.	Functional					
5.2.2.3	The TSI shall have utilized the Zone Controller Operating System on at least one previous ORT toll system project that has completed operational acceptance.	Functional					
<b>5.2.3</b>	<b>Zone Controller Database</b>						
5.2.3.1	Any Database software used by the Zone Controllers or other Lane components shall be COTS software.	Functional					
<b>5.2.4</b>	<b>Zone Controller Logs</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.2.4.1	The Zone Controller shall generate Operating System logs recording System startup, shutdown, and operation of System services.	Functional					
5.2.4.2	The Zone Controller shall generate access logs recording all remote and local access to the Zone Controller.	Functional					
5.2.4.3	The Zone Controller shall generate security logs recording all successful and failed attempts to access the Zone Controller.	Functional					
5.2.4.4	The Zone Controller shall generate application logs recording Zone Controller application startup, shutdown, Transaction activity, file uploads and downloads, and remote requests.	Functional					
5.2.4.5	The Zone Controller shall generate process logs recording detailed application process events. Process logs shall support a "logging level" which shall control the level of detail recorded in the log. Each Zone Controller software process shall have its own distinct log for recording events.	Functional					
5.2.4.6	Each Zone Controller software process shall have its own distinct log for recording events.	Functional					
5.2.4.7	In addition to application and system logs, the Zone Controller shall generate a separate and distinct "event" log which shall contain a detailed listing of all sensor events in the order in which they were received. Each sensor event shall contain a timestamp of when the event occurred. The timestamp shall be to the millisecond level or finer if possible. The event log shall also contain sufficient information to tie back events to distinct Transactions.	Functional					
<b>5.3</b>	<b>AUTOMATIC VEHICLE IDENTIFICATION (AVI) SYSTEM</b>						
<b>5.3.1</b>	<b>AVI Requirements</b>						
5.3.1.1	The TSI shall furnish and install a tri-protocol AVI system to read transponders passing through the Toll Zone.	Functional					
5.3.1.2	The AVI system shall incorporate redundant readers to mitigate the inability to read transponders.	Functional					
5.3.1.3	The AVI system shall initially support Title-21 (see Section 5.3.2) and 6C protocol transponders and shall be fully interoperable with all transponders issued by CTOC agencies.	Functional					
5.3.1.4	The TSI shall deactivate the third protocol under this scope of work.	Functional					
5.3.1.5	The TSI shall enter into appropriate non-disclosure agreements with the AVI vendor as necessary to allow the TSI, acting as the District's agent, to develop interfaces to the AVI equipment.	Functional					
5.3.1.6	The TSI shall perform an RF spectrum survey at the proposed Toll Zone and identify and accommodate any site conditions (including electromagnetic interference) that may potentially degrade the performance of the AVI system.	Functional					



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.3.1.7	The AVI system shall correctly process transponders in vehicles passing through the Toll Zone at all speeds from stop-and-go, bumper-to-bumper traffic to 100 miles per hour while meeting the performance requirements set forth within this RFP.	Functional					
5.3.1.8	The AVI system shall provide full coverage on and between all travel lanes in the Toll Zone.	Functional					
5.3.1.9	The AVI system shall be configured and tuned by a professional with documented experience with the AVI system.	Functional					
5.3.1.10	The Lane shall be designed, configured and tuned to eliminate the potential for cross lane reads, transponder pass backs, transponder pass forwards and other AVI assignment errors. This shall also apply to the typical performance differences between interior mounted transponders and license plate mounted transponders.	Functional					
5.3.1.11	The AVI system shall transmit data to the Zone Controller for each transponder read.	Functional					
5.3.1.12	Writing to transponders is not required.	Functional					
5.3.1.13	The Lane shall provide the capability to remotely view and modify all software-configurable parameters of the AVI reader.	Functional					
5.3.1.14	Loss of communication to any port on the AVI reader shall be immediately detected by the Lane and an appropriate Alert message generated.	Functional					
5.3.1.15	The date and time associated with Transactions generated from buffered transponder reads shall be the date and time the transponder was read as indicated by the AVI Reader, not the date and time it was received by the Zone Controller	Functional					
5.3.1.16	The System shall adhere to all AVI Reader synchronization requirements for purposes of avoiding mutual interference between readers, channels, and antennas.	Functional					
5.3.1.17	The AVI system shall properly detect and report the state of the HOV switch on switchable transponders.	Functional					
5.3.1.18	The Lane shall ensure that only one Toll Transaction is created by or associated with one multi-protocol transponder per the business rules. Other protocol reads from the same transponder shall result in Isolated	Functional					
5.3.1.19	The AVI system shall be compliant with IBTTA North American Toll Interoperability Program Electronic Toll Collection Protocol Requirements (see <a href="http://ibtta.org/sites/default/files/documents/IOP/Final%20NIOP%20Requirements%20Document.pdf">http://ibtta.org/sites/default/files/documents/IOP/Final%20NIOP%20Requirements%20Document.pdf</a> ).	Functional					
<b>5.3.2</b>	<b>Title-21</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.3.2.1	The System shall be fully compliant with Title-21 of the California Code of Regulations which establishes the technical requirements for ETC readers and transponders used in the State of California. The TSI shall supply AVI equipment in compliance with this regulation and shall ensure that the System implementation provides AVI compatibility with other California Toll Operators.	Functional					
5.3.2.2	The System shall support both traditional Title-21 and 6C California transponders which will be issued as switchable and non-switchable types. Switchable transponders are used to indicate the number of people in the vehicle at the time of the toll. Documentation related to the implementation of the various protocols will be published by CALTRANS and CTOC.	Functional					
5.3.2.3	The System shall support an additional protocol currently contemplated by the IBTTA National Interoperability initiative in support of the Federally mandated toll interoperability in accordance with MAP-21. These protocols have been identified as 6C, SeGo, and TDM.	Functional					
5.3.2.4	The TSI shall ensure that the antennas operating on the new System during Phase 4 and Phase 5 do not interfere with the operation of the current system.	Functional					
5.3.2.5	The TSI shall address, in the Proposal, ways to ensure that the Title-21 protocol requirement that transponders stop communicating with the acknowledging reader for 10 seconds following the acknowledge command, will not prevent full testing of the new System with live traffic during Phase 4 and Phase 5.	Proposal					
<b>5.4</b>	<b>AUTOMATIC VEHICLE CLASSIFICATION (AVC) SYSTEM</b>						
<b>5.4.1</b>	<b>Primary Automatic Vehicle Classification (AVC) Requirements</b>						
5.4.1.1	The TSI shall implement a primary Automatic Vehicle Classification (AVC) system which classifies vehicles by axle in accordance with the current classification structure in place at the Golden Gate Bridge.	Functional					
5.4.1.2	The AVC system shall determine the vehicle axle count using sensors, not by inference or estimation. Treadles and treadle strips are not acceptable.	Functional					
5.4.1.3	The AVC system shall detect and report the following vehicle classes: <ul style="list-style-type: none"> <li>• 2 axle</li> <li>• 3 axle</li> <li>• 4 axle</li> <li>• 5 axle</li> <li>• 6 axle</li> <li>• 7+ axle</li> </ul>	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.4.1.4	The AVC system shall detect and classify all vehicles passing through the Toll Zone at all speeds from stop-and-go, bumper-to-bumper traffic, to 100 miles per hour, while meeting the performance requirements set forth	Functional					
5.4.1.5	The AVC shall properly identify and separate vehicles traveling side-by-side, straddling lanes, following closely together, sharing part of the same lane, or changing lanes.	Functional					
5.4.1.6	The AVC shall operate in all weather conditions present at the proposed location, 24 hours a day, seven days a week without degradation while meeting the performance requirements set forth in this RFP.	Functional					
5.4.1.7	The AVC system shall monitor and log the state of its various components and report any equipment failures or degradation to the Zone Controller.	Functional					
<b>5.4.2</b>	<b>Secondary AVC Requirements</b>						
5.4.2.1	The TSI shall provide a secondary method of detecting and classifying vehicles in the event the primary AVC system fails.	Functional					
5.4.2.2	The Secondary AVC shall adhere to all the requirements of the primary AVC as detailed in Section 5.4.1, except that the secondary AVC can infer the axle count from the profile.	Functional					
5.4.2.3	Failover from the primary AVC to the secondary AVC, and back, shall be automatic.	Functional					
5.4.2.4	Failover from the primary AVC to the secondary AVC or restoration of the primary AVC shall generate an Alert.	Functional					
<b>5.4.3</b>	<b>Speed Detection</b>						
5.4.3.1	The Lane shall detect the speed of all vehicles passing through the Toll Zone and report the speed to the Host as part of the Transaction.	Functional					
<b>5.5</b>	<b>IMAGE CAPTURE SYSTEM (ICS)</b>						
<b>5.5.1</b>	<b>Image Capture System Requirements</b>						
5.5.1.1	The Lane shall incorporate an ICS which captures front and rear images of all vehicles traversing the Toll Zone and associates them with Transactions.	Functional					
5.5.1.2	Front and rear images shall provide sufficient resolution and field of view to encompass the typical license plate mounting location on all vehicles traversing the Toll Zone.	Functional					
5.5.1.3	The ICS shall capture at least one front and one rear image of every vehicle traveling through the Toll Zone. This shall include vehicles with valid transponders.	Functional					
5.5.1.4	The ICS shall provide full coverage on and between all travel lanes in the Toll Zone.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.5.1.5	The ICS shall capture images of all vehicles passing through the Toll Zone at all speeds from stop-and-go, bumper-to-bumper traffic, to 100 miles per hour, while meeting the performance requirements set forth within this	Functional					
5.5.1.6	The ICS cameras shall be installed and adjusted to optimize the capture of useable license plate images.	Functional					
5.5.1.7	The ICS shall operate in all weather conditions present at the proposed location and 24 hours a day, seven days a week without degradation while meeting the ICS performance requirements set forth in this RFP.	Functional					
5.5.1.8	The ICS shall provide adequate supplemental lighting to ensure visible and legible license plates in both rear and front images in all lighting conditions.	Functional					
5.5.1.9	ICS illumination shall not present a distraction or obstruct the visibility of drivers in the Toll Zone.	Functional					
5.5.1.10	The ICS shall be synchronized and exchange data with the Zone Controller to ensure that vehicle images are properly associated with the correct vehicle and its transaction data.	Functional					
5.5.1.11	Images shall be stored in JPEG format with a configurable compression/quality factor.	Functional					
5.5.1.12	Uniquely identifying Transaction data, including but not limited to Lane Transaction ID, Transaction date/time, Lane number, and front/rear indication, shall be encoded in the header or comment block of the image.	Functional					
5.5.1.13	The quantity, sizes and compression factor of images shall take into consideration the need for human review as well as potential network bandwidth restrictions.	Functional					
5.5.1.14	The ICS shall employ a store-and-forward mechanism and retain images for a minimum of 60 days after transmission to the Host.	Functional					
5.5.1.15	The ICS shall automatically purge retained images when the amount of free disk space drops below a configurable threshold, but not less than 60 days after transmission to the Host.	Functional					
5.5.1.16	The ICS shall monitor and log the state of its various components, including but not limited to processors, available disk space, light sensors, cameras, network devices, and illuminators, and report any equipment failures or degradation to the Zone Controller as Alarms.	Functional					
5.5.1.17	The TSI shall provide an ICS that shall capture and store license plate images if both Zone Controllers become inoperable.	Functional					
5.5.1.18	The capture (trigger) and storage of license plate images shall not be solely dependent on the Zone controllers.	Functional					

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5.5.1.19	The Proposer is advised that California will require that dealers provide temporary license plates for all vehicles leaving the dealership starting January 2019. These plates may be made of paper and may or may not be retroreflective.	Informational					
5.5.1.20	The TSI shall provide for the capture and performing ALPR on temporary license plates in their design at the same (or better) performance levels as permanent license plates.	Functional					
5.5.1.21	Useable license plate images are those that had no restrictions to their capture (e.g. obstructed by another vehicle) and are human readable	Informational					
<b>5.5.2</b>	<b>Automatic License Plate Recognition (ALPR)</b>						
5.5.2.1	The System shall incorporate ALPR for the extraction of license plate information (issuing jurisdiction, plate numbers/letters and plate type) from captured images and associate these results with Transactions (Plate Data). Plate Data shall include stacked characters and any required plate character prefixes or suffixes.	Functional					
5.5.2.2	The ALPR can be a component of the Lane or the Host.	Functional					
5.5.2.3	The ALPR shall assign to each license plate/vehicle image captured a Confidence Level. The Confidence Level is a figure of merit for each image and the various elements comprising Plate Data representing the likelihood that the Plate Data produced by the ALPR is correct. The Confidence Level shall be a monotonically increasing number wherein the highest level indicates 100% likelihood that the Plate Data is correct.	Functional					
5.5.2.4	The ALPR shall correctly process vertically, horizontally and diagonally stacked characters.	Functional					
5.5.2.5	The ALPR results shall include the plate characters, issuing jurisdiction and plate type for both the front and rear of the vehicle.	Functional					
5.5.2.6	The ALPR results shall include separate Confidence Levels for the front and rear license plates.	Functional					
5.5.2.7	The System shall provide a utility to review the ALPR results of stored images for quality assurance and maintenance purposes.	Functional					
<b>5.6</b>	<b>DIGITAL VIDEO AUDIT SYSTEM (DVAS) CAMERAS</b>						
<b>5.6.1</b>	<b>DVAS Camera Requirements</b>						
5.6.1.1	The System shall provide one DVAS camera and associated illumination per travel lane.	Functional					
5.6.1.2	The DVAS cameras shall have a resolution of no less than 720p (1280 by 720 pixels).	Functional					
5.6.1.3	DVAS illumination shall not pose a distraction or hazard to drivers approaching or in the Toll Zone.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.6.1.4	DVAS cameras shall capture clear and usable video regardless of lighting conditions present at the Toll Zone, and shall function as required in all weather conditions.	Functional					
5.6.1.5	provide a view of the vehicle in the Lane sufficient to determine the vehicle classification.	Functional					
5.6.1.6	The District has no preference regarding color or black and white DVAS cameras.	Informational					
<b>5.7</b>	<b>BEACON</b>						
<b>5.7.1</b>	<b>Beacon Requirements</b>						
5.7.1.1	The Lane shall incorporate an "Occupancy Beacon" located on the Gantry above each travel lane.	Functional					
5.7.1.2	The Occupancy Beacon shall illuminate when a valid transponder is detected during carpool hours with a switch setting set to a position indicating HOV2 or HOV3, as determined by the District business rules.	Functional					
5.7.1.3	The Occupancy Beacon shall utilize LED illumination and shall operate in all weather conditions normally found at the Golden Gate Bridge.	Functional					
5.7.1.4	When illuminated, the Occupancy Beacon shall be visible downstream from the Toll Zone for a distance of 100 feet, day and night, at horizontal angles of 180 degrees from the direction of traffic.	Functional					
5.7.1.5	The light from the Occupancy Beacon shall not pose a distraction or hazard to drivers approaching or in the Toll Zone.	Functional					
5.7.1.6	The color and intensity of the Beacon shall be determined in the Design Phase.	Functional					
<b>6</b>	<b>HOST REQUIREMENTS</b>						
<b>6.1</b>	<b>GENERAL HOST REQUIREMENTS</b>						
<b>6.1.1</b>	<b>Basic Host Requirements</b>						
6.1.1.1	The TSI shall furnish and install a fully functional Host.	Functional					
6.1.1.2	The Host shall allow for remote and on-site monitoring and control of all System activity.	Functional					
6.1.1.3	The Host shall accept Transactions, images, Alerts and any other Lane messages from the Lane and store them in its database.	Functional					
6.1.1.4	The Host shall meet the storage requirements specified in Section 8	Functional					
6.1.1.5	The Host shall support a minimum of twenty (20) simultaneous users accessing screens and/or running reports.	Functional					
6.1.1.6	The Host shall interface with the RCSC in full compliance with the RCSC ICD (See Appendix D).	Functional					
6.1.1.7	All Host functions shall be available via interactive screens.	Functional					
<b>6.2</b>	<b>HOST HARDWARE</b>						
<b>6.2.1</b>	<b>Host Computer Requirements</b>						

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6.2.1.1	The Host shall be furnished with primary and secondary computer systems and associated cabinet(s), one at each of two locations designated by the District.	Functional					
6.2.1.2	Each Host shall consist of industry standard, commercial-off-the-shelf servers, sized to satisfy the requirements defined herein.	Functional					
6.2.1.3	Each Host shall have sufficient hard disk space to provide storage for the life of the System while maintaining at least 25% free space.	Functional					
6.2.1.4	Each Host shall utilize less than 25% CPU capacity during peak load.	Functional					
6.2.1.5	Host equipment shall include TCP/IP connectivity and shall support SNMP monitoring and configuration.	Functional					
<b>6.3</b>	<b>HOST SOFTWARE</b>						
<b>6.3.1</b>	<b>Host Database Management Requirements</b>						
6.3.1.1	The System shall be furnished with a highly reliable and secure relational database management system (DBMS) for the storage of all data, as applicable, for the data retention periods specified herein.	Functional					
6.3.1.2	The DBMS, and the System database design, shall be flexible and scalable to enable possible future expansion.	Functional					
6.3.1.3	The DBMS shall incorporate technology that minimizes System down time.	Functional					
6.3.1.4	The DBMS shall provide run-time control limits to manage large queries or down-loads.	Functional					
6.3.1.5	The DBMS shall be configured, and the System database designed, to enforce referential integrity wherever possible using foreign keys, field-level NULL and value constraints, triggers, or similar devices.	Functional					
6.3.1.6	The DBMS shall allow Structured Query Language (SQL) access and Open Database Connectivity (ODBC) to authorized District staff.	Functional					
6.3.1.7	All System data elements shall be defined within the DBMS in metadata tables that are accessible via SQL queries.	Functional					
6.3.1.8	The DBMS and Host software shall be configured to generate all System reports without impacting transaction processing performance.	Functional					
6.3.1.9	Host application codes such as transaction types, status codes, and multi-value flags included in database field definitions shall be coded as human readable values or as foreign keys to lookup tables that contain human readable values, to facilitate query and report development.	Functional					
<b>6.3.2</b>	<b>Host Database Requirements</b>						
6.3.2.1	The Host shall generate reports and ad hoc query results from the Host database where the data is current within five (5) minutes of its creation in the System	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.3.2.2	The Host database shall contain record or message level data for the RCSC External Interface.	Functional					
6.3.2.3	The Host database shall provide the capability for users to export table data as well as export the entire Host database.	Functional					
6.3.2.4	The Host database shall be configured to optimize report generation and ad hoc user generated queries.	Functional					
6.3.2.5	All fields in the Host database shall be made available for ad hoc reporting.	Functional					
6.3.2.6	De-normalized or pre-joined data objects shall be made available to ad hoc reporting users. These convenience tables or views on tables shall be defined during the System Design Phase.	Functional					
6.3.2.7	All tables, fields, views and other database objects names made available for ad hoc reporting shall be defined and fully described in a System data dictionary.	Functional					
6.3.2.8	The Host database shall support column level encryption.	Functional					
6.3.2.9	Transponder ID numbers and license plate numbers as stored in the Host database shall be encrypted at the District's option.	Functional					
<b>6.3.3</b>	<b>Application Software Requirements</b>						
6.3.3.1	Host application software shall be developed using industry standard, high-level programming languages.	Functional					
6.3.3.2	Host application software shall utilize versions of language compilers, interpreters, build environments, version management tools, bug tracking tools, etc. that are stable and that can reasonably be expected to be fully supported by their manufacturers for at least five years into the future.	Functional					
6.3.3.3	Host application operations and business rules shall be configurable as appropriate, to be determined in cooperation with the District during the System Design Phase.	Functional					
6.3.3.4	Host configuration settings shall be stored in the Host database and be manageable from Host application screens as appropriate, to be determined in cooperation with the District during the System Design Phase.	Functional					
6.3.3.5	Host application software shall generate and maintain comprehensive, time stamped, human readable, machine parse-able logs of Transaction level activity, database updates, and user access.	Functional					
6.3.3.6	Host application software log entries for database updates shall include enough specific information that a maintenance technician with knowledge of the Host database could determine with confidence which table fields were updated, and to which values.	Functional					



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.3.3.7	Host application software shall support user access from commercial off the shelf personal computers, laptop computers, and tablets. Application access from cell phones is desired but not required.	Functional					
6.3.3.8	The Host application software shall support printing to commercial off the shelf office or personal printers.	Functional					
<b>6.3.4</b>	<b>Graphical User Interface</b>						
6.3.4.1	The Host application shall be browser based and shall support all current and two previous versions of Microsoft Internet Explorer, Chrome (both Windows and Android versions), and Safari (both OS X and iOS versions).	Functional					
6.3.4.2	The Host application shall make full use of the graphical user interface (GUI) functions provided by a browser to minimize the number of keystrokes required to interact with the System.	Functional					
6.3.4.3	The Host application shall require users to authenticate once per session and shall utilize a central authentication repository.	Functional					
6.3.4.4	The Host application shall enable users to open multiple GUI windows simultaneously. For example, a user could be viewing real-time Lane activity in one GUI window while simultaneously examining Transaction level data or associated reports in another GUI window.	Functional					
<b>6.4</b>	<b>TRANSACTION MANAGEMENT</b>						
<b>6.4.1</b>	<b>Lane Interface</b>						
6.4.1.1	The Host shall implement a robust interface to the Lane. This interface shall govern the reliable and timely exchange of all data from the Host to the Lane and for the receipt of all required data by the Host from the Lane.	Functional					
6.4.1.2	The TST shall fully document the interface between the Host and the Lane in a Host to Lane Interface Control Document (HLICD). The HLICD shall contain sufficient information on the contents of the interface and the methods/protocols of data transfer to allow others to develop to the interface if necessary.	Functional					
6.4.1.3	The TSI shall provide the District with full rights to utilize the HLICD as the District chooses.	Functional					
6.4.1.4	The Host to Lane interface shall support the error free transmission of all required Lane data from the Host to the Lane. This data shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Lane configuration data</li> <li>• Lane control messages</li> <li>• Transponder Status data</li> <li>• Carpool Hour data</li> </ul>	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.4.1.5	The Host to Lane interface shall support the error free transmission of all required Lane data from the Lane to the Host. This data shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Transactions</li> <li>• Images</li> <li>• DVAS Video</li> <li>• Status</li> <li>• Alerts</li> </ul>	Functional					
6.4.1.6	The Host to Lane interface shall use messaging and file transfer protocols that guarantee delivery of data.	Functional					
6.4.1.7	The Host shall generate appropriate Alerts whenever there is an indication of data loss or failure of normal operations.	Functional					
6.4.1.8	The Host shall employ appropriate rules and filters to detect duplicate data received from the Lane. Such duplicate data shall be stored separately from normal Lane data for further research and analysis by users.	Functional					
<b>6.4.2</b>	<b>Toll Transaction Processing</b>						
6.4.2.1	The Host shall receive sequentially numbered Transactions of each type from the Lane.	Functional					
6.4.2.2	The Host shall determine if the Lane generated Toll Transaction sub-type (AVI or IBT) is out of date and shall modify the sub-type based on the most recent Transponder Status received from the RCSC.	Functional					
6.4.2.3	For each Toll Transaction, the Host shall determine the fare from a stored table that maps the fare to Vehicle Class and business rules stored in the database for Carpool and AVI and Toll Transaction sub-type. The fare shall be included in the Toll Transaction that is sent to the RCSC.	Functional					
6.4.2.4	The Host shall generate Transaction numbers for each Toll Transaction that are consistent with the requirements of the RCSC ICD.	Functional					
6.4.2.5	The Host shall ensure that the Transaction numbers generated for the new System do not conflict or overlap with Transactions numbers from the current system.	Functional					
6.4.2.6	The Host shall use the Toll Transaction Entry Time as the date and time of record for the Toll Transaction to be sent to the RCSC and for Transaction research purposes.	Functional					
6.4.2.7	The Host shall include an Image File using the images received from the Lane for each IBT Toll Transaction sent using the RCSC ICD .	Functional					
6.4.2.8	The Host shall include the corresponding ALPR data consistent with the RCSC ICD.	Functional					
6.4.2.9	The Host shall generate a Violation Data File (VDF) for each IBT Toll Transaction consistent with RCSC ICD.	Functional					

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<b>6.4.3</b>	<b>Buffered and Isolated Transaction Processing</b>						
6.4.3.1	Host processing rules and/or procedures shall ensure that any missing tolls are sent to the RCSC and any duplicate tolls are dismissed and not sent to the RCSC. To accomplish this, these anomalous Transactions shall be treated differently depending on the failure mode.	Functional					
6.4.3.2	The Host shall include procedures, some of which may be manual, for ensuring that Isolated Transponder, Buffered Transponder and Buffered Image Transactions are processed such that there is no loss of revenue to the District and no duplicate charges to customers.	Functional					
6.4.3.3	The TSI shall develop processes and/or procedures, some of which may be manual, for the proper processing of these anomalous Transactions.	Functional					
6.4.3.4	The Host shall convert Isolated Transponder, Buffered Transponder and Buffered Image Transactions that are to be sent to the RCSC into Toll Transactions.	Functional					
6.4.3.5	The Host shall retain the previous Type of these converted Toll Transactions.	Functional					
<b>6.4.4</b>	<b>RCSC Interface</b>						
6.4.4.1	The Host shall format and group all AVI Toll Transactions and all IBT Toll Transactions into separate files for transmission to the RCSC at intervals consistent with District business rules and RCSC ICD requirements.	Functional					
6.4.4.2	The Host shall receive Transaction reconciliation files from the RCSC and update local Transaction records accordingly.	Functional					
6.4.4.3	The Host shall receive and process Transponder Status Files from the RCSC per the RCSC ICD.	Functional					
6.4.4.4	The Host shall track all RCSC file transfer activity and generate the appropriate Alerts files are not sent and accepted in either direction within the established time or fails reasonable checks for size and content.	Functional					
<b>6.5</b>	<b>REPORTING</b>						
<b>6.5.1</b>	<b>General Reporting Requirements</b>						
6.5.1.1	The System shall be furnished with a robust and comprehensive, SQL-based reporting capability allowing multiple simultaneous users to generate reports as necessary.	Functional					
6.5.1.2	The System shall generate all reports without adversely impacting the normal operations of the System.	Functional					
6.5.1.3	The System shall enable users to browse and generate reports on demand through a GUI.	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.5.1.4	Pre-defined reports shall allow users to specify various selection criteria and sort criteria, depending on the report, to be determined during the System Design Phase.	Functional					
6.5.1.5	Pre-defined reports shall be displayed in a single consistent set of fonts and font sizes, and with consistent use of margins and white space.	Functional					
6.5.1.6	The System shall produce pre-defined reports that include a standard report header and/or footer that shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Report ID (a unique numeric or alphanumeric code identifier for the report)</li> <li>• Report name</li> <li>• Report group(s)</li> <li>• Selection criteria used to generate the report</li> <li>• Page number in the format "Page X of Y"</li> <li>• ID of the user executing the report</li> <li>• Date/time the report was generated</li> </ul>	Functional					
6.5.1.7	The System shall enable users to configure pre-defined or ad hoc reports to be automatically generated on a one-time or periodic schedule.	Functional					
6.5.1.8	The System shall ensure that all selection criteria normally applicable to a report shall be available when scheduling automatic generation of a pre-defined or ad hoc report.	Functional					
6.5.1.9	The System shall enable users to schedule the automatic execution and delivery of pre-defined and ad hoc reports to email addresses, shared drives or Uniform Naming Convention (UNC) paths, or directly to a user selected printer.	Functional					
6.5.1.10	The System shall schedule pre-defined or ad hoc reports to report on time periods relative to report generation time, as appropriate to each report, for example: <ul style="list-style-type: none"> <li>• Last month</li> <li>• Yesterday</li> <li>• This month</li> <li>• Year to date</li> <li>• Last week</li> </ul>	Functional					
6.5.1.11	The System shall display reports on screen and enable users to generate pre-defined or ad hoc reports to formats that include Microsoft Excel, PDF, CSV and Hyper Text Markup Language (HTML).	Functional					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.5.1.12	The System shall enable users to generate any pre-defined report into a data-only format without page breaks, headers, footers, empty cells, group totals, grand totals, footnotes, or sub-reports; without labels and values that span multiple rows or columns; and that can be easily imported into and manipulated within Microsoft Excel, Microsoft Access, or a text editor.	Functional					
6.5.1.13	Pre-defined reports shall include navigational links to related reports or screens as appropriate, to be determined during the System Design Phase.	Functional					
6.5.1.14	Pre-defined reports shall be reconcilable and cross-referential with one another and with related informational screen displays, through the consistent use of report names, terms, value calculations, selection criteria labels, and data labels.	Functional					
6.5.1.15	The System shall include footnotes in pre-defined reports that alert users to the meanings of non-standard terms, the presence of unusual report-specific data filters, and how value calculations are performed.	Functional					
6.5.1.16	The System shall enable users to create, install, configure, and incorporate new ad hoc reports into the System, without requiring software changes.	Functional					
6.5.1.17	The System shall be provided with the appropriate tools to allow users to create new ad hoc reports.	Functional					
6.5.1.18	The System shall provide access to users to the pre-defined Reports definition files allowing them to utilize and/or copy as necessary to create new ad hoc reports.	Functional					
6.5.1.19	The System shall be furnished and configured with a separate reporting database.	Functional					
6.5.1.20	Ad hoc reports shall be generated from the reporting database.	Functional					
6.5.1.21	The reporting database shall be updated no less frequently than daily providing for reports to be run for any period up-to and including the previous day.	Functional					
6.5.1.22	The data contained in the reporting database shall include all data elements used in the operational database so as not to restrict the types of reports that can be generated.	Functional					
6.5.1.23	The reporting database shall provide its own set of database indexes optimized for reporting purposes.	Functional					
6.5.1.24	The reporting system shall allow all predefined reports to be run by weekend or weekday if appropriate to the report.	Functional					
<b>6.5.2</b>	<b>Pre-Defined Reports</b>						
6.5.2.1	The System shall provide a Southbound Traffic Counts Report. This report shall contain hourly traffic and traffic percentage by lane, and by roadside payment type, for the selected date(s).	Functional					

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6.5.2.2	The System shall provide a Monthly Traffic by Day Report. This report shall contain daily traffic and traffic percentage, by roadside payment type, for the selected month.	Functional					
6.5.2.3	The System shall provide a Two Year Traffic Comparison Report. This report shall contain total daily traffic for selected month and year, and for selected month of previous year, aligned by weekday.	Functional					
6.5.2.4	The System shall provide a Revenue by Transaction Date Report. This report shall contain daily accounting of all traffic by payment method reported by the RCSC, including RCSC interim transactions and transactions not sent to the RCSC.	Functional					
6.5.2.5	The System shall provide a Plaza to CSC ETC File Reconciliation Report. This report shall contain RCSC file exchange details of REQ files for selected days, including their associated RES files and ACK files.	Functional					
6.5.2.6	The System shall provide a Plaza to CSC IBT File Reconciliation Report. This report shall contain RCSC file exchange details of VIO files for selected days, including their associated VRES files and ACKs.	Functional					
6.5.2.7	The System shall provide a Discount, Non-Revenue and Carpool Report. This report shall contain daily discount traffic totals, reported by the RCSC, for the selected month.	Functional					
6.5.2.8	The System shall provide a FasTrak Usage Report. This report shall contain quarterly averages of FasTrak, License Plate, and One Time Payments, as reported by the RCSC, for the most recent five fiscal years; shown for all days, for weekdays, for weekends and holidays, for weekday AM and PM peak periods.	Functional					
6.5.2.9	The System shall provide performance reports that substantiate System accuracy and performance levels achieved. The details of these reports shall be finalized during the System Design Phase.	Functional					
<b>6.6</b>	<b>MAINTENANCE MANAGEMENT</b>						
<b>6.6.1</b>	<b>General Maintenance Management Requirements</b>						
6.6.1.1	The System shall record and respond appropriately to all System Alerts.	Functional					
6.6.1.2	The System shall support configurable responses based on Alert type or Alert contents.	Functional					
6.6.1.3	The System shall provide appropriate screens for managing Alerts and associated work orders. The process and screens shall be finalized during the System Design Phase.	Functional					
<b>6.6.2</b>	<b>Alerts</b>						
6.6.2.1	The TSI shall indicate in the proposal the Alerts that will be automatically generated by the System. These will form the basis of the list of Alerts during System Design.	Proposal					

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6.6.2.2	All Alerts shall be automatically sent to a distribution list maintained on the Host.	Functional					
6.6.2.3	All Alerts shall require acknowledgement by the TSI within the required response time.	Functional					
6.6.2.4	Response time for all Alerts shall be tracked in the System.	Functional					
6.6.2.5	Repair time for all Alerts shall be tracked by the System.	Functional					
6.6.2.6	A failure shall produce one and only one Alert.	Functional					
6.6.2.7	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the size of a Transponder Status File. The Transponder Status File shall not be transferred to the Lane or used for any other processing until the Alert is manually resolved.	Functional					
6.6.2.8	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the number of daily Toll Transactions.	Functional					
6.6.2.9	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the number of daily AVI Toll Transactions.	Functional					
6.6.2.10	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the number of daily IBT Toll transactions.	Functional					
6.6.2.11	Alerts shall include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• No vehicles detected in a Lane in x minutes</li> <li>• No valid AVI detected in a Lane in x minutes</li> <li>• No images captured in a Lane in x minutes</li> <li>• Loss of communication to any component in the System.</li> <li>• Loss of communication to the RCSC</li> <li>• Failure of any component in the System</li> <li>• Failed or Incomplete processing of any file or data in the System</li> <li>• Failure of any reasonableness checks</li> <li>• Any overlap or gap in Transaction Numbers</li> </ul>	Functional					
<b>6.7</b>	<b>DIGITAL VIDEO AUDIT SYSTEM</b>						
<b>6.7.1</b>	<b>Host DVAS Requirements</b>						
6.7.1.1	The TSI shall furnish a Digital Video Audit System (DVAS) that shall be used to capture and store video of Lane activity and associated Transaction and	Functional					
6.7.1.2	The DVAS shall consist of one or more industrial grade digital video recorders (DVR).	Functional					
6.7.1.3	The DVAS shall record at a frame rate of 30 frames per second per camera.	Functional					
6.7.1.4	The DVAS shall allow the user to adjust the playback speed.	Functional					
6.7.1.5	The DVAS shall provide for real-time viewing of video allowing the user to freeze and resume video playback.	Functional					

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6.7.1.6	The DVAS shall display Transaction data that is synchronized with the video as it is being reviewed. The content of the Transaction data shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Lane ID</li> <li>• Transaction ID</li> <li>• Transaction Date/Time</li> <li>• AVC Class</li> <li>• ALPR numbers and confidence levels (if any)</li> </ul>	Functional					
6.7.1.7	If a Transponder is detected in a vehicle, the DVAS shall display Transponder data in addition to the Transaction data. Transponder data shall include but not be limited to: <ul style="list-style-type: none"> <li>• Transponder Protocol</li> <li>• Transponder ID</li> <li>• HOV self-declaration status</li> </ul>	Functional					
6.7.1.8	DVAS shall be searchable. Search parameters shall include a date/time range and allow the user to specify additional parameters including but not limited to: <ul style="list-style-type: none"> <li>• Lane ID</li> <li>• Transaction ID</li> <li>• Plate Data</li> <li>• AVC Class</li> <li>• Transponder Protocol</li> <li>• Transponder ID</li> <li>• HOV self-declaration status</li> </ul>	Functional					
6.7.1.9	The DVAS system shall accommodate one DVAS camera per toll lane and permit the user to select the camera of interest.	Functional					
6.7.1.10	The DVAS shall store a minimum of 90 days of video per Lane.	Functional					
6.7.1.11	The DVAS shall be accessible from any District workstation for both real time and stored video viewing by users.	Functional					
6.7.1.12	The DVAS shall support a minimum of five concurrent users viewing a combination of real time or stored video.	Functional					
6.7.1.13	The DVAS shall provide for video and associated Transaction data covering a user specified date/time range to be exported to any District workstation in a format that can be copied to, and viewed on, any non-System workstation without the need for proprietary codecs or drivers.	Functional					
6.7.1.14	Exporting of DVAS video shall occur in the background and shall not prevent the user from utilizing other System functions.	Functional					
6.7.1.16	All DVAS video shall include an overlay of date, time, and lane number.	Functional					



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6.7.1.17	All DVAS video shall contain a watermark indicating the origin of the video. The watermark information shall be defined in the Design Phase.	Functional					
<b>6.8</b>	<b>SYSTEM MONITORING</b>						
<b>6.8.1</b>	<b>Transaction Monitoring</b>						
6.8.1.1	The TSI shall provide a transaction monitoring screen that shall display Toll Transaction details for every vehicle passing through the toll zone in near real time. The information displayed for each Transaction shall be color coded with respect to AVI Title-21, AVI 6C, or IBT and shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Lane Level Transaction ID</li> <li>• Time and Date of Entry</li> <li>• Lane # and Lane Status</li> <li>• AVI Type (T-21, AVI 6C, or IBT)</li> <li>• Transponder Information (depending on protocol)</li> <li>• Transponder Status</li> <li>• Transponder Switch Setting</li> <li>• ALPR #, State, and Confidence level (if done at lane)</li> <li>• Primary Vehicle Class</li> <li>• Secondary Vehicle Class</li> </ul>	Functional					
6.8.1.2	The transaction monitoring screen shall display other Transaction types as well with data relevant to those Transaction types. The data to be displayed shall be finalized during the System Design Phase.	Functional					
<b>6.8.2</b>	<b>Transaction Research</b>						
6.8.2.1	The TSI shall provide a screen-based tool for researching Transactional information including all Transaction types, RCSC file transfer Transactions, reconciliation status of Toll Transactions, data transfers to the lanes from the Host, unusual occurrences, and Alerts.	Functional					
6.8.2.2	The System shall provide Research screens, to facilitate access to data that is available in the Host database.	Functional					
6.8.2.3	Research screens shall provide a user-friendly graphical interface that enables users to generate queries that return result sets specific to selected research areas including, but not limited to: <ul style="list-style-type: none"> <li>• Toll Transactions and RCSC reconciliations</li> <li>• System Alerts and events</li> <li>• File transfers between the Host and the RCSC</li> <li>• Data transfers between the Host and the lanes</li> </ul>	Functional					
6.8.2.4	Research screens shall enable users to filter queries on data fields relevant to the research area.	Functional					
6.8.2.5	Research screen query filter functionality shall enable users to specify, for each selection field as appropriate:	Functional					

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6.8.2.6	Research screen selection criteria and result set fields shall be extensive and comprehensive. Criteria will be determined during the System Design Phase.	Functional					
6.8.2.7	Research screen result table displays shall enable users to sort displayed data by each result column.	Functional					
6.8.2.8	Research screen result table displays shall enable users to resize, re-order, and hide/un-hide result columns.	Functional					
6.8.2.9	Research screens shall limit the size of queries so as not to inhibit the smooth functioning of the System.	Functional					
6.8.2.10	The System shall notify users whenever returned results data has been limited by the System.	Functional					
6.8.2.11	Research screens shall return a full response to research queries within 30 seconds.	Functional					
6.8.2.12	Research screens shall enable users to navigate to related screens or reports that contain more information about displayed result records or result record field values. Such navigation shall be determined during the System Design Phase.	Functional					
6.8.2.13	Research screens shall allow the user to select any single row from a returned list of detail records, and then view all available detailed information including associated images and DVAS footage.	Functional					
6.8.2.14	Research screen drilldown screens shall themselves enable users to drilldown to more detailed information as appropriate, to be determined during the System Design Phase.	Functional					
6.8.2.15	Research screen results and selection criteria displays shall be reconcilable and cross-referential with related System reports through the consistent use of terms, value calculations, selection criteria labels, and data labels.	Functional					
6.8.2.16	The System shall enable users to print or to export research screen run time attributes, selection criteria, and result set information to industry standard formats including Microsoft Excel, PDF, CSV and HTML.	Functional					
6.8.2.17	Research screen export formats shall include a data-only format that can be easily imported into and manipulated within Microsoft Excel, Microsoft Access, or a text editor.	Functional					
<b>6.8.3</b>	<b>Dashboard Requirements</b>						
6.8.3.1	The TSI shall provide Dashboard reporting tools that enable users to view System activity, health, and statistics.	Functional					

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6.8.3.2	<u>Current vs. historic traffic flow, total and by lane.</u> This function shall display AVC detection by vehicle class, and provide transaction breakdown by AVI (each protocol) and IBT types with user configurable default time intervals determined during the Design Phase.	Functional					
6.8.3.3	<u>Current vs historic monthly revenue to date, total and by lane.</u> This function shall display absolute and percentage values with user configurable default time intervals determined during the Design Phase.	Functional					
6.8.3.4	<u>Tolling Zone Operational Status by lane.</u> This function shall display information on the operational status of each lane, such as open/closed, time since last status change, and time until next scheduled change.	Functional					
6.8.3.5	<u>Tolling Zone Health Status by lane.</u> The function shall display information on the health status of each lane, such as overall, communications, and device-specific degraded or failed status. This may be combined with the Operational Status in the Design Phase.	Functional					
6.8.3.6	<u>Alarm history.</u> This function shall display a summary view with representative statistics (numbers and graphics) for a user configurable amount of time. This view shall provide drill down capabilities which show history of all of the alarms for the same corresponding time in tabular form. This table shall be sortable and filterable by field. The maximum amount of records per page shall be determined in the Design Phase.	Functional					
6.8.3.7	<u>Transaction File Status.</u> This function shall indicate the RCSC transaction files that are pending, sent, acknowledged, percent reconciled, and aged transactions. Problematic transactions shall be grouped by their corresponding error code.	Functional					
6.8.3.8	<u>DVAS Selection</u> This function shall give the user the choice of viewing either live video or pre-recorded video over a selected time range from any DVAS camera. When viewing pre-recorded video the user can select forward, reverse, frames per second and freeze on a particular frame.	Functional					
6.8.3.9	The District may modify Dashboard requirements in favor of TSI pre-defined Dashboards. This may be done during the Design Phase.	Informational					
6.8.3.10	Proposers shall indicate the functions provided by their Dashboard displays	Proposal					
6.8.3.11	Proposers shall indicate if users of the Dashboard displays can customize their version of Dashboard displays without effecting other Users.	Proposal					

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6.8.3.12	Proposers shall indicate if their Dashboard applications include filter and drilldown capabilities that enable users to see the details of summarized data.	Proposal					
6.8.3.13	Proposers shall indicate if their Dashboard applications include the ability to scroll, resize, zoom in/out the displayed information.	Proposal					
6.8.3.14	Proposers shall indicate if their Dashboard applications give users the ability to export dashboard views to formats including PDF, HTML, PNG, CSV and Excel, and can print from the view to an available local or network printer.	Proposal					
<b>6.9</b>	<b>HOST ADMINISTRATION</b>						
<b>6.9.1</b>	<b>User Rights Management</b>						
6.9.1.1	The Host shall control the access and use rights of all System users.	Functional					
6.9.1.2	User access to the System shall be via a user name and password.	Functional					
6.9.1.3	The Host shall require user passwords to be encrypted and changed a configurable number of days per District policy.	Functional					
6.9.1.4	The System shall require the establishment of various user groups. Access to System functions shall be assigned to one or more of these user groups.	Functional					
6.9.1.5	District staff and other users shall be assigned to one or more user groups	Functional					
6.9.1.6	One of the defined user groups shall be "Administration" and only members of this group shall be given the authority to alter group rights and group assignments.	Functional					
<b>6.9.2</b>	<b>Toll Schedule Management</b>						
6.9.2.1	The toll schedule shall consist of a manually managed database table that establishes the current toll rates and new toll rates beginning on a particular date.	Functional					
6.9.2.2	The Host shall contain a Toll Schedule table in the database with an initial record and a new record added each time the toll schedule changes as established by District policy.	Functional					
6.9.2.3	The Host shall store all toll schedules in the database for the life of the System.	Functional					
6.9.2.4	The Host shall ensure that each record in the Toll Schedule Table contains a start date and time on which that toll schedule begins.	Functional					
6.9.2.5	The Host shall ensure that each record in the Toll Schedule Table has a unique ID number.	Functional					
6.9.2.6	The Host shall use the toll schedule record to relate the toll to the vehicle class, Transaction sub-type (AVI or IBT), self-declaration switch setting, carpool hours, and other parameters that effect the toll as established by District Policy.	Functional					
6.9.2.7	The Host shall determine the toll for each Transaction utilizing the toll schedule appropriate for the date and time of the Transaction.	Functional					

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6.9.2.8	The Host shall not allow changes or deletions to a toll schedule record once it is used to determine the toll of a Transaction. Changes to the toll schedule shall be made by the insertion of a new toll schedule record.	Functional					
6.9.2.9	The Host shall ensure that all Transaction records include the ID number of the toll schedule used to determine the toll.	Functional					
6.9.2.10	The Host shall require the ID and password of two District staff members with appropriate rights to create a new toll schedule record.	Functional					
<b>6.9.3</b>	<b>Carpool Hours</b>						
6.9.3.1	The Host shall enable users to establish nominal AM and PM carpool hours and modify those hours for any day of the year.	Functional					
6.9.3.2	The Host shall include a table of nominal carpool hours. This one record table will contain the start and end carpool hours to the minute.	Functional					
6.9.3.3	The Host shall establish a table of daily carpool hours with a record of carpool hours for each day of the year.	Functional					
6.9.3.4	The Host shall ensure that each record in the table of daily carpool hours has a unique ID number.	Functional					
6.9.3.5	The Host shall default to the values in the nominal carpool hours for each day but allow the carpool hours for any day to be altered by a user.	Functional					
6.9.3.6	The Host shall ensure that all Transaction records include the ID number of the daily carpool hours used to determine the toll.	Functional					
6.9.3.7	The Host shall maintain the records of daily carpool hours for the life of the System.	Functional					
<b>6.9.4</b>	<b>Holiday Calendar</b>						
6.9.4.1	The Host shall include a calendar that lists all holidays for which carpool hours will not apply.	Functional					
6.9.4.2	The Host shall allow users to indicate holidays up to fifteen (15) years from the Go-Live date.	Functional					
6.9.4.3	The Host shall support a Holiday Calendar Table with one record for each holiday for which carpool hours do not apply.	Functional					
6.9.4.4	The Host shall not allow deletion of holiday records once the holiday has passed.	Functional					
6.9.4.5	The Transaction processing system shall use the Holiday Calendar in the determination of Transaction tolls.	Functional					
<b>7</b>	<b>NETWORK INFRASTRUCTURE</b>						
<b>7.1</b>	<b>CONCEPTUAL NETWORK</b>						
<b>7.1.1</b>	<b>District Network Requirements</b>						
7.1.1.1	The TSI shall provide redundancy in the Gantry switches such that a single switch failure shall not cause a loss in toll revenue.	Functional					

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7.1.1.2	The TSI shall utilize an internet service provider (ISP) to establish remote access to the System. District approval of the provider and hardware is required. The ISP installed devices shall NOT allow for wireless connection to the System.	Functional					
7.1.1.3	The System shall be furnished with a firewall (the TSI ISP Firewall) configured to protect the ISP connection to the System.	Functional					
7.1.1.4	protecting the System from the District network and the District network from the System.	Functional					
7.1.1.5	The Toll Firewall protecting the System shall be configured and controlled by the TSI.	Functional					
7.1.1.6	The Toll Firewall protecting the District network shall be configured and controlled by the District.	Functional					
7.1.1.7	The TSI shall provide three dedicated workstations directly connected to the Toll Network using existing fiber. These workstations shall be fully loaded with all software necessary to operate the System.	Functional					
7.1.1.8	The TSI shall furnish, configure and maintain all System network related equipment, cabling, fiber, connectors and other components as necessary to form a fully functioning System network.	Functional					
7.1.1.9	The TSI shall use Cisco network products wherever possible.	Functional					
7.1.1.10	All fiber, media converters, jumpers and connector types must be approved by the District.	Functional					
7.1.1.11	All access to the System via the internet shall use a virtual private network (VPN) connection.	Functional					
<b>8</b>	<b>DATA STORAGE AND RECOVERY</b>						
<b>8.1</b>	<b>LANE DATA STORAGE</b>						
<b>8.1.1</b>	<b>Lane Data Storage Requirements</b>						
8.1.1.1	The Zone Controller shall be equipped with sufficient storage capacity to hold at least 60 days of Transaction, image, and detailed sensor data.	Functional					
8.1.1.2	The Zone Controller shall retain all logs (operating system, application, event, etc.) for a period of not less than six (6) months.	Functional					
8.1.1.3	The Zone Controller shall retain all other data not explicitly specified for a period of not less than six (6) months.	Functional					
8.1.1.4	The Zone Controller shall always have a minimum of 50% free disk space.	Functional					
<b>8.2</b>	<b>HOST DATA STORAGE</b>						
<b>8.2.1</b>	<b>Host Data Retention and Personally Identifiable Information Requirements</b>						
8.2.1.1	The Host database shall retain all database data for the required life of the System (except for Images if they are stored in the database).	Functional					

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8.2.1.2	The Host shall retain Image data for a minimum of three (3) years.	Functional					
8.2.1.3	The Host shall retain RCSC files (other than the Transponder Status File) for a minimum of one (1) year.	Functional					
8.2.1.4	The Host shall retain RCSC Transponder Status Files for a minimum of thirty (30) days.	Functional					
8.2.1.5	The Host shall retain application and operating system logs for a minimum of six (6) months.	Functional					
8.2.1.6	The TSI shall identify in its Proposal all Personally Identifiable Information (PII) stored by the System.	Functional					
8.2.1.7	The Host shall store all PII in encrypted form.	Functional					
<b>8.3</b>	<b>HOST BACKUP AND DATA RECOVERY</b>						
<b>8.3.1</b>	<b>Host Backup Requirements</b>						
8.3.1.1	The Host shall backup all data to a TSI provided cloud backup solution.	Functional					
8.3.1.2	The Host shall also backup to the cloud backup solution all program executables, configuration data and all other information necessary to affect a complete restoration of all Host functionality.	Functional					
8.3.1.3	The backup frequency shall be no less than daily.	Functional					
8.3.1.4	In the event that both the primary and secondary Hosts are unavailable, the TSI shall provide a replacement Host, restore from the cloud solution on the replacement Host, and resume all Host processing within seven (7) days.	Functional					
<b>8.3.2</b>	<b>Host Data Recovery Requirements</b>						
8.3.2.1	The Host shall be configured to replicate, in real time, all database data between the primary Host and secondary Host.	Functional					
8.3.2.2	The Host shall be designed and configured to support a Recovery Point Objective (RPO) of zero (0) data loss, for revenue-related data including RCSC activity.	Functional					
8.3.2.3	The Host shall be designed and configured to support a Recovery Point Objective (RPO) of less than four (4) hours of data loss, for other System data.	Functional					
8.3.2.4	The Host shall be designed and configured to support a Recovery Time Objective (RTO) of four (4) days, for recovery of full user level and System level functionality, at the required RPO.	Functional					
8.3.2.5	Failover from the Primary to the Secondary Host or from the Secondary to the Primary Host shall be a manual process.	Functional					
8.3.2.6	Failover from the Primary to the Secondary Host shall result in no loss of data.	Functional					

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8.3.2.7	Failover from the Primary to the Secondary Host shall cause all devices that communicate with the Host to automatically resume communications with the Secondary Host with no manual intervention. This shall include the Lane, Workstations, and external systems.	Functional					
<b>9</b>	<b>MAINTENANCE REQUIREMENTS</b>						
<b>9.1</b>	<b>GENERAL</b>						
<b>9.1.1</b>	<b>TSI Responsibility</b>						
9.1.1.1	Basic - The TSI shall be responsible for the correct operation of the System.	Maintenance					
9.1.1.2	Cost items - In addition to the basic equipment and labor necessary to maintain the System the TSI shall pay for all other required maintenance costs including shipping, communications, internet, spares, third-party support, and necessary support equipment and facilities.	Maintenance					
9.1.1.3	Remote Availability - The TSI shall be available remotely twenty-four (24) hours a day, seven (7) days a week to ensure the System meets all specified performance and functional requirements.	Maintenance					
9.1.1.4	On-Site Availability - The TSI shall provide on-site support within required response times if on-site District assistance is not available or able to resolve an issue.	Maintenance					
9.1.1.5	Period of Performance - The TSI shall provide required maintenance services for a period of five (5) years starting the day the System is opened for public use (i.e., Go-Live).	Maintenance					
9.1.1.6	Governing Document - The TSI shall perform the maintenance services according to the System Maintenance Manual submitted to and approved by the District.	Maintenance					
<b>9.1.2</b>	<b>District Responsibility</b>						
9.1.2.1	Lane Closures - If necessary the District will be responsible for all Lane closures required to access equipment on the Gantry or on the roadway.	Maintenance					
9.1.2.2	Maintenance of traffic - The District shall provide all maintenance of traffic. The TSI shall follow District and Caltrans procedures for Lane access and all other appropriate safety requirements.	Maintenance					
9.1.2.3	Accidents - The TSI shall perform, and the District will pay, for all repairs necessary due to accidents or acts-of-God beyond the control of the TSI.	Maintenance					
9.1.2.4	Power - The District will be responsible for providing UPS, generator backed, 120 v power to an external location designated by the TSI as part of the Gantry.	Maintenance					
9.1.2.5	Estimated Lane level power requirements shall be specified by the TSI in their Proposal.	Proposal					



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9.1.2.6	Repair Assistance - If available, the District will physically check and replace ready-to-go Gantry components.	Maintenance					
9.1.2.7	Software - The District will not install any software.	Informational					
9.1.2.8	Current System Removal - The District will physically disconnect and remove legacy equipment following successful transition of operations and data to the System. The timing of this will be at the District's discretion.	Maintenance					
<b>9.1.3</b>	<b>Third-Party Agreements</b>						
9.1.3.1	The TSI shall enter into all necessary third-party support agreements from the original manufacturer or supplier for the following equipment or functions: <ul style="list-style-type: none"> <li>• Host Database</li> <li>• Host Operation System</li> <li>• Transponder Reader</li> <li>• Smart loops (if used)</li> <li>• ALPR</li> <li>• All software license providers</li> </ul>	Maintenance					
9.1.3.2	Third-party Agreements shall include the setup and test of at least one System at the TSI development site.	Maintenance					
9.1.3.3	Third-party Agreements shall include direct support on the initial installation and calibration of the equipment or function.	Maintenance					
9.1.3.4	Third-party Agreements shall include 24X7 priority remote support directly to the product or function, permitting the original manufacturer/supplier to interrogate, monitor, adjust, test, patch, and update software/firmware directly.	Maintenance					
9.1.3.5	The TSI shall be responsible for required response and repair regardless of the terms of the Third-party Agreements.	Maintenance					
9.1.3.6	Third-party Agreements shall be in force for the entire duration of the maintenance contract.	Maintenance					
9.1.3.7	All third-party support agreements will be between the TSI and the third-party, but all must include provisions stating that they are assignable to the District in the event the Agreement between the District and the TSI terminates or expires.	Maintenance					
9.1.3.8	The TSI will be responsible for controlling and monitoring remote system access by third-party service providers.	Procedural					
<b>9.1.4</b>	<b>Test Facilities</b>						
9.1.4.1	The TSI shall maintain a test facility that will allow for development, factory testing and testing of new equipment, upgrades, and software changes.	Maintenance					
9.1.4.2	The test facility shall include a fully functional Lane and a fully functional Host	Maintenance					

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9.1.4.3	The test facility shall be made available for maintenance support if necessary consistent with the specified repair times.	Maintenance					
<b>9.1.5</b>	<b>Spare Parts Inventory</b>						
9.1.5.1	The TSI shall be responsible for the purchase, delivery, test and maintenance of all spare parts which shall be interchangeable and equal in quality to original equipment parts.	Maintenance					
9.1.5.2	The TSI shall establish a program for managing spare parts and equipment in a secure manner that includes: <ul style="list-style-type: none"> <li>• Record keeping of inventories;</li> <li>• Determination of reorder points;</li> <li>• Maintaining supplier information;</li> <li>• Parts acquisition and distribution;</li> <li>• Testing the initial functionality of all spare parts and equipment.</li> </ul>	Maintenance					
9.1.5.3	The TSI shall make inventory information available to the District upon request.	Maintenance					
9.1.5.4	The TSI shall keep a sufficient inventory (at least one each of Lane equipment) of spare parts at the District to allow for the prompt replacement of failed components.	Maintenance					
9.1.5.5	The TSI shall keep one of each type of System equipment at the TSI site. This may include equipment used for the test System.	Maintenance					
9.1.5.6	Spare parts shall include cables, connectors, and related tools that are used in the System.	Maintenance					
9.1.5.7	The TSI shall replace components that have been repaired three times or more at GGB's option.	Maintenance					
9.1.5.8	The TSI shall present to the District a listing of the actual inventory on a quarterly basis.	Maintenance					
<b>9.1.6</b>	<b>Lane Support Tools</b>						
9.1.6.1	The TSI shall provide all installation, calibration, and diagnostic tools required to maintain and support the System	Maintenance					
9.1.6.2	Lane support tools shall be stored at the District or be readily available in support of required repair times.	Maintenance					
<b>9.1.7</b>	<b>Coordination of Work</b>						
9.1.7.1	The TSI shall be responsible for the initial response and the identification and isolation of all reported issues.	Maintenance					
9.1.7.2	The TSI shall invoke any relevant third-party services agreements as soon as possible and where relevant. However, the TSI remains ultimately responsible for the proper operation of the System.	Maintenance					
9.1.7.3	The TSI shall coordinate work with other parties such as DISTRICT electricians, and the Customer Service Center, to fully resolve any issues with the System.	Maintenance					
<b>9.1.8</b>	<b>Staffing and Organization</b>						

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9.1.8.1	The TSI shall establish and maintain organizational resources appropriate to the work to be performed to maintain the System.	Maintenance					
9.1.8.2	The TSI shall assign the appropriate number of knowledgeable trained staff, acceptable to the District, with skills appropriate to the tasks to be performed.	Maintenance					
9.1.8.3	The TSI shall ensure that at least two persons employed by the TSI will have the knowledge and ability to maintain any site function at any given time.	Maintenance					
9.1.8.4	The TSI shall provide qualified persons, acceptable to the District, for relief of the assigned staff in the event of vacation, illness, personal business or any other absence.	Maintenance					
9.1.8.5	The TSI shall establish a telephone number (capable of receiving text messages) and email address for reporting problems and placing service requests to technicians.	Maintenance					
9.1.8.6	All calls from the District to TSI maintenance shall be answered by a live person.	Maintenance					
9.1.8.7	The TSI shall provide maintenance staff with cell phones, laptop computers and wireless internet access to respond to requests for services within the required response time.	Maintenance					
9.1.8.8	The TSI, shall, prior to the start of the Maintenance Phase, list the number, location and position of full time staff assigned to System maintenance and the percentage of time allocated to the District's System project. The list shall also indicate any part-time, support, or other staff assigned to the Maintenance work.	Maintenance					
9.1.8.9	The TSI shall update the list of Maintenance staff whenever the maintenance staff changes and submit it with the monthly reports.	Maintenance					
9.1.8.10	The TSI shall keep all information regarding its maintenance activities confidential and communicate such information only to authorized District personnel or District designated representatives.	Maintenance					
9.1.8.11	The TSI and others under the management of the TSI shall adhere to the District rules and regulations regarding physical access to all bridge properties.	Maintenance					
9.1.8.12	All maintenance staff shall pass a District security clearance if required by the District.	Maintenance					
<b>9.1.9</b>	<b>Licenses</b>						
9.1.9.1	The TSI shall obtain all necessary software and hardware licenses and assign these licenses to the District.	Maintenance					
9.1.9.2	The TSI shall keep all licenses current throughout the contract.	Maintenance					
9.1.9.3	The TSI shall ensure that all licenses and the information necessary to maintain those licenses, is in the District's position throughout the contract.	Maintenance					

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9.1.9.4	The TSI shall keep copies of all licenses throughout the contract.	Maintenance					
9.1.9.5	The cost of licenses shall be included in the TSI System and Maintenance pricing.	Maintenance					
<b>9.2</b>	<b>TSI ACTIVITIES</b>						
<b>9.2.1</b>	<b>Remote Monitoring and Maintenance</b>						
9.2.1.1	System monitoring includes the requirement that the TSI take immediate corrective action to resolve any detected malfunctions or anomalies.	Maintenance					
9.2.1.2	During System operation the TSI shall check System monitoring devices and programs, run-time System utilization parameters, and other diagnostic tools (e.g., file size and allocations, processor loading, response times, etc.) to ensure that all aspects of the System are operating properly and the System is meeting all specified performance criteria. The monitoring schedule shall be included in the System Maintenance Plan.	Maintenance					
9.2.1.3	The TSI shall perform reviews of System and regular System upkeep. On a scheduled basis, check the hardware and software components of the System to ensure that all components are present and operating within specified parameters. Based on these reviews, perform needed System upkeep (e.g. purging obsolete files from directories, etc.) to ensure uninterrupted operation of the System.	Maintenance					
9.2.1.4	The TSI shall monitor the integrity of databases. On scheduled and ad hoc basis as appropriate, review System databases (tables, indexes, views/queries, etc.) to ensure that all databases are properly updated and that appropriate integrity of all System databases is maintained.	Maintenance					
9.2.1.5	The TSI shall maintain logs of all scheduled and unscheduled monitoring and System upkeep activities. The logs shall be maintained on the Host and the District shall have access to the logs.	Maintenance					
9.2.1.6	The TSI shall maintain logs or other appropriate records of all monitoring activities, anomalies found, and measures taken to correct these anomalies.	Maintenance					
9.2.1.7	The TSI shall respond to routine operational requests (e.g. network mask, IP addresses, reconfigure VLAN).	Maintenance					
<b>9.2.2</b>	<b>Scheduled Monitoring</b>						
9.2.2.1	The TSI shall verify monthly that every component in the Lane and Host systems is functioning properly. District staff participation in this process shall be limited to observation of fundamental functions such as exterior lighting or Beacon activation. The results of this verification shall be reported to the District monthly.	Maintenance					

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9.2.2.2	The TSI shall verify monthly that all Host functions are available and operating properly. The results of this verification shall be reported to the District monthly.	Maintenance					
9.2.2.3	The TSI shall verify daily that all Lane Toll Transactions and images from the previous day have been received by the Host, properly processed, and sent to the RCSC. The results of this verification shall be reported to the District weekly.	Maintenance					
9.2.2.4	The TSI shall verify weekly that all data and images from the previous week have been saved, backed up and stored in the proper location (e.g. Primary and Secondary Zone Controllers, Primary and Secondary Hosts, and Cloud). The TSI shall sample test this data for correctness. The sample size and verification technique shall be included in the SMP. The results of this verification shall be reported to the District weekly.	Maintenance					
9.2.2.5	Once every eight hours, the TSI shall ensure that Transactions are being captured by the System and check the most recent Lane Toll Transaction from each Lane for errors and ensure that it was properly processed, stored, and sent to the Host. Any discovered problems or errors shall be immediately reported to the District and action initiated to correct them.	Maintenance					
9.2.2.6	Once every eight hours, the TSI shall ensure that all license plate images are being captured by the System and check the most recent images from each Lane for errors and ensure that they were properly processed, stored, and sent to the Host. Any discovered problems or errors shall be immediately reported to the District and action initiated to correct them.	Maintenance					
<b>9.2.3</b>	<b>Preventive Maintenance</b>						
9.2.3.1	The TSI shall include in the Maintenance Manual, a comprehensive preventive maintenance schedule that includes daily, weekly, monthly, quarterly and annual preventive maintenance activities and a plan for actively monitoring and reporting on System performance.	Maintenance					
9.2.3.2	Scheduled preventive maintenance shall consist of, but not be limited to, inspecting, testing, calibrating, cleaning, lubricating, adjusting, repairing, and replacing field-installable parts that are approaching unserviceable status, to prevent System failures and extend the useful life of the System. Such maintenance shall be performed in accordance with the equipment manufacturers' recommendations.	Maintenance					

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9.2.3.3	Preventive maintenance schedules are subject to the approval of the Toll Facility Manager. The TSI shall not remove any piece of equipment from service for preventive maintenance during peak operational periods without prior approval of the Toll Facility Manager.	Maintenance					
9.2.3.4	The TSI shall, as part of the preventive maintenance process, based on experience and analysis, develop parameters to be used to identify, in the early stages, potential problems and actions to be taken to mitigate or prevent potential System issues. These parameters shall be included in the SMP.	Maintenance					
9.2.3.5	During the course of the Maintenance Period the TSI shall continually track and analyze equipment failure and degradation rates in order to predict and modify maintenance service schedules. This analysis shall be based on both the manufacturer's data and historical data accumulated during the maintenance period. Initial analysis shall be included in the SMP and any changes to the analysis shall be included in the monthly report and updated in the SMP.	Maintenance					
<b>9.2.4</b>	<b>Alert Response and Corrective Maintenance</b>						
9.2.4.1	The System shall ensure that the TSI is immediately notified of all Alerts	Maintenance					
9.2.4.2	The TSI shall respond to all Alerts and initiate corrective action as required.	Maintenance					
9.2.4.3	The TSI shall perform all on-call corrective maintenance that consists of unscheduled actions necessary to diagnose and correct malfunctions and failures in the System and associated components. Corrective maintenance does not include unanticipated maintenance services that are entirely due to occurrences beyond TSI control (e.g., damage due to traffic accidents).	Maintenance					
9.2.4.4	The TSI shall, as soon as practical, repair, replace, or maintain any part or parts of the System that become unsuitable for continued use to their original specified performance requirements.	Maintenance					
9.2.4.5	The TSI shall provide method and procedures for the District to report problems by phone, email or text and which will generate TSI maintenance logs.	Maintenance					
9.2.4.6	The TSI shall establish a protocol and provide a contact list for escalation of issues by the District in the event of an unforeseen emergency and/or failure to respond by the TSI.	Maintenance					
9.2.4.7	The Integrator shall repair any hardware or software component after a failure has occurred, either as a whole or in part.	Maintenance					
<b>9.2.5</b>	<b>Unanticipated Maintenance</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
9.2.5.1	Maintenance services due to unanticipated events that are entirely beyond the TSI's control shall not be included in the fixed price for maintenance and shall be compensated on a time and materials basis. Unanticipated events to which this section applies include acts of God or of the public enemy, fire, floods, epidemics, labor disputes, severe traffic accidents, or other causes deemed by the District to be beyond the reasonable control of the TSI.	Maintenance					
9.2.5.2	The TSI shall immediately notify the District of the need for such work and request prior written approval to respond to such an occurrence.	Maintenance					
9.2.5.3	The TSI shall then submit a claim to the District to be compensated for this work, based on the hourly rates in the Resource Rate Schedule.	Maintenance					
9.2.5.4	The TSI shall maintain a staff of trained personnel of sufficient quantity and quality to ensure that repairs can be performed 24 hours a day, every day of the year in accordance with response and repair requirements.	Maintenance					
<b>9.2.6</b>	<b>Backup</b>						
9.2.6.1	The TSI shall ensure daily backup all software and data in the Host to a District approved cloud site.	Maintenance					
9.2.6.2	The District shall have unrestricted access to and use of the backup data.	Maintenance					
9.2.6.3	All cloud based backups shall be secure and encrypted.	Maintenance					
<b>9.2.7</b>	<b>Inspect and Verify</b>						
9.2.7.1	The TSI shall schedule and physically inspect and verify correct operation of the System every six months. Inspection shall include third-party support contractors if required and evaluation of mounting hardware to ensure safety.	Maintenance					
9.2.7.2	Following the inspection, the TSI shall develop an inspection report and meet with the District to review.	Maintenance					
9.2.7.3	The inspection report shall be kept on the Host.	Maintenance					
9.2.7.4	The TSI shall indicate in the proposal the anticipated inspection and verification procedures.	Proposal					
<b>9.2.8</b>	<b>Update</b>						
9.2.8.1	The TSI shall continuously update and bring current all documents and manuals related to the System.	Maintenance					
9.2.8.2	The TSI shall continuously update all application software source code to a location agreed to by the TSI and the District.	Maintenance					
<b>9.2.9</b>	<b>Meeting and Reporting</b>						

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9.2.9.1	The TSI shall schedule and conduct weekly status meetings with the District to inform the District of the performance of the System, any problems noted, and solutions. An activity and status report shall be included with the meeting.	Maintenance					
9.2.9.2	The TSI shall submit all written communication related to meetings to the District or other interested parties via e-mail (verbal communications shall be duplicated in e- mail).	Maintenance					
9.2.9.3	The TSI shall develop and make available to the District, reports that provide information on all maintenance activities. The reports shall be in enough detail to be used for performance monitoring and shall be attached with each billing cycle.	Maintenance					
9.2.9.4	The TSI shall provide a Monthly Spare Parts Use Report detailing the use of spare parts for preventive or corrective maintenance; noting the number of repairs or replacements of high value parts and components.	Maintenance					
9.2.9.5	The TSI shall provide a Monthly Work Order History Report detailing the following information: o Histogram showing the time between failures, time to respond and repair, and total number of calls. o All corrective work including but not limited to: • Specific date problem was reported • Log number • Action taken • Date and time of completion • Technician assigned o Open calls and calls exceeding the response time by priority	Maintenance					
9.2.9.6	The TSI shall provide a Monthly Maintenance Activity Status Report containing, at a minimum, a complete statement of work status.	Maintenance					
9.2.9.7	The TSI shall provide a Monthly Actual to Scheduled Maintenance Report comparing actual maintenance to scheduled maintenance for the previous month and listing of maintenance activities scheduled for the upcoming month.	Maintenance					
9.2.9.8	All reports shall be located in the Host reporting database to permit the generation of custom reports based on maintenance data.	Maintenance					
<b>10</b>	<b>SYSTEM DOCUMENTS AND PLANS</b>						
<b>10.1</b>	<b>SYSTEM DOCUMENTS</b>						
<b>10.1.1</b>	<b>System Design Document</b>						
10.1.1.1	the design of the System and details the realization of the entire System including equipment, procedures, operating scenarios, exceptions, schematics, file structure, data element, message structure, integration, and database definition.	Procedural					



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.1.1.2	Each version of the SDD shall be submitted to the District for review and approval, and address the submittal and approval of both overall design as well as individual sections outlined below.	Procedural					
10.1.1.3	<p>The System Design Document (SDD) shall address and explain all areas of the System design, be tied to the requirements traceability matrix (RTM), and fully describe the System, including, but not limited to:</p> <ul style="list-style-type: none"> <li>• System architecture (hardware and software);</li> <li>• Database design (data elements and definitions);</li> <li>• Equipment functions and installations;</li> <li>• Alerts and maintenance management systems;</li> <li>• Data flows from the lanes to the financial and audit reports;</li> <li>• Data processing logic for processing and reporting toll Transactions under different modes and statuses.</li> <li>• System and user interfaces;</li> <li>• User access and security;</li> <li>• Data storage, security and integrity;</li> <li>• Backup and data recovery;</li> <li>• Prototype of financial reports;</li> <li>• Audit application to drill down to transaction details</li> <li>• Audit features to isolate anomalies, equipment malfunction, pinpoint errors, omissions, and other variances;</li> <li>• Transaction data and structure (Lane and Host);</li> <li>• Interfaces with RCSC and other subsystems;</li> <li>• Network, storage and power requirements for ICS, DVAS and the System in general.</li> </ul>	Procedural					
10.1.1.4	The TSI shall submit the SDD in three stages, each of which shall require direct discussion, review and approval by the District. The stages are Preliminary SDD (PSDD), Detailed SDD (DSDD), and Final SDD (FSDD).	Procedural					
10.1.1.5	The TSI shall submit a PSDD document which shall consist the SDD shall consist of a detailed outline of the entire document with references to all required appendix and attachments. Each primary and secondary section of the outline shall include a short (one paragraph) description of the contents of that section.	Procedural					
10.1.1.6	Meetings and discussions to answer questions and clarify issues shall be held as needed to ensure that the SDD will include all necessary information.	Procedural					

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10.1.1.7	<p>Following approval of the PSDD the TSI shall submit the DSDD which shall include but is not limited to the following critical areas:</p> <ul style="list-style-type: none"> <li>• Lane <ul style="list-style-type: none"> <li>• Lane/Host ICD</li> <li>• DVAS Integration</li> <li>• Lane/DVAS Images and ALPR</li> <li>• Vehicle processing in all lanes (exceptions &amp; anomalies)</li> <li>• Data elements captured by the Zone Controller</li> </ul> </li> <li>• Host <ul style="list-style-type: none"> <li>• Transaction Processing;</li> <li>• Administration screens (DVAS, file transfers, stuck Transaction files, carpool hours, toll table, users, etc.)</li> <li>• RCSC ICD</li> <li>• Traffic and Management Reports</li> <li>• Buffered and Isolated Transponder processing</li> <li>• Financial reporting and audit applications</li> <li>• Processing of RCSC Transactions</li> <li>• Dashboards</li> </ul> </li> <li>• General <ul style="list-style-type: none"> <li>• System hardware and architecture</li> <li>• Maintenance screens and Alerts</li> <li>• ORT design</li> <li>• User access and security</li> <li>• Database architecture</li> <li>• Data storage, access and integrity</li> <li>• Backup and disaster recovery</li> <li>• End-to-end Transaction flow</li> <li>• System controls and safeguards</li> </ul> </li> </ul>	Procedural					
10.1.1.8	The TSI shall submit the DSDD for review by the District fifteen (15) business days in advance of the scheduled DSDD review.	Procedural					
10.1.1.9	The TSI shall conduct a detailed DSDD workshop consisting of a series of interactive workshops lead by the TSI with formal presentations to the District on the System design, a walkthrough of critical areas, further clarify requirements, and review or resolve comments on the DSDD.	Procedural					
10.1.1.10	provide final comment resolutions, written description of changes to the design identified during the DSDD workshops, meeting minutes, and any outstanding action items. If the outcome of the DSDD has any impact on the schedule, the TSI shall provide a proposed revised schedule. Upon receipt of this documentation, the District shall determine whether to approve the DSDD. The District may choose to approve the design for key design areas separately.	Procedural					
10.1.1.11	Upon approval of the entire DSDD the TSI may submit the FSDD.	Procedural					

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10.1.1.12	The TSI shall conduct on-line meetings and a final workshop to review and confirm how the FSDD addresses the RTM.	Procedural					
10.1.1.13	Upon approval of the FSDD the TSI shall proceed to the Development Phase	Procedural					
10.1.1.14	Any System development performed by TSI prior to GGB's approval of the entire SDD, shall be done at TSI's risk, unless specific design areas are designated and approved for development in writing by the District.	Procedural					
10.1.1.15	The TSI shall submit an as-built SDD prior to Final System Acceptance.	Procedural					
<b>10.1.2</b>	<b>System User's Manual</b>						
10.1.2.1	The TSI shall develop User Manuals that provide instructions on how and when to use all features and functions of the System.	Procedural					
10.1.2.2	Prior to developing User Manuals, the TSI shall prepare for the District's review and approval, an annotated outline depicting the proposed content for all User Manuals.	Procedural					
10.1.2.3	Standard user manuals for commercial products will be acceptable if they contain sufficient information to service the component equipment.	Procedural					
<b>10.1.3</b>	<b>System Maintenance Manual</b>						
10.1.3.1	The TSI shall deliver the Maintenance Manual to the District for approval at least 60 days prior to Go-Live. The TSI shall provide the Maintenance Manuals in soft copy as well as two copies in three-ring binder format to facilitate updating and integration with the SMP.	Procedural					
10.1.3.2	diagrams, System description narratives and schedule of periodic testing, troubleshooting and maintenance requirements of all System functions (such as file transfers), which encompass hardware and software across the various levels of the System.	Procedural					
10.1.3.3	as necessary in any of the following areas: general description, theory of operation, operator instructions, detailed electrical/electronic logic circuit analysis, mechanical functions, installation, test and trouble-shooting procedures, preventive and corrective maintenance procedures. The Maintenance Manual shall also contain diagrams, schematics, layouts and parts lists required to service each component and circuit board utilized in the System.	Procedural					
10.1.3.4	supplement the SDD in the areas of: third-party maintenance manuals, functional block diagrams, switch settings interconnections, circuit board locations, and power requirements. The manual shall include the brand name, model number, the source of the product including contract information such as telephone number, e-mail address, and sales consultant, and quantity of each item specified. Periodic testing and maintenance requirements shall be specified.	Procedural					

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10.1.3.5	The TSI shall include a software section of the maintenance manual to supplement the SDD in the areas of: file structures, message structures and protocol, third-party software manuals and a configuration and installation guide indicating step-by-step procedures for initializing replacement computers and reinstalling software from a backup copy for each individual computer. The Software Maintenance manual shall include the brand name and version number of each third-party software package utilized in the System.	Procedural					
10.1.3.6	The System maintenance manual shall describe the following System maintenance program components: <ul style="list-style-type: none"> <li>• Preservation policies and performance standards</li> <li>• Maintenance, repair, and preservation approaches and process schematics</li> <li>• Installation and setup plans</li> <li>• Diagnostic hardware and software tools and techniques</li> <li>• Resource requirements, roles, and responsibilities</li> <li>• Schedule of activities, including preventive maintenance activities such as scheduled inspection, renewal or replacement, and testing of on-site and off-site System components</li> <li>• Quality control/assurance procedures.</li> <li>• Maintenance management including the handling of Alerts, work orders, reports, inventory, scheduled preventative maintenance, scheduled monitoring, and monitoring results.</li> </ul>	Procedural					
<b>10.2</b>	<b>PROJECT PLANS</b>						
<b>10.2.1</b>	<b>Installation Plan</b>						
10.2.1.1	The TSI shall prepare and submit a detailed Installation Plan sixty (60) days prior to the start of installation, that addresses System installation at both a System-wide level and a Lane level.	Procedural					
10.2.1.2	The Installation Plan shall address, but not be limited to the following: <ul style="list-style-type: none"> <li>• Duties and responsibilities of all parties</li> <li>• Detailed installation sequencing and procedures</li> <li>• Coordination of testing activities during transition</li> <li>• System interfaces</li> <li>• Safety planning addressing customers, client, and contractors</li> <li>• Lane closure preparation and procedures</li> <li>• Specification of the space, network and power requirements</li> </ul>	Procedural					
10.2.1.3	The Installation Plan shall outline all steps necessary to obtain approvals for installation of the System.	Procedural					
10.2.1.4	The TSI shall maintain a punch list during installation for review with the District Project Manager on a weekly basis.	Procedural					
10.2.1.5	The District, Caltrans and/or their designee shall have access and time to inspect all aspects of installation.	Procedural					
<b>10.2.2</b>	<b>Transition Plan</b>						

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10.2.2.1	The TSI shall prepare and submit a detailed Transition Plan 30 days prior to the start of transition, that addresses all testing, training, and performance verification procedures.	Procedural					
10.2.2.2	The Transition Plan shall include a Training Plan, Production Readiness Test Plan, and Cutover Plan.	Procedural					
<b>10.2.3</b>	<b>Data Migration Plan</b>						
10.2.3.1	The TSI shall migrate current system data to the System. The details of what data will be migrated will be developed during the System Design Phase.	Functional					
10.2.3.2	The migration of data shall take into consideration data elements that exist in the System but not in the current system and shall properly populate those data elements to allow all System screens and reports to function properly.	Functional					
10.2.3.3	The TSI shall develop a comprehensive Data Migration Plan detailing the TSI's overall approach to the migration of data from the current system to the System. The Data Migration Plan shall define what data is moved, where it is moved from, where it is moved to, how it is moved, when it is moved, and approximately how long the move shall take.	Functional					
10.2.3.4	The Data Migration Plan shall contain a detailed mapping of current system tables and fields to the tables and fields in the System. This mapping shall clearly define any data transformations that shall be required, any data summarizations that shall be performed, and any other data manipulations which may be required to complete the migration. It shall also clearly define what data will not be migrated and why. The mapping shall also define the data migration sequence - which tables must be migrated in which order to ensure data integrity.	Functional					
10.2.3.5	The Data Migration Plan shall provide a conceptual and procedural overview of the actual data migration process including descriptions of the overall method. Key assumptions, external dependencies, and risks associated with the proposed migration process shall be documented.	Functional					
10.2.3.6	The Data Migration Plan shall provide a detailed migration timeline showing each step in the migration process, responsible parties, expected durations, data validation points, etc.	Functional					
10.2.3.7	The Data Migration Plan shall contain a section with migration data validation procedures, queries, reports, and any other tools necessary to demonstrate that the migration was completed successfully. The validation tools shall clearly highlight unexpected results and exceptions. Included in this section shall be rollback procedures in the event that the migration must be aborted.	Functional					

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<b>10.2.4</b>	<b>Training Plan</b>						
10.2.4.1	The TSI shall be responsible for District training in the areas of operations, database design, and maintenance.	Procedural					
10.2.4.2	The TSI shall prepare and submit for District review, comment, and approval a Training Plan with a supportive training delivery schedule.	Procedural					
10.2.4.3	The TSI shall be responsible for providing all materials required to conduct the training.	Procedural					
10.2.4.4	Training shall be provided by professional, qualified trainers supported by appropriate technical experts.	Procedural					
<b>10.2.5</b>	<b>Cutover Plan</b>						
10.2.5.1	The TSI shall develop a cutover plan to ensure a seamless transition from the current system to the new System at one point in time.	Procedural					
10.2.5.2	The TSI cutover plan shall ensure that the RCSC data exchange is in accordance with the accepted RCSC ICD.	Procedural					
10.2.5.3	The TSI cutover plan shall ensure that the System is cleared of all test data and all control files and users are established at the time of cutover.	Procedural					
10.2.5.4	The TSI cutover plan shall incorporate the concept that the current system shall continue operating with the exception of RCSC file transfer.	Procedural					
10.2.5.5	The TSI cutover plan shall address the responsibilities of all System users and fall back to the current system if necessary.	Procedural					
<b>10.2.6</b>	<b>System Maintenance Plan</b>						
10.2.6.1	The TSI shall submit an outline of the System Maintenance Plan (SMP) in the Proposal.	Proposal					
10.2.6.2	The Preliminary System Maintenance Plan shall include the following information at a minimum: <ul style="list-style-type: none"> <li>• Proposed Maintenance Manager</li> <li>• List of maintenance staff positions including capabilities and availability</li> <li>• Monitoring and Alert response plan</li> <li>• Remote access and controls</li> <li>• Periodic operational checks</li> <li>• District training areas</li> <li>• Local test facilities</li> <li>• Device and computer failover controls</li> </ul>	Procedural					
10.2.6.3	The TSI shall develop and institute a System Maintenance Plan for the System. The SMP shall be submitted to the District for approval in modifiable MS Word to format facilitate commenting and updating. The submission date shall be no later than 90 days prior to the scheduled start of installation.	Procedural					

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10.2.6.4	The SMP shall define the policies, roles, responsibilities, schedule of activities, and resources, including third-party equipment and software vendors, for maintaining the System software and hardware at the lane, and Host levels.	Procedural					
10.2.6.5	The SMP shall describe how the TSI will maintain a hardware/equipment inventory.	Procedural					
10.2.6.6	The SMP shall include current descriptive inventory of all System software, source code, and changes to the software on a System wide basis.	Procedural					
10.2.6.7	The SMP shall include an annual condition assessment of System components, with an emphasis on critical components whose failures would lead to major disruptions in System functionality and performance. The assessment shall include a product availability report including any manufacturer end-of-life/end-of- product support timeline and/or migration plans to a newer supported product line in order to keep all components in the system supportable, repairable, and available.	Procedural					
10.2.6.8	The SMP shall describe scheduled and random quality control and assurance testing of System components as well as overall System performance.	Procedural					
10.2.6.9	The SMP shall include procedures for developing and updating preventive maintenance schedules to ensure preventive maintenance occurs outside of the peak travel periods;	Procedural					
10.2.6.10	The SMP shall include the response in dealing with contingencies such as emergency maintenance, sick employees, or vehicular crashes at or near tolling equipment or the Host;	Procedural					
10.2.6.11	The TSI shall update all relevant documentation when making changes to the System.	Procedural					
10.2.6.12	Documentation in support of maintenance shall include final as-builts in modifiable CAD format.	Procedural					
<b>10.2.7</b>	<b>Business Continuity Plan</b>						
10.2.7.1	The Proposer shall provide a comprehensive Business Continuity plan in their Proposal.	Procedural					
10.2.7.2	The Proposer's Business Continuity Plan shall detail potential risks and threats to System operations.	Procedural					
10.2.7.3	The Proposer's Business Continuity Plan shall detail recovery strategies for each potential risk and threat to System operations, and shall describe how the proposed System design and staffing will accomplish the required RPO and RTO in each case.	Procedural					
10.2.7.4	The Proposer's Business Continuity Plan shall include a detailed description of the Proposer's approach to data recovery testing.	Procedural					

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10.2.7.5	The Proposer's Business Continuity Plan shall propose a detailed schedule of data recovery testing exercises.	Procedural					
<b>10.3</b>	<b>TEST PLANS</b>						
<b>10.3.1</b>	<b>Factory Acceptance Test (FAT) Plan</b>						
10.3.1.1	The TSI shall conduct a Factory Acceptance Test to verify that the System functionality is present and all approved System requirements and designs have been satisfied before equipment is shipped and installed on site.	Procedural					
10.3.1.2	The TSI shall prepare and provide a FAT Plan as in accordance the testing requirements.	Procedural					
10.3.1.3	The FAT Plan shall clearly list requirements that the TSI will not test at this stage and the reason for their exclusion. These excluded requirements shall be subject to District review and approval. The TSI shall ensure that each requirement that is not excluded is tested and certified compliant by the District.	Procedural					
10.3.1.4	The FAT shall be conducted at the TSI's facility or a facility mutually agreeable to the District and the TSI, which has been pre-approved by the District for adequacy and suitability. The FAT shall be conducted at a location in the continental United States.	Procedural					
10.3.1.5	The FAT site infrastructure, environment, size, and composition shall be capable of demonstrating the operation of the System within the full operating range under which the production System is expected to perform as defined herein. Any exceptions to this shall be requested by the TSI, in writing, as soon as the deviation(s) are known by the TSI, but no fewer than 60 days in advance of the planned testing dates. Any and all exceptions shall require District approval.	Procedural					
10.3.1.6	The FAT shall follow a set of Transactions through various use cases that demonstrate the work flow and functionality of various subsystems and processes.	Procedural					
10.3.1.7	The TSI shall perform each test as described in the FAT Plan in its entirety with the use of the System equipment and components as specified in the design.	Procedural					
10.3.1.8	At least one unit of every hardware and software component furnished, as part of the System, shall be fully integrated as part of the FAT.	Procedural					
10.3.1.9	The FAT shall include the testing of switchable and non-switchable transponders of both Title-21 and 6C protocols.	Procedural					
10.3.1.10	The TSI shall demonstrate that the hardware and software included in the FAT is a fully integrated System and is capable of operating end-to-end.	Procedural					



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10.3.1.11	FAT shall include a stress test to demonstrate that the System meets the performance requirements when operating under peak conditions. District approved simulated inputs and tools may be used to demonstrate that the full processing load can be achieved including database sizing.	Procedural					
10.3.1.12	Validation and testing of reports shall be performed during the FAT including running predefined reports and creating ad hoc reports.	Procedural					
<b>10.3.2</b>	<b>CSC Integration Test (CIT) Plan</b>						
10.3.2.1	The TSI shall develop the exact form of RCSC transponder status and Transaction files (AET and IBT) for both required protocols and the expected response files.	Procedural					
10.3.2.2	The TSI shall conduct test file transfers with the RCSC	Procedural					
10.3.2.3	In parallel with the rest of the System Design and Development Phases, the TSI shall interface with the RCSC using simulated files to verify the correct receipt, processing, posting, and reconciliation of all Transaction types and content.	Procedural					
<b>10.3.3</b>	<b>Gantry Equipment Field Test (GEFT) Plan</b>						
10.3.3.1	Following installation of the Gantry, equipment on the Gantry, zone controller equipment and Host equipment, TSI shall allow a maximum of 4 weeks for a Gantry Equipment/zone controller/Host Field Test.	Procedural					
10.3.3.2	GEFT shall include testing: <ul style="list-style-type: none"> <li>• Gantry Equipment</li> <li>• Zone Controllers</li> <li>• Host</li> <li>• All components integrated together</li> </ul>	Procedural					
<b>10.3.4</b>	<b>Production Readiness Test (PRT) Plan</b>						
10.3.4.1	The TSI shall conduct a Production Readiness Test (PRT) for a minimum of 30 days prior to Go-Live.	Procedural					
10.3.4.2	The TSI shall conduct the PRT without interfering with the current system which will remain in operation throughout the PRT.	Procedural					
10.3.4.3	The TSI shall conduct the PRT utilizing live traffic to ensure correct operation of the entire System.	Procedural					
10.3.4.4	The TSI shall ensure that the PRT exercises all functions of the System. Interaction with the RCSC shall be controlled to ensure that test Transactions do not interfere with actual toll Transactions.	Procedural					
10.3.4.5	The TSI shall compare the Transactions from the System to the Transactions from the current system as part of the accuracy and performance measurement processes.	Procedural					
10.3.4.6	Acceptance of the PRT shall require that the System meet all availability, accuracy, and performance requirements.	Procedural					

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AETS System Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.3.4.7	At the completion of the PRT the System, Lane and Host, shall be cleared of all data collected in previous tests.	Procedural					
<b>10.3.5</b>	<b>System Acceptance Test (SAT) Plan</b>						
10.3.5.1	The TSI shall demonstrate full production operation of the System, with live traffic and RCSC processed Transactions.	Procedural					
10.3.5.2	The TSI shall use the SAT to verify that the System is performing to the required standards of availability and accuracy.	Procedural					
10.3.5.3	The TSI shall conduct the SAT for a minimum of 30 days or until it has been demonstrated that the performance of the System is within the required standards.	Procedural					
<b>11</b>	<b>PERFORMANCE REQUIREMENTS</b>						
<b>11.1</b>	<b>PERFORMANCE STANDARDS</b>						
<b>11.1.1</b>	<b>General</b>						
11.1.1.1	The Proposer shall provide a detailed description of the proposed System's performance capabilities and how the System shall address the requirements in this section.	Proposal					
11.1.1.2	The Proposer shall demonstrate that the proposed solution has operated with proven functionality in a tolling environment similar to that of the District and is achieving performance similar to that required herein.	Proposal					
11.1.1.3	The System shall achieve the required performance levels under traffic conditions typically experienced at the Golden Gate Bridge, including but not limited to stop-and-go, bumper-to-bumper traffic to vehicles traveling at up to 100 miles per hour. While the District does not typically expect speeds up to 100 miles per hour, the District requires a System that can perform at such speeds.	Performance					
11.1.1.4	The System shall maintain the required performance levels 24 hours a day, seven days a week, regardless of ambient lighting conditions.	Performance					
<b>11.1.2</b>	<b>Availability</b>						
11.1.2.1	Lane - The Lane system shall be designed and maintained to be 100% available and operated 24 hours per day and seven days per week.	Functional					
11.1.2.2	A toll lane is defined as the region under the gantry striped to align traffic for optimum toll collection.	Informational					
11.1.2.3	Lane - A toll Lane shall be designated as unavailable when it is unable to produce correct AVI or IBT Toll Transactions.	Performance					
11.1.2.4	Lane – The TSI shall record Lane unavailable times in the Host database.	Functional					
11.1.2.5	Host - The Host level system shall be designed and maintained to operate 24 hours per day and seven days per week at an availability rate of 96% per day.	Performance					

MassDOT AET - 607579  
AETS System Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
11.1.2.6	Host - The Host shall be designated as unavailable when it is unable to perform one or more of its designated functions.	Performance					
11.1.2.7	Host – The TSI shall record all Host unavailable times, including the allowable 4% in the Host database.	Functional					
<b>11.1.3</b>	<b>Transaction Accuracy</b>						
11.1.3.1	A Toll Transaction is either correct or it is not. Consequently, there can be no more than one "Transaction Error" per Toll Transaction regardless of the number of incorrect fields in the Toll Transaction itself.	Informational					
11.1.3.2	The System shall be designed and maintained to produce and deliver, on time to the RCSC, one and only one correct Toll Transaction per vehicle for 99.5% of all vehicles passing through the tolling zone.	Performance					
11.1.3.3	<p>A correct Toll Transaction will contain, at a minimum, the following information:</p> <ul style="list-style-type: none"> <li>• Correct Transaction ID</li> <li>• Correct Transaction Type</li> <li>• Correct vehicle entry date and time</li> <li>• Correct vehicle exit date and time</li> <li>• Correct Protocol Indicator</li> <li>• Correct Transponder Data</li> <li>• Correct AVC vehicle parameters (height, width, profile, etc.)</li> <li>• Correct vehicle speed</li> <li>• Correct lane</li> <li>• Correct Lane Health indicator</li> <li>• Correct usable front plate image</li> <li>• Correct usable rear plate image</li> <li>• Correct Vehicle Class (primary and secondary)</li> <li>• Correct Transponder Status</li> <li>• Correct* fare</li> <li>• Correct** ALPR(s) and Confidence Level(s)</li> </ul> <p>The TSI shall record, to the extent possible each occurrence in which any of the above is not correct.</p> <p>* This may be done at the Host level.</p> <p>** A correct ALPR and Confidence Level in this case shall mean correct association of that information with the license plate(s) for the IBT</p>	Performance					
11.1.3.4	The TSI shall automatically record, to the extent possible, a single "Transaction Error" for any Toll Transaction in which the required Transaction information is not correct or missing.	Functional					
11.1.3.5	The TSI shall categorize, date and log each incorrect event and corresponding Transaction ID.	Functional					
11.1.3.6	The TSI shall summarize incorrect events for reporting and viewing purposes.	Functional					

MassDOT AET - 607579  
AETS System Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
<b>11.1.4</b>	<b>Transaction Processing and Reporting Accuracy</b>						
11.1.4.1	The System shall transmit all Toll Transactions to the RCSC within 24 hours of their occurrence in the Lane.	Performance					
11.1.4.2	The System shall produce accurate and scheduled revenue reports on all Toll Transactions and CSC reconciliation activity.	Performance					
<b>11.1.5</b>	<b>ALPR Accuracy</b>						
11.1.5.1	ALPR Accuracy requirements shall apply to Image Based Tolls (IBT) only.	Informational					
11.1.5.2	The System shall produce Confidence Levels such that a Confidence Threshold may be established wherein the ALPR Yield shall be at least 50% with an ALPR Error Rate of no more than 0.1%.	Performance					
11.1.5.3	The TSI shall calculate the ALPR Yield as follows: Number of usable images with Confidence Level >= Confidence Threshold / Number of usable images	Functional					
11.1.5.4	An ALPR Error is defined as an incorrect ALPR plate number and/or state with a Confidence Level >= Confidence Threshold.	Informational					
11.1.5.5	The TSI shall calculate the ALPR Error Rate as follows: Number of usable images with Confidence Level >= Confidence Threshold and incorrect Plate Data / Number of Usable Image Sets with Confidence Level >= Confidence Threshold	Functional					
11.1.5.6	The TSI shall calculate the ALPR Yield and ALPR False Positive Rate monthly using all images collected for IBT Transactions over the entire month.	Functional					
<b>11.1.6</b>	<b>Response Time</b>						
11.1.6.1	Response Time is defined as the time between the generation of an Alert (automatic or manual) and the acknowledgement of the Alert by a TSI manager or technician assigned to the project.	Informational					
11.1.6.2	The TSI shall meet response and repair times for corrective maintenance according to the issue as defined below.	Performance					
11.1.6.3	Service requests by persons (i.e., not automatic) shall be acknowledged in kind (e.g. phone, e-mail, text, etc.).	Performance					
11.1.6.4	Priority 1 Alerts - Instances that put revenue collection at risk. The TSI shall respond to and repair Priority 1 issues within 2 hours.	Performance					
11.1.6.5	Priority 2 Alerts - All other failures. The TSI shall respond to and repair Priority 2 issues within 24 hours.	Performance					

3. **SUBMITTAL OF PROPOSALS**

A. **Mandatory Pre-Proposal Conference and Site Tour**

There shall be a mandatory Pre-Proposal Conference and Site Tour prior to the Proposal submission deadline. District staff will be available to answer general questions pertaining to the Request for Proposals (RFP) and the specifications. Any questions that may require staff research to answer or that will otherwise modify the meaning or intent of this RFP shall be submitted to the District in writing as described in Section B below. The Pre-Proposal Conference will be held on **Thursday, November 3, 2016, at 1:00 p.m., Pacific Time, in the Committee Room at the Administration Building, Golden Gate Bridge Toll Plaza, San Francisco, CA.** Immediately following the Pre-Proposal Conference, District staff will conduct the Site Tour.

B. **Requests for Modifications or Clarifications of the Proposal Specifications**

Any requests for modifications or clarifications of the Proposal specifications shall be submitted in writing to the Contracts Office at [contractsoffice@goldengate.org](mailto:contractsoffice@goldengate.org) by **Tuesday, November 8, 2016, at 4:30 p.m., Pacific Time.** Any interpretation, change, or correction of said specifications will be made by Addenda only, duly issued by the Contracts Office no later than **Friday, November 18, 2016.** Proposers should check the District's website at <http://www.goldengate.org> and click on Contract Opportunities for any Addenda that may be issued relative to this RFP. Copies of such Addenda will be mailed or otherwise furnished to each firm receiving a set of specifications. All oral modifications of these conditions or specifications are void and ineffective. The District reserves the right to reject any Proposal that contains unauthorized conditions or exceptions.

C. **Proposal Due Date**

Proposers are requested to submit eight (8) flash drives or thumb drives, containing the Proposal to the District. The Requirements Traceability Matrix and Price Proposal shall be submitted in Excel format in addition to the PDF copy of the Proposal. Proposals should be submitted in a sealed envelope marked, **"REQUEST FOR PROPOSALS (RFP) NO. 2017-B-04, REPLACEMENT TOLL COLLECTION SYSTEM,"** and plainly endorsed with Proposer's name and address. Proposals shall be sent by courier or personal delivery to the following address:

Golden Gate Bridge, Highway and Transportation District  
Administration Building  
Golden Gate Bridge Toll Plaza  
San Francisco, CA **94129**  
**Attention: Amorette M. Ko-Wong, Secretary of the District**

Proposals must be received no later than **Tuesday, December 6, 2016, by 4:00 p.m., Pacific Time**. Proposals received after the time and date specified will not be considered. The District is not responsible for deliveries delayed for any reason. The time received in the Office of the Secretary of the District shall determine the official time received. Submission of a Proposal shall constitute a firm offer to the District for one hundred eighty (180) calendar days from the submission deadline for Proposals.

Each Proposal Form must be signed by one or more individuals with authority to bind the Proposer to the Proposal. All Proposals without the appropriate signature(s) may be deemed non-responsive and may result in the rejection of the Proposal.

District staff will review all Proposals received and several finalists may be selected. These finalists may be invited to an oral interview. Please reserve the week of **December 19, 2016**, as the tentative week planned for finalist interviews, should interviews be conducted. It is requested that the attendees be restricted to those individuals who will have direct involvement with the proposed services.

**D. Proposal Forms and Sample Documents**

The following documents are included in this RFP. Appendix A, *Requirements Traceability Matrix*, of Attachment A, and Attachments B, C, E, F and G must be completed and submitted with the Proposal.

Attachment A	Scope of Work and Appendices
Attachment B	Price Proposal Form and Instructions
Attachment C	Sample Certificate of Insurance
Attachment D	Sample Agreement
Attachment E	Acknowledgment of Addenda
Attachment F	Prime <i>Contractor</i> and Subcontractor/Subconsultant/Supplier Report
Attachment G	Description of Selection Process of Subcontractors/Subconsultants/Suppliers
Attachment H	Performance Bond Form

**4. DESCRIPTION OF DISTRICT**

The Golden Gate Bridge, Highway and Transportation District is a California Special District created by the Legislature in 1923 and subject to regulation under the Bridge and Highway District Act, as amended (see California Streets & Highways Code Section 27000 et seq.). The District is governed by a 19-member board composed of members representing the City and County of San Francisco, Marin County, Sonoma County, Napa County, Mendocino County and Del Norte County.

The District encourages Proposers to be as concise and direct as possible in their response to the RFP. Therefore, the District suggests a combined 75-page limit (~~single-sided only~~), except as noted in this RFP. ***Proposals are not strictly limited to 75 pages as this is a number suggested by the District as a reasonable number of pages for the technical response. It is not a hard limit on the number of pages for the proposal.*** Only the following sections shall count towards the page limit:

- A. Cover Letter
- B. Firm and Staff Experience and Capabilities
- C. Technical Proposal Overview
- D. Technical Proposal Details
- E. Maintenance
- F. System Documentation and Plans

The following, if included, will not count toward the page limit:

- Cover Sheet
- Table of Contents
- ~~Tabbed Dividers~~
- All sections following Section F below
- ***Project Schedule per RFP Section 7, Proposal Content, Sub-Section F***
- ***Alerts per SOW Section 6.6.2.1***
- ***Quality Management Plan per SOW Section 2.1.7.2***
- ***System Maintenance Plan Outline per SOW Section 10.2.6.1***

Proposals shall include page numbers, number of total pages, and identity of the Proposer in the page footer of each page of the Proposal.

A. **Cover Letter** - The signed cover letter should be on company letterhead clearly stating the firm name of the Proposer, business address, telephone and facsimile numbers, and e-mail address. The following information should be provided:

- Introduce the firm and summarize its qualifications.
- Contact Person: The proposer shall provide the name and title, address, telephone number, fax number and e-mail address of the contact person for the proposal evaluation period.
- A statement that binds the Proposer to the proposed SOW and price proposal for one hundred eighty (180) calendar days from the proposal due date.
- Confirm acceptance of or indicate exceptions to the Sample Agreement. See Subsection 11.B.
- Indicate whether there are any conflicts of interest that would limit the Proposer's ability to provide the requested services. See Section 13.
- Provide any required disclosures pursuant to the Levine Act. See Section 14.
- Subcontractors: The proposer shall designate each entity that is proposed to perform work or render services pursuant to a subcontract, detailing the extent of subcontracting contemplated.
- Confirmation that the Proposer meets each of the Minimum Qualifications set forth in Section 6, above. Each of the minimum requirements shall be confirmed separately.
- Signing of Proposals: The Cover Letter must be signed by a

- **Technical Approach (Total of 30 points)**. The total score will be based on an overall assessment of the technology, methodology, and risk as offered by the Proposer to meet District requirements of functionality, delivery, and performance. The District will scrutinize all areas including, but not limited to, the following:
  - (1) Gantry Infrastructure Coordination - Contractors will be evaluated on their technical approach of the AETS infrastructure itself, the gantry equipment design/location, mounting requirements, and supporting civil infrastructure needs as required in Section 4 of the SOW.
  - (2) Open Road All Electric System Vision and Approach – The evaluation will consider the Proposer’s understanding and approach, both technical and management, to the overall system concept and needs of the District as outlined in Sections 1, 2, and 3 of the SOW.
  - (3) Open Road All Electronic Tolling System Details - This section of the Proposer’s response will be evaluated on how the Contractor will address the requirements of Sections 5 - 8, of the SOW.
  - (4) Transition - Proposers will be evaluated on their response to conducting the critical Transition Phase which includes Production Readiness Testing, Data Migration, Training, and seamless Cutover to the new System.
- **System Maintenance Services (10 Points)**. Proposers will be evaluated on their technical and staffing approach to meet the RFP requirements in providing the five (5) year System Maintenance services as described in Section 9 of the SOW.
- **Total Cost of Price Proposal (30 Points)**. The price proposal’s score will be calculated based on the ***Grand Total Proposal Price for the seven lane solution*** shown on the Price Proposal spreadsheet. This price is the sum of the System price, the Five-Year Maintenance price, and the optional Three-Year Maintenance Extension price, as submitted by the Proposer on Attachment B, Price Proposal Form. A Proposer’s failure to submit a completed Price Proposal may result in the District’s determination that the proposal is non-responsive.

The District may reject any Proposal in which the technical approach, qualifications, or costs are not deemed to be within an acceptable or competitive range. The District may seek clarifications or additional information from any or all Proposers regarding their Proposals and may request modified Proposals or best and final offers.

Following the initial review and screening of the written Proposals, using the Selection Criteria described above, one or more companies *may* be invited to participate in the final selection process, which may include:



Pursuant to 49 CFR §26.13 and as a material term of any agreement with the District, the Contractor hereby makes the following assurance and agrees to include this assurance in any agreements it makes with Subcontractors in the performance of this Contract:

The Contractor or Subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of U.S. DOT-assisted contracts. Further, the Contractor agrees to comply with all provisions prohibiting discrimination on the basis of race, color, or national origin of Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. §§ 2000d *et seq.*, and with U.S. DOT regulations, "Nondiscrimination in Federally-Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act," 49 C.F.R. Part 21. The Contractor shall obtain the same assurances from its joint venture partners, subcontractors, and subconsultants by including this assurance in all subcontracts entered into under this Contract. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the District deems appropriate.

By submitting a proposal, the Contractor is deemed to have made the foregoing assurance and to be bound by its terms.

For DBE questions or assistance, contact Artemise Davenport, DBE Program Analyst, at (415) 257-4581.

#### **ATTACHMENTS:**

- Attachment A: Scope of Work and Appendices
- Attachment B: Price Proposal Form and Instructions
- Attachment C: Sample Certificate of Insurance
- Attachment D: Sample Agreement
- Attachment E: Acknowledgment of Addenda
- Attachment F: Prime ***Contractor*** and Subcontractor/Subconsultant/Supplier Report
- Attachment G: Description of Selection Process of Subcontractors/Subconsultants/Suppliers
- Attachment H: Performance Bond Form

#### 4. SCOPE OF SERVICES

4.1 The Scope of Contractor's services includes those set forth in the RFP, Exhibit A, as supplemented by Contractor's final proposal, Exhibit B.

#### 5. TERM

5.1 The Term of this Agreement will commence on the Effective Date. Contractor will begin work upon District issuance of a Notice to Proceed and will proceed according to the Project Schedule set forth in SOW Section 2.1.6. The Contractor may not alter the Project Schedule without District written approval. Contractor must achieve Go-Live no later than December 28, 2018. Unless terminated sooner pursuant to Section 29, the term of this Agreement also includes a five-year maintenance period, commencing upon Go-Live, with three optional one-year extension terms to be exercised by the District in its sole discretion. The one-year extension terms are automatic and the District will notify Contractor at least 60 days prior to the expiration of the base term, or extension term, if it does not want to exercise the option for the following year.

#### 6. COMPENSATION

6.1 Implementation Compensation. For all Work up to and including Final Acceptance, the District will pay the Contractor the fixed price of \$ \_\_\_\_\_. The fixed price is all-inclusive of costs and expenses including but not limited to travel, meals and telephone, and any and all labor, material, software licenses, profit, overhead, insurance, taxes, and subcontractors costs incurred by the Contractor. District will pay the Contractor according to the milestone schedule set forth in the Price Proposal Sheet 2: Implementation Milestone Payment Allocation.

***6.2 The fixed price in Section 6.1 is premised on a seven-lane solution as quoted in Contractor's Price Proposal. The District reserves the right, in its sole discretion, to direct the Contractor to implement a five-lane or six-lane solution instead of the seven-lane solution. If the District determines to provide such direction, it must provide written notice to Contractor no later than the deadline for Deliverable 2.2, Gantry Details Drawings (currently scheduled for June 29, 2017), as specified in Appendix B of the SOW, Milestone Schedule. The pricing set forth in Contractor's Price Proposal for a five-lane or six-lane solution will apply so long as the District provides notice in accordance with this paragraph.***

6.3 Maintenance Compensation For the maintenance services that commence upon Go-Live, the District will pay the Contractor the fixed monthly amount of \$ \_\_\_\_\_. This amount is all inclusive of costs and expenses including but not limited to travel, meals and telephone, and any and all labor, material, third-party maintenance and support agreements, profit, overhead, insurance, taxes and all subcontractor costs.

6.4 Performance Assessments During the Maintenance Period. The District requires a system that performs at a high level of accuracy and availability. The cost of the System, and the monthly maintenance payments, are in recognition of the requirement and expectation of high performance requirements. To the extent that, at any time after Go-Live, the System does not meet the performance requirements set forth in Section 11 of the SOW, the District will not have received the benefit of the bargain of this Agreement and in addition will suffer damages that may be difficult to determine with precision at the time of contracting. The Parties therefore agree that the following performance assessments will apply. These assessments are not penalties but are a reflection that diminished System performance will result in the District incurring damages and/or in the District not receiving the benefit of the bargained-for System performance.

6.4.1 Lane Availability. If the Lane system does not meet the Availability requirements set forth in SOW Section 11.1.2, the Contractor will be responsible for the District's lost toll revenues resulting from a failure of the Lane system to meet the Availability requirement. The Parties agree that the District's losses will be calculated as the difference between (a) the average toll revenue normally collected during the period of unavailability during the previous four weeks for the same time of day and day of the week, and (b) actual toll revenues collected during the period of unavailability. For example, if the Lane system is unavailable from 6am-8am on a Monday, the Contractor will reimburse the District the difference between the amount of tolls it actually was able to collect between 6am-8am on that Monday and the average amount of tolls it has collected during the previous four Mondays between 6am-8am.

The District will prepare a quarterly audit demonstrating any periods of Lane system unavailability, and the calculation specified in the preceding paragraph. If the Contractor disagrees with the District's quarterly audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for actual lost toll revenues, or the amount thereof, will be handled pursuant to Section 27. The District may deduct the amount owed by Contractor from any moneys otherwise due the Contractor or if necessary the Contractor will reimburse the District for the amount owed.

6.4.2 Host Availability. If the Host system is unable to perform one or more of the functions to the Availability requirements designated in SOW Section 11.1.2, it is considered unavailable. The District may assess \$1,000 for every hour that the Host system is unavailable over the allowed *weekly* limit. The District will prepare a monthly report showing any time the host system is unavailable and will deduct the assessment from the monthly maintenance payment otherwise due. Any amount owed in excess of the monthly maintenance payment will be carried over to the next month. If the Contractor disagrees with the District's audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27.

6.4.3 Transaction Accuracy. A transaction is either accurate or not, as specified in SOW Section 11.1.3. A transaction that does not contain all of the information specified in SOW section 11.1.3.3 is inaccurate. For every inaccurate transaction over the allowed error rate, the District may assess an amount equal to the then-current pay-by-plate toll for a two axle vehicle. The District will prepare a quarterly audit showing all transaction inaccuracies in the previous quarter. If the Contractor disagrees with the District's quarterly audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27. The District may deduct the assessment from any moneys otherwise due the Contractor or if necessary the Contractor will reimburse the District for the amount owed.

6.4.4 Transaction Processing. Transactions must be processed in accordance with SOW Section 11.1.4. Any time a transaction (or batch of transactions) is not transmitted to the

RCSC within 48 hours of the transaction occurrence in the Lane, the District may assess \$1,000. The District will prepare a monthly report showing all transactions not processed within 48 hours and will deduct the assessment from the monthly maintenance payment otherwise due. Any amount owed in excess of the monthly maintenance payment will be carried over to the next month. If the Contractor disagrees with the District's audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27.

6.4.5 Automatic License Plate Recognition (ALPR) ALPR accuracy must meet the requirements of SOW 11.1.5. Any time the ALPR accuracy is greater than the allowable 0.1% error rate for images that the System deems acceptable to bypass human review, the District may assess \$10 for each incorrect license plate number (or state) that is greater than the allowable 0.1% error rate. The District will prepare a monthly audit showing all inaccurate license plate reads and will deduct the assessment from the monthly maintenance payment otherwise due. Any amount owed in excess of the monthly maintenance payment will be carried over to the next month. If the Contractor disagrees with the District's audit, it must within ten (10) business days of receipt of the District's audit provide a response detailing the reasons why it should not be held responsible or that the amount is incorrect. Any dispute over responsibility for this assessment, or the amount thereof, will be handled pursuant to Section 27.

6.4.6 All Assessments. In no event will the Contractor be responsible for lost revenues, or other performance assessments, resulting from acts of God or of the public enemy, fire, floods, epidemics, labor disputes, significant traffic incidents ***beyond the reasonable control of the Contractor***, or other causes deemed by the District to be beyond the reasonable control of the Contractor.

## 7. MANNER OF PAYMENT

7.1 Upon satisfactory completion of an implementation milestone set forth in Section 6.1, the Contractor may invoice the District for the amount of the milestone. All invoices must include the Contract number, the milestone description, and a certification that the milestone has been satisfactorily completed. The District shall endeavor to pay all approved invoices within thirty (30) days of their receipt.

7.2 During the maintenance phase, no later than the fifteenth day of each month, the Contractor may submit an invoice for the monthly maintenance and support services costs for the previous month. The District will endeavor to pay all approved invoices within thirty (30) days of their receipt, subject to the performance assessment audit procedures set forth in Section 6.

7.3 Title to Goods. Title to all hardware and any other equipment that is part of the System provided by the Contractor (including any spare equipment) passes to the District upon payment by the District of the invoice for the milestone that includes delivery of applicable equipment.

7.4 Invoices shall be sent via electronic mail to [accountspayable@goldengate.org](mailto:accountspayable@goldengate.org). The District's preferred method of payment is via credit card. The District may issue a Purchase

## 11.6 Source Code and Escrow

The District requires access to all source code to any System software it has licensed. If the Contractor does not provide the District the source code directly, then Contractor agrees that as a condition of Final Acceptance it will deposit, or ensure that a Subcontractor with whom District has directly licensed software has deposited (and provide verification of such deposit as set forth below), the source code for any Software comprising any part of otherwise used in the System (including all updates, versions, releases, and upgrades licensed under this Agreement, as well as any information and tools necessary to allow the escrow agent to verify that the deposited source code matches the Software currently in use by the District) (excluding COTS), into escrow with a source code agent capable of providing certification/verification that the deposited software matches the software currently in use by District in the System.

The initial deposit (or if not deposited into escrow, then direct provision to the District) shall be made promptly after Go-Live as a condition of Final Acceptance. Contractor shall update and maintain source code deposits as necessary—including any and all subsequent fixes, updates, revisions, versions, releases, and upgrades licensed under this Agreement—promptly after any applicable software is fixed, corrected, updated, upgraded, or otherwise modified such that source code in escrow is promptly updated to match the System configuration currently in use by District. All such subsequent deposits into escrow are subject to the same verification requirement set forth herein. Each new deposit will be kept and maintained separately by the escrow agent, with the earlier deposits kept and maintained separately in an archive.

The applicable source code will be released to District (or any contractor acting on its behalf) (a) in the event of nonperformance or the inability of Contractor to timely fulfill any of its obligations regarding the System under this Agreement or any applicable warranties under this Agreement; (b) in the event that Contractor is unable or unwilling to timely assist District with programming, bug-fix, maintenance, or other issues relating to the applicable software at reasonable market prices, even after expiration or termination of this Agreement; (c) in the event any petition of bankruptcy under the Federal Bankruptcy Code is filed by or against Contractor (or a Subcontractor whose Software is subject to this escrow requirement) which is not terminated, dismissed or discharged within sixty (60) days, and neither Contractor nor any successor or affiliated entity is available to work on a commercially reasonable basis to develop modifications or enhancements to the Software reasonably requested by District. In addition, any source code in escrow will be released to the District upon expiration of the fifth year of maintenance services, regardless of whether any of the above release conditions have been satisfied.

Contractor agrees that District (or any contractor acting on its behalf) may use the source code to maintain, fix, or modify the applicable Software as reasonably necessary to operate or maintain any portions of the System. Contractor (or a Subcontractor) and District will separately execute an escrow agreement setting forth the details of the escrow arrangement—though for clarity, to the extent they have not executed such an agreement, that will not relieve Contractor of its escrow obligations under this Section. ***District*** will be responsible for any costs related to the escrow through the term of this Agreement.

13.1.10 Contractor must conduct due diligence on any third-party infrastructure and data security before outsourcing or using remote hosting or similar services that affect District PII;

13.1.11 Contractor, its employees, agents, Subcontractors, and consultants may not download or otherwise store any District PII onto any Contractor computer, desktop, laptop, thumbdrives, disks, or other portable memory device without such data being encrypted.

13.1.12 District will be entitled to conduct reasonable audits of Contractor's data security procedures and measures, on reasonable notice.

~~13.1.13 If Contractor has reason to believe that any District PII may have been accessed without proper authorization while in in the possession or custody of Contractor (or any Subcontractor), Contractor must immediately take such actions as may be necessary to preserve forensic evidence and eliminate the cause of any suspected breach or security vulnerability—and must promptly alert District of any such circumstances, including information sufficient for District to assess the nature and scope of any suspected data breach. To the extent District in its reasonable discretion deems it necessary, under applicable legal requirements, District may provide notice or require Contractor to provide notice to all parties affected by the suspected data breach; and in such case, Contractor will consult with District regarding the appropriate steps for notifying such parties.~~

13.1.13 This Section will survive termination or expiration of this Agreement.

## 13.2 Notice of Security Breach

13.2.1 *If Contractor has reason to believe that any District PII may have been accessed without proper authorization while in in the possession or custody of Contractor (or any Subcontractor), Contractor must immediately take such actions as may be necessary to preserve forensic evidence and eliminate the cause of any suspected breach or security vulnerability—and must promptly alert District of any such circumstances, including information sufficient for District to assess the nature and scope of any suspected data breach. In addition, the Contractor must immediately notify the District when it discovers that there may have been a data security incident that has or may have resulted in compromise to District PII. For purposes of this Section, immediately is defined as within twenty-four hours of discovery. ~~The Contractor must immediately take such actions as may be necessary to preserve forensic evidence and eliminate the cause of any suspected breach or security vulnerability—and must promptly alert the District of any such circumstances, including information sufficient for the District to assess the nature and scope of any suspected data breach.~~* In the event of an unauthorized disclosure of District PII, the Contractor will be liable for paying for the following costs to remediate any such unauthorized disclosure:

13.2.1.1 The reasonable cost of providing notice of the breach to individuals affected by such breach;

13.2.1.2 The reasonable cost of providing required notice of the breach to government agencies, credit bureaus, and/or other required entities;

13.2.1.3 The cost of providing individuals affected by such breach with credit protection services designed to prevent fraud associated with identity theft crimes for a specific period not to exceed 12 months; and

13.2.1.4 Any other service required by applicable law.

13.2.2 The Contractor must provide any information and/or support to the District in issuing the actual notification and, at the District's sole discretion, the Contractor must itself provide actual notification if the District desires; *and in such case, Contractor will consult with District regarding the appropriate steps for notifying such parties.* This Section will survive termination or expiration of this Agreement.

**14. USE OF SUBCONTRACTORS**

The Contractor may not subcontract any services to be performed by it under this Agreement without the prior written approval of District, except for those service firms engaged in drawing, reprographics, typing, and printing. Upon request, Contractor will provide the District with copies of all agreements with Subcontractors. The Contractor will be solely responsible for reimbursing any Subcontractors and District will have no obligation to them. Without limitation to the generality of the foregoing, each such written subcontract will at a minimum contain the following express provisions:

- Contractor, not District, is solely responsible for payment to the Subcontractor for any amounts owing—and the Subcontractor will have no claim, and may take no action against District (or its officers, directors, employees or sureties) for nonpayment by Contractor.
- Subcontractor agrees that the subcontract is subservient to this Agreement and that it will be bound to the applicable terms and conditions of this Agreement.

Consent by District to subcontracting will not relieve the Contractor of its primary responsibility for performance under this Agreement. The Contractor must be responsible for all work, whether subcontracted or purchased from a supplier. The Contractor agrees to pay its Subcontractors all sums owed and will be solely responsible for reimbursing any Subcontractors; District will have no obligation to them.

**15. KEY PERSONNEL**

It is understood and agreed by the Parties that at all times during the term of this Agreement that [INSERT] will serve as the Project Manager of the Contractor and that the following Key Personnel and Support Staff identified in Contractor's proposal or as otherwise approved by District must undertake, render, and oversee all of the Work under this Agreement.

Gantry Coordinator: \_\_\_\_\_

RSCS Coordinator: \_\_\_\_\_

Maintenance Manager: \_\_\_\_\_

[TBD INCLUDE SUPPORT STAFF]

District awarded this Agreement to Contractor based on District's confidence and reliance on the expertise of Contractor's Key Personnel and Support Staff. Contractor may not reassign any Key

## 21. INSURANCE REQUIREMENTS

### A. Types of Insurance

The Contractor shall not commence work until proper evidence of insurance coverage of the types and amounts specified in this section has been provided to the District. The Contractor shall not violate or permit to be violated any conditions or provisions of said policies of insurance, and at all times shall satisfy the requirements of the insurer for the purpose of maintaining said insurance in effect.

If any claim is made by any third person against the Contractor on account of any incident connected to the Agreement, the Contractor shall promptly report the fact in writing to the District, giving full details of the claim.

Any person, firm, or corporation that the Contractor authorizes to work upon the District's property, including any subcontractor, shall be deemed to be the Contractor's agent and shall be subject to all applicable terms of this Agreement. Prior to the Contractor's start of the work or entry onto the District's property, the Contractor agrees to require its subcontractors to procure and maintain, at the Contractor's (or its subcontractor(s)') sole cost and expense (and to prove to the District's reasonable satisfaction that it remains in effect throughout the performance of the work under this Agreement), the kinds of insurance described below. Such insurance must remain in effect throughout the term of this Agreement and will be at the sole cost and expense of the Contractor (or its subcontractor(s)).

#### 1) Commercial General Liability Insurance

The Contractor shall, at its own expense, procure and maintain Commercial General Liability insurance providing bodily injury and property damage coverage with a combined limit of at least *Five Million Dollars (\$5,000,000)* each occurrence and a general aggregate limit of at least *Ten Million Dollars (\$10,000,000)*. This insurance shall include, but not be limited to, premises and operations, contractual liability covering the indemnity provisions contained in this Agreement, personal injury, products and completed operations, and broad form property damage, and include a Cross Liability endorsement.

Said Policy shall protect the Contractor and the District in the same manner as though a separate policy had been issued to each, but nothing in said policy shall operate to increase the insurance company's liability as set forth in its policy beyond the amount or amounts shown or to which the insurance company would have been liable if only one interest had been named as an insured.



2) Business Automobile Liability

The Contractor shall, at its own cost and expense, procure and maintain Business Automobile Liability insurance providing bodily injury and property damage with a combined single limit of at least One Million Dollars (\$1,000,000) per occurrence for all owned, non-owned and hired automobiles. This insurance shall provide contractual liability covering all motor vehicles and mobile equipment to the extent coverage may be excluded from general liability insurance.

3) Workers' Compensation and Employers' Liability Insurance

If the Contractor employs any person to perform work in connection with this Agreement, the Contractor shall procure and maintain at all times during the performance of such work Workers' Compensation Insurance in conformance with the laws of the State of California, and federal laws where applicable. Employers' Liability Insurance shall not be less than One Million Dollars (\$1,000,000) for each accident and One Million Dollars (\$1,000,000) for each disease, with a policy limit of One Million Dollars (\$1,000,000).

The policy shall contain a waiver of subrogation in favor of the District and its officers, directors, employees, volunteers, and agents, while acting in such capacity, and their successors and assignees, as they now or as they may hereafter be constituted, singly, jointly, or severally.

4) Professional Liability Insurance

The Contractor shall also maintain Professional Liability Insurance covering the Contractor's performance under this Agreement with a limit of liability of ***Five Million Dollars (\$5,000,000)*** for any one claim. This insurance shall be applicable to claims arising from the work performed under this Agreement. Prior to commencing work under this Agreement, the Contractor shall furnish to the District a Certificate of Insurance or certified copy of the insurance policy if requested, indicating compliance with the requirements of this paragraph. This certificate or policy shall further stipulate that thirty (30) days' advance written notice of cancellation, non-renewal or reduction in limits shall be given to the District.

5) Cyber Liability Insurance

Such policy shall contain Cyber Liability risk coverages including network and internet security liability coverage, privacy liability coverage and media coverage.

It is the policy of the District to ensure nondiscrimination in the award and administration of all contracts and to create a level playing field on which Disadvantaged Business Enterprises (DBEs) can compete fairly for contracts and subcontracts relating to the District's construction, procurement and professional services activities. To this end, the District has developed procedures to remove barriers to DBE participation in the bidding and award process and to assist DBEs to develop and compete successfully outside of the DBE Program. In connection with the performance of this contract, the Contractor will cooperate with the District in meeting these commitments and objectives. The District reserves the right to require the Contractor to provide additional DBE information.

Pursuant to 49 CFR §26.13, and as a material term of any agreement with the District, the Contractor hereby makes the following assurance and agrees to include this assurance in any agreements it makes with Subcontractors in the performance of this contract:

The **Contractor** shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of U.S. DOT-assisted contracts. Further, the **Contractor** agrees to comply with all provisions prohibiting discrimination on the basis of race, color, or national origin of Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. §§ 2000d *et seq.*, and with U.S. DOT regulations, "Nondiscrimination in Federally-Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act," 49 C.F.R. Part 21. The Contractor shall obtain the same assurances from its joint venture partners, subcontractors, and subconsultants by including this assurance in all subcontracts entered into under this Agreement. Failure by the Contractor to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as the District deems appropriate.

#### **24.1 DBE Eligibility**

A small business concern must be certified as a DBE by any recipient of U.S. DOT funds acceptable to the District in accordance with 49 CFR Part 26. It is the Contractor's responsibility to verify that DBEs are certified.

**A. Disadvantaged Business Enterprise.** A DBE is a for-profit, small business concern:

1. That is at least fifty-one percent (51%) owned by one or *more individuals who are both socially and economically disadvantaged, or, in the case of a corporation, in which fifty-one percent (51%) of the stock is owned by one or more such individuals*; and
2. Whose management and *daily* business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

- B. **Small Business Concern.** A small business concern shall meet the definition and size standards of an existing small business as required by the Small Business Administration pursuant to 13 CFR Part 121, and the firm's annual average gross receipts for the previous three years cannot exceed ***\$23.98 million.***
- C. **Socially and Economically Disadvantaged Individuals.** There is a rebuttable presumption that socially and economically disadvantaged individuals are persons who are citizens or lawful permanent residents of the United States and who are: ***Black*** Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent-Asian Americans, Women, or a member of any additional group that is designated as socially and economically disadvantaged by the Small Business Administration. Additionally, any individual may demonstrate to the certifying agency by a preponderance of evidence, that s/he is socially and economically disadvantaged on a case-by-case basis.

An individual cannot be presumed or determined to be economically disadvantaged if s/he has a personal net worth that exceeds \$1.31 Million, excluding the individual's ownership interest in the DBE firm and the individual's ***equity in her/his primary residence.*** ***Additionally, if an individual is able to accumulate substantial wealth, as defined in 49 CFR 26.67(b)(ii)(A), the individual's presumption of economic disadvantage can be rebutted.***

#### 24.2 **DBE Participation Goal**

- A. **DBE Participation Goal for the Performance of this Contract.** Proposers are strongly encouraged to obtain Disadvantaged Business Enterprise (DBE) participation on this project, although there is no contract-specific DBE goal.
- B. **Available DBE Resources.** Listings of certified DBEs are available from the California Unified Certification Program DBE Directory, which may be obtained by visiting the California Department of Transportation website at [www.dot.ca.gov/hq/bep/find\\_certified.htm](http://www.dot.ca.gov/hq/bep/find_certified.htm) or by contacting the DBE Program Office (Office) at (415) 257-4581.

The DBE Directory does not in any way prequalify the certified firms with respect to licensing, bondability, competence or financial responsibility. The Office also maintains a DBE resource list of organizations that promote DBE participation in contracts, which will be provided upon request.

Contractors are encouraged to use services offered by financial institutions owned and controlled by socially and economically disadvantaged individuals. To obtain a list of these financial institutions, please contact the Office.

### 24.3 Determining the Amount of DBE Participation

Pursuant to 49 CFR §26.55, DBE participation includes that portion of the contract work actually performed by a certified DBE with its own forces. A DBE may participate as a prime contractor, subcontractor, joint venture partner, or vendor or supplier of materials or services required by the contract.

A DBE's participation can only be counted if it performs a commercially useful function on the contract as defined in 49 CFR §26.55(c). A DBE performs a commercially useful function when it actually performs, manages and supervises a portion of the work involved. *A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.* There is a rebuttable presumption that if the DBE is not responsible for at least 30% of the work with its own forces, or subcontracts a greater portion of the work than the normal industry standard, it is not performing a commercially useful function.

### 24.4 Contract Compliance

- A. **Substitution of Subconsultants/Subcontractors/Suppliers.** The Contractor shall notify the District in writing of any request to substitute a DBE subcontractor and provide appropriate documentation substantiating the substitution. The Contractor must make good faith efforts to substitute an original DBE subcontractor with a small business concern. Any substitution of a DBE on this contract is subject to the written approval of the District.

*District may provide such written consent only if it agrees, for reasons stated in District's concurrence document, that Contractor has good cause to terminate the DBE firm. For purposes of this paragraph, good cause includes the following circumstances:*

- *The listed DBE subcontractor fails or refuses to execute a written contract;*
- *The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of Contractor;*
- *The listed DBE subcontractor fails or refuses to meet Contractor's reasonable, nondiscriminatory bond requirements;*
- *The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;*
- *The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1200 or applicable state law;*
- *Contractor has determined that the listed DBE subcontractor is not a responsible contractor;*
- *The listed DBE subcontractor voluntarily withdraws from the Project and provides to Contractor written notice of its withdrawal;*

- *The listed DBE is ineligible to receive DBE credit for the type of work required;*
- *A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the Contract;*
- *Other documented good cause that you determine compels the termination of the DBE subcontractor. Provided, that good cause does not exist if Contractor seeks to terminate a DBE it relied upon to obtain the Contract so that Contractor can self-perform the work for which the DBE contractor was engaged or so that Contractor can substitute another DBE or non-DBE contractor after Contract award.*

*Before transmitting to District Contractor's request to terminate and/or substitute a DBE subcontractor, the Contractor must give notice in writing to the DBE subcontractor, with a copy to District, of intent to request to terminate and/or substitute, and the reason for the request.*

*Contractor must give the DBE (5) five days to respond to Contractor's notice and advise District and Contractor of the reasons, if any, why DBE objects to the proposed termination of its subcontract and why District should not approve Contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), Contractor may provide a response period shorter than (5) five days.*

*In addition to post-award terminations, the provisions of this Section apply to pre-award deletions of or substitutions for DBE firms put forward by offerors in negotiated procurements.*

*Under the circumstances a DBE subcontractor is terminated, or fails to complete its work on the contract for any reason, the Contractor must make good faith efforts to find another DBE subcontractor to substitute for the original DBE.*

- B. DBE Certification Status.** If a DBE Subcontractor is decertified during the life of the project, the decertified Subcontractor shall notify the Contractor in writing with the date of decertification. If a Subcontractor becomes a certified DBE during the life of the project, the Subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Project Manager.
- C. Prompt Payment to Subcontractors.** The Contractor shall pay any Subcontractor approved by the District for work that has been satisfactorily performed no later than *seven (7) days* from the date of the Contractor's receipt of progress payments by the District.

The District shall hold retainage from the Contractor and shall make prompt and regular incremental acceptances of portions of the contract work, as determined by the District, and pay retainage to the Contractor based on these acceptances. The Contractor or Subcontractor shall return all monies withheld in retention from all Subcontractors within 30 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract work by the District. Any delay or postponement of payment may take place only for good cause and with the District's prior written approval.

Any violation of these provisions shall subject the violating Contractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the California Business and Professions Code. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or Subcontractor in the event of a dispute involving late payment, or nonpayment by the Contractor, or deficient subcontractor's performance, or noncompliance by a Subcontractor. This clause applies to both DBE and non-DBE Subcontractors.

In the event the Contractor does not make progress payments or release retentions to the Subcontractors in accordance with the time periods in this section, the Contractor will be subject to a charge of two percent (2%) per month on the untimely or improperly withheld payment.

- D. Reporting Requirements.** The Contractor shall maintain records of all DBE participation in the performance of the contract, including subcontracts entered into with certified DBEs and all materials purchased from certified DBEs.

The Contractor shall complete and submit the Monthly Prompt Payment Report and, if applicable, the Monthly DBE Trucking Verification, in forms to be provided by the District, within fifteen (15) days from the date of Contractor's receipt of progress payments.

The completed Monthly Prompt Payment Report shall provide the name, address, date of payment, and the total dollar amount actually paid to each Subcontractor performing work on the contract.

~~*The completed Monthly DBE Trucking Verification shall provide the amount paid to DBE trucking companies and shall indicate if a lease arrangement exists. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. It shall also show the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month.*~~

If the Contractor fails to submit the Monthly Prompt Payment Report or the Monthly DBE Trucking Verification (if applicable) within the time period required in this section and has not received written approval for an extension, the Contractor will be assessed an administrative deduction of fifty dollars (\$50) each day the report is late.

Upon completion of the contract, the Contractor shall complete and submit the Final Report – Utilization of Disadvantaged Business Enterprises (DBE), in a form to be provided by the District. Final payment will not be processed until the Final Report is submitted and approved by the District.

**Price Proposal Sheet 1: Implementation Costs Itemization**

Line #	Implementation Component	Unit	Quantity	Unit Price (\$) <sup>8</sup>	Total Price (\$)	Notes on assumptions <sup>7</sup>
<b>Project Development</b>						
1	Project Management	Lump Sum	1		\$0.00	
2	Design and Documentation <sup>1</sup>	Lump Sum	1		\$0.00	
3	Installation Costs <sup>2</sup>	Lump Sum	1		\$0.00	
3	Training Materials and Courses	Lump Sum	1		\$0.00	
4	Escrow	Lump Sum	1		\$0.00	
5	Performance Bond	Lump Sum	1		\$0.00	
6	Third Party Support Contracts (List under "Other Items") <sup>3</sup>	Lump Sum	1		\$0.00	
7					\$0.00	
8					\$0.00	
9					\$0.00	
<b>Subtotal - Project Development</b>					<b>\$0</b>	
<b>Lane System <sup>4</sup></b>						
10	Zone Controller Hardware	Toll Zone			\$0.00	
11	Zone Controller Software	Toll Zone			\$0.00	
12	AVI System	Toll Zone	1		\$0.00	
13	AVC System	Toll Zone	1		\$0.00	
14	ICS System	Toll Zone	1		\$0.00	
15	DVAS System	Toll Zone	1		\$0.00	
16	Enforcement Beacon System	Toll Zone	1		\$0.00	
17					\$0.00	
18					\$0.00	
<b>Subtotal - Lane System</b>					<b>\$0</b>	
<b>Host System <sup>4</sup></b>						
19	Host System Hardware	Lump Sum	1		\$0.00	
20	Host System Software	Lump Sum	1		\$0.00	
21					\$0.00	
<b>Subtotal - Host System</b>					<b>\$0</b>	
<b>Network Infrastructure <sup>4</sup></b>						
22	Network Infrastructure Equipment	Lump Sum	1		\$0.00	
23	Network Infrastructure Software and Services	Lump Sum	1		\$0.00	
24					\$0.00	
<b>Subtotal - Network Infrastructure</b>					<b>\$0</b>	
<b>System Testing <sup>5</sup></b>						
25	Factory Acceptance Test	Lump Sum	1		\$0.00	
26	CSC Integration Test	Lump Sum	1		\$0.00	
27	Gantry Equipment Field Test	Lump Sum	1		\$0.00	
28	Production Readiness Test	Lump Sum	1		\$0.00	
29	System Acceptance Test	Lump Sum	1		\$0.00	
<b>Subtotal - System Testing</b>					<b>\$0</b>	
<b>Other Optional Items <sup>6</sup></b>						
30					\$0.00	
31					\$0.00	
32					\$0.00	
33					\$0.00	
34					\$0.00	
35					\$0.00	
<b>Subtotal - Other Optional Items</b>					<b>\$0</b>	
<b>Total RTCS Implementation Cost</b>					<b>\$0</b>	

- Notes:
- Does not include specific test plan documentation. These are included under "system testing."
  - Includes installation of all components. Does not include commissioning (see Note #4)
  - The unit price shall match the sum of the costs of all of the Third Party Support Contracts listed under "Optional Items"
  - Includes all material and labor costs for procuring and commissioning (Installation is separate, see Note #2); software includes licensing and custom development
  - Includes all steps to plan and conduct and document these specific tests
  - Add any items not included in the specified or optional items under the component groups that support the proposed solution. For the third party support items, just list the names, units and quantities. Do not enter Unit Price
  - Note any assumptions that you consider important in justifying your cost
  - Prices assume a configuration of 7 lanes. For different lane configurations (i.e., 5 and 6 lanes), input each representative cost in sheet PS-5 - Total Price

## Price Proposal Sheet 2: Implementation Milestones Payments Allocation

Project Phase and Milestone Name	Payment % of Total Implementation Cost	Milestone Payment Amount (\$)
Phase 1: Definition and Business Rules	6%	\$0
Phase 2: System Design	7%	\$0
Phase 3: System Development	15%	\$0
Phase 4: Installation	35%	\$0
Phase 5: Transition	24%	\$0
Phase 6: System Acceptance	13%	\$0
<b>Total RTCS Implementation Cost</b>		<b>\$0</b>

Notes: This sheet does not provide from any type of input. Percentages are provided by the District and are independent of the itemized costs provided by the Proposer in Sheet PS-1.



### Price Proposal Sheet 3A: Maintenance Payment Schedule

Line #	Maintenance Component	Maintenance Fee Per Month					
<b>Base Contract Maintenance Fees</b>		Year 1	Year 2	Year 3	Year 4	Year 5	<b>Y1-5 Annual Δ %</b>
1	Labor (PS-3B) <sup>1</sup>	\$0	\$0	\$0	\$0	\$0	From PS-4
2	Materials		\$0	\$0	\$0	\$0	
3							
4							
5							
6	Subtotal Per Month	\$0	\$0	\$0	\$0	\$0	
7	# Months per Year <sup>2</sup>	12	12	12	12	12	<b>Total Y1-5</b>
8	Total Per Year <sup>2</sup>	\$0	\$0	\$0	\$0	\$0	<b>Incomplete</b>
<b>Optional Extension Maintenance Fees</b>		Year 6	Year 7	Year 8			<b>Y6-8 Annual Δ %</b>
9	Labor (PS-3B) <sup>1</sup>	\$0	\$0	\$0			
10	Materials		\$0	\$0			
11							
12							
13							
14	Subtotal Per Month	\$0	\$0	\$0			
15	# Months per Year <sup>2</sup>	12	12	12			<b>Total Y6-8</b>
16	Total Per Year <sup>2</sup>	\$0	\$0	\$0			<b>Incomplete</b>

- Notes:
1. Labor populates automatically from Sheet PS-3B.
  2. The number of months per year and total cost per year assumes completion of a contract year during the maintenance period.

### Price Proposal Sheet 3B: Monthly Maintenance Labor Detail

Line #	Staff Position <sup>1</sup>	Base Contract (Maintenance Year 1)			Optional Extension (Maintenance Year 6)		
		Hours/Mo.	Avg. Rate/Hr	Total \$/Mo.	Hours	Avg. Rate/Hr	Total \$/Mo.
1	Maintenance Manager		\$0.00	\$0			
2				\$0			
3				\$0			
4				\$0			
5				\$0			
6				\$0			
7				\$0			
8				\$0			
9				\$0			
10				\$0			
<b>Total Labor per month</b>				<b>\$0</b>			<b>\$0</b>

Notes: 1. Please cut & paste each desired position from the Staff Position column in PS-4 - Labor Rates

**Price Proposal Sheet 4: Proposed Project Staff Labor Rates**

Line #	Staff Name	Staff Position	Loaded Hourly Billing Rates and % Increase by Year - Base Contract Period <sup>1</sup>						
			Imp. Year 1	Imp. Year 2	Maint. Year 1	Maint. Year 2	Maint. Year 3	Maint. Year 4	Maint. Year 5
			% ->		% ->				
<b>Key Staff</b>			Hourly Rates (\$)						
1		Project Manager							
2		Gantry Coordinator							
3		RCSC Coordinator							
4		Maintenance Manager							
<b>Support Staff<sup>2</sup></b>			Hourly Rates (\$)						
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Notes: 1. Please provide base year rates for both the development and the maintenance phases of the base contract period.  
 2. Please include the 6-12 Support Staff as required in the Proposal Instructions

### Price Proposal Sheet 5: Total Price

Line #	Pricing Per # of Lanes	Base Contract Period Cost			Optional Maintenance Contract Extention Periods Cost			
		Development	Maint Years 1-5	Total 5th year <sup>1</sup>	Maint year 6	Maint Year 7	Maint Year 8	Total 8th year <sup>1</sup>
1	Implementation + Maintenance (5 Lanes)			\$0				\$0
2	Implementation + Maintenance (6 lanes)			\$0				\$0
3	Implementation + Maintenance (7 lanes)	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes: 1. Implementation + maintenance costs by end of 5 or 8 year maintenance period starting after go-live.  
Please note that the Price Evaluation will be based on the amount in cell E7 (in orange).

**Proposer is to complete the following columns on the RTM worksheet:**

This Addendum to the RTM shall be completed by the Proposer for all requirements listed. In most cases, clarifications were made for specific Requirements during the Q&A process. In other cases, the Requirement was replaced with new text. Only those Requirements that are affected or modified are included in this Addendum version. Proposers shall submit the original RTM as indicated in the RFP and shall complete and submit this Addendum RTM as separate documents in their Proposal. Note that items in the original RTM modified by this Addendum do not need to be completed, and that for these items, the responses to the Addendum RTM shall take precedence.

The spreadsheet columns on the 'Addendum' tab are defined and shall be completed as follows:

<b>Column</b>	<b>Description</b>
Level	Corresponds to the Table of Contents level of the section/requirement
Requirement Number	Corresponds to the Requirement Number(s) for requirements listed
Requirement	The text of the requirement
Type	The requirement type
Proposer Acknowledges Requirement	For Proposal and Informational Requirements enter "Accepted" if Proposer accepts requirement and can meet it. Enter "Not Accepted" if Proposer does not accept requirement. If not accepted, Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not accept requirement must be entered in the Comments field. NOTE that a response of "Accepted" for Proposal requirements means requirement is addressed in Proposal.
Will be met in execution of SOW?	For Maintenance, Procedural and Performance Requirements enter "Yes" if the requirement will be met during the execution of the Scope of Work (SOW), enter "No" if the Proposer can not meet requirement. If "No" is selected, Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not meet requirement must be entered in the Comments field.
Fully Supported by Existing System ?	Enter "Yes" if the Proposed system for this project fully supports the requirement. Otherwise, enter "No". If "No" (or N/A) is selected the Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not meet requirement or why requirement is N/A, must be entered in the Comments field.
Comments	In the Comments column, enter a brief comment/ explanation addressing how the gap will be filled, or why the requirement will not be fully met.
Proposal Reference	Provide the reference(s) to the section(s) where the Proposal addresses the comment(s).

**Any requirement as set forth in the RFP that is not listed here is still required to be completed.**

Addendum 3

Informational & Proposal Requirements	Maintenance, Procedural and Performance Requirements	Functional Requirements Only
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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)	Addendum Clarification
2.1.2	<b>Gantry Coordinator</b>							
2.1.6.4	The Project Schedule shall provide the District with a 14 day review period for each TSI deliverable.	Procedural						All references to “day” mean calendar day unless otherwise specified.
2.1.7.2	The TSI, in the Proposal, shall submit a Quality Management Plan (QMP) that describes Quality Assurance (QA) and Quality Control (QC) procedures for preparing, verifying and checking all products and performance criteria related to this Project to ensure that they are independently checked and back-checked in accordance with generally accepted practices for these types of services and the requirements of this Scope of Work. <b>The QMP may be submitted as Attachment 3 to the Proposal.</b>	Proposal						
2.2.1.1	The TSI shall facilitate Business Rules and System requirements refinement workshops to review, discuss, refine and finalize the Business Rules and System requirements. These workshops shall include discussion of all functional areas and critical areas.	Procedural						The current business rules are proprietary. Estimates of required work related to business rules of this new system should be based on the information provided in the RFP.

2.2.3.1	The TSI shall establish a location where developed hardware and software can be demonstrated, tested and verified.	Procedural					Test facilities must be sufficiently equipped and configured to verify basic System functionality including anomalies such as cross lane reads. However, it would not be necessary to duplicate all lanes expected at the District location. The TSI shall determine the test facility design that will meet these requirements
2.2.3.2	The TSI shall schedule and conduct informal functional demonstrations throughout the System Development Phase to provide the District insight into the development progress and an opportunity to provide feedback during development.	Procedural					Functional Demonstrations are meant to be similar to construction inspections wherein mistakes or errors are found early before too much work has progressed in a particular area. These demonstrations may occur more or less frequently depending on the results however for planning purposes it is expected that there would be three or four demonstrations either at the TSI site or remotely, lasting about four hours and attended by up to four District representatives.
2.2.4.7	The TSI shall be responsible for conducting routine inspections of all installations and certifying in writing that the Gantry Contractor has completed installation per the approved design documentation and drawings.	Procedural					Any design criteria, reports, submittals, drawings/sketches provided by the TSI do not require Caltrans approval or signed and stamped by a Professional Engineer.

2.2.4.8	As-built drawings shall be submitted within thirty (30) days of the completion of the installation.	Functional						For more information about Gantry requirements, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
2.2.5.15	The TSI shall ensure that all class participants are able to generate queries, generate reports, as requested by the District and add/remove these reports from the System.	Procedural						Reports developed after go-live shall be selectable from the standard Host system interactive interface. The method used to accomplish this shall be determined in the Design phase.
2.2.6	<b>Phase 6 - System Acceptance</b>							For more information about Gantry requirements, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
2.3.2.3	An additional 10 days shall be scheduled by the TSI for documents requiring Caltrans review.	Procedural						Caltrans review and approval are not required for TSI submittals to the District.
2.4	<b>TESTING REQUIREMENTS</b>							The District or its CSC operator provide test accounts and RFID transponders for use during system testing phases
2.4.4.2	The District will be responsible for providing power and communication feeds to the Gantry system.	Informational						See 2.4.4.9. below
2.4.4.4	The TSI shall work with the Gantry Contractor (Section 4) to supervise proper installation of the power and communication lines.	Informational						For more information about Gantry requirements, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
2.4.4.5	The TSI shall install all Host (Section 7.1) related equipment in District specified locations.	Informational						See 2.4.4.9. below



2.4.4.6	The TSI shall provide interconnection of Host components in the same location.	Informational						For more information about Gantry requirements, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
2.4.4.9	The Gantry Designer and Gantry Contractor will be responsible for the physical design and installation the entire Gantry System.	Informational						The schedule for Gantry Design and Installation will not be available until the Gantry Design contract is awarded, which we expect to coincide with the award of this contract for the Replacement Toll Collection System. For purposes of this proposal, the TSI can use the estimated dates in Appendix B Milestone schedule as the basis for assumptions.
2.4.4.10	The TSI shall provide all equipment, cabinets, and housings required to support the Lane system.	Informational						For more information about Gantry requirements, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
<b>3.2.3</b>	<b>System Capacity</b>							Average traffic is 55,522 per day. See SOW Section 3.2.1.1
3.4.2.9	All electrical outlets installed in cabinets shall be duplex ground fault receptacles.	Functional						All electrical work performed as part of this project shall meet the National electrical code.
<del>3.4.3.5</del>	<del>All roadside components shall be rated to operate in a temperature range of minus 5 degrees Celsius to plus 60 degrees Celsius with no degradation in performance.</del>	<del>Functional</del>						Requirement replaced with new text immediately below

3.4.3.5	<p>All roadside components shall be rated to operate in a temperature range of minus 5 degrees Celsius to plus <del>60</del> 50 degrees Celsius with no degradation in performance. Components installed in temperature controlled cabinets must operate in the temperature range of 5 to 35 degrees Celsius.</p> <p>This specification applies to all roadside equipment not in environmentally controlled cabinets. While this applies to servers and UPSs there is no requirement for TSI supplied UPS units and roadside "servers" not placed in controlled cabinets and not meeting these specifications would not be approved.</p>	Functional						
3.4.5.2	<p>No single point of failure shall cause more than one lane to become unavailable.</p>	Functional						<p>Requirement 3.4.5.2 states the worst case scenario and ensures that the System design does not inadvertently utilize a single device such as a network switch whose failure could result in more than one lane becoming unavailable). Note that this also applies to UPS power supplied by the District (i.e. loss of one of the District supplied UPS power feeds cannot result in more than one lane becoming unavailable. The additional specifications are included for increased reliability to prevent even one lane from becoming unavailable.</p>

3.4.6.1	The TSI shall utilize the original supplier or equipment manufacturer to calibrate, test and certify the operation of each critical System component both at the time of installation and at least annually during the maintenance period.	Functional						The TSI can perform these functions if it is able to show proven experience and references of installation, calibration, test and certification of its proposed 3rd party.
4.1	<b>General Gantry Concepts</b>							The TSI will not face any penalties or assessments due to loss of all District supplied AC power.
4.2.2.2	The TSI shall provide to the District a Gantry Requirements Document which is an initial list of Gantry requirements and concepts. This includes: <ul style="list-style-type: none"> <li>• Single or double Gantry</li> <li>• Gantry spacing (if double Gantry)</li> <li>• Roadway width of each Gantry</li> <li>• Gantry height and clearance</li> <li>• Environmental Protections</li> <li>• Sketch of Gantry indicating component locations</li> <li>• Component manufacturers mounting instructions</li> <li>• Power and communication connection requirements</li> <li>• Concepts to incorporate ways that the Gantry equipment can be moved laterally to accommodate changes in lane striping</li> </ul>	Functional						For more information about Gantry requirements, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
<del>5.2.1.1</del>	<del>The TSI shall furnish and install a pair of industrial grade Zone Controllers for control of the Lane level equipment.</del>	<del>Functional</del>						<del>Requirement replaced with new text immediately below</del>
5.2.1.1	The TSI shall furnish and install a pair of industrial grade Zone Controllers for control of the Lane level equipment. Industrial grade equipment means rack, mounted with higher vibration and temperature tolerances. Equipment in environmentally controlled cabinets must be capable of operating in a temperature range of plus 5 degrees Celsius to 35 degrees Celsius in the event they must operate for a short time under actual outside temperatures.	Functional						

5.2.1.7	The Zone Controllers shall utilize solid state drives.	Functional					<p>Research has indicated that Solid State "Drives" have reached a level of reliability and environmental tolerance that exceed that of conventional disk drives. The District feels that solid state drives will require less maintenance and less space.</p>
5.2.2.1	The Zone Controller shall utilize an industrial-grade, real-time Operating System.	Functional					<p>Industrial grade operating system means a real time operating system in which the developer has control of low level parameters such as task priorities and interrupts.</p>
5.2.3.1	Any Database software used by the Zone Controllers or other Lane components shall be COTS software.	Functional					<p>The requirements of SOW Sections 5.2.1.1 and 5.2.1.3 are not in conflict as industrial grade components are commercially available. Non-COTS equipment means custom circuits and boards that are not available to the general public.</p>

5.4.1.2	The AVC system shall determine the vehicle axle count using sensors, not by inference or estimation. Treadles and treadle strips are not acceptable.	Functional						There is no concrete slab between the gantries shown on APPENDIX C – PRELIMINARY GANTRY CONCEPT/DRAWING. Depending on the final location of your proposed Gantry, you will not have 200ft of pavement north side of the Gantries, as the roadway will be repaved with asphalt.
5.5.1.1	The Lane shall incorporate an ICS which captures front and rear images of all vehicles traversing the Toll Zone and associates them with Transactions.	Functional						To aid in customer service, accuracy and performance assessment, license plate images for all vehicles shall be captured and stored together with ALPR. However, image storage for all images has been reduced to 3 Months. In addition, while desirable, it is not necessary to perform APLR in real time, especially for valid AVI transactions.  See updated requirements: 8.2.1.1 and 8.2.1.2
5.5.1.20	<del>The TSI shall provide for the capture and performing ALPR on temporary license plates in their design at the same (or better) performance levels as permanent license plates.</del>	Functional						Requirement replaced with new text immediately below

5.5.1.20	The TSI shall provide for the capture and performing ALPR on temporary license plates in their design at the same (or better) performance levels as permanent license plates. This requirement does not include non-California temporary plates. Time will be permitted to train the ALPR system for new temporary license plates once the design is released. The TSI will be responsible for obtaining samples of the new temporary plates.	Functional						
5.6.1	<b>DVAS Camera Requirements</b>							For more information about Gantry requirements, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
5.6.1.1	The System shall provide one DVAS camera and associated illumination per travel lane.	Functional						One DVAS camera is required per toll lane. The direction of the DVAS cameras will be toward on-coming traffic. The DVAS cameras will be mounted on the Gantry.
5.7.1.2	The Occupancy Beacon shall illuminate when a valid transponder is detected during carpool hours with a switch setting set to a position indicating HOV2 or HOV3, as determined by the District business rules.	Functional						The District requires only one Beacon per lane. Detailed Beacon operation shall be determined in the project design phase.
6.1.1.5	<del>The Host shall support a minimum of twenty (20) simultaneous users accessing screens and/or running reports.</del>	Functional						Requirement replaced with new text immediately below
6.1.1.5	The Host shall support a minimum of ten (10) simultaneous users accessing screens and/or running reports.	Functional						

6.2.1.1	The Host shall be furnished with primary and secondary computer systems and associated cabinet(s), one at each of two locations designated by the District.	Functional						<p>The Host is backed up to the cloud in the event that the on-site primary and secondary Host become inoperative.</p> <p>For more information on the Gantry, please see "Attachment 1: Gantry and Infrastructure Responsibilities"</p>
6.2.1.4	<del>Each Host shall utilize less than 25% CPU capacity during peak load.</del>	Functional						Requirement replaced with new text immediately below
6.2.1.4	Each Host shall utilize less than 25% not exceed 80% CPU capacity during peak load or exceed an average of 60% capacity.	Functional						
6.3.4.1	<del>The Host application shall be browser based and shall support all current and two previous versions of Microsoft Internet Explorer, Chrome (both Windows and Android versions), and Safari (both OS X and iOS versions).</del>	Functional						Requirement replaced with new text immediately below
6.3.4.1	The Host application shall be browser based and shall support all current and two previous versions (and newer versions if necessary) of Microsoft Internet Explorer, Chrome (both Windows and Android versions), and Safari (both OS X and iOS versions).	Functional						
<b>6.4.2</b>	<b>Toll Transaction Processing</b>							Image review is the responsibility of the RCSC.
6.4.2.7	The Host shall include an Image File using the images received from the Lane for each IBT Toll Transaction sent using the RCSC ICD .	Functional						Images shall be stored at the Host and sent to the RCSC per the RCSC ICD.
6.5.1.16	The System shall enable users to create, install, configure, and incorporate new ad hoc reports into the System, without requiring software changes.	Functional						Reports developed after go-live shall be selectable from the standard Host system interactive interface. The method used to accomplish this shall be determined in the Design phase.

6.5.2	<b>Pre-Defined Reports</b>							See Addendum response A20 for clarification of
6.5.2.4	The System shall provide a Revenue by Transaction Date Report. This report shall contain daily accounting of all traffic by payment method reported by the RCSC, including RCSC interim transactions and transactions not sent to the RCSC.	Functional						It is expected that interim statuses will be received from the RCSC and stored by the Host system. The management of this information and its use in generating any of the required reports will be defined in the design phase.
6.6.2.1	The TSI shall indicate in the proposal the Alerts that will be automatically generated by the System. These will form the basis of the list of Alerts during System Design. <b>The Alerts list may be submitted as Attachment 2 to the Proposal.</b>	Proposal						
<b>7</b>	<b>NETWORK INFRASTRUCTURE</b>							For more information on the Gantry, please see "Attachment 1: Gantry and Infrastructure Responsibilities"
7.1.1.4	The System shall be furnished with a pair of firewalls (the Toll Firewalls) protecting the System from the District network and the District network from the System.	Functional						The two firewalls are required to separate control of TSI and District access to the respective systems. This concept will be finalized in the design phase however Proposers shall develop their pricing using two firewalls.
7.1.1.6	The Toll Firewall protecting the District network shall be configured and controlled by the District.	Functional						See response to 7.1.1.4
<del>8.2.1.1</del>	<del>The Host database shall retain all database data for the required life of the System (except for Images if they are stored in the database).</del>	<del>Functional</del>						Requirement replaced with new text immediately below



8.2.1.1	The Host database shall retain have the capacity to store all database data for the required life of the System (except for Images if they are stored in the database). Detailed Transaction and CSC reconciliation data shall be retained in the system no fewer than 48 months and no longer than fifty-four (54) months. Upon reaching the 54th calendar month of transaction data storage, and every six months thereafter, the TSI shall purge the earliest 6 calendar months of data. These parameters shall be configurable and may be changed from time to time depending on business rules and policy. Summary files necessary for reporting purposes will be defined in the Design phase.	Functional						
8.2.1.2	<del>The Host shall retain Image data for a minimum of three (3) years.</del>	Functional						Requirement replaced with new text immediately below
8.2.1.2	The Host shall retain have the capacity to store IBT Image data for a minimum of three (3) one (1) years. All license plate images (AVI and IBT) shall be retained no fewer than three months and no longer than 4 months. Upon reaching the 4th calendar month of image storage, and every month thereafter, the TSI shall purge the earliest calendar month of images. These parameters shall be configurable and may be changed from time to time within the sizing required above, depending on business rules and policy. The District shall have the option to delay the purge of license plate images due to processing issues.	Functional						
8.3.1.4	In the event that both the primary and secondary Hosts are unavailable, the TSI shall provide a replacement Host, restore from the cloud solution on the replacement Host, and resume all Host processing within seven (7) days.	Functional						<p>The Host is backed up to the cloud in the event that the on-site primary and secondary Host become inoperative.</p> <p>In a catastrophic event, The District will provide a new location for the TSI, and network connectivity will be determined at that time based on available locations.</p>

8.3.2.2	The Host shall be designed and configured to support a Recovery Point Objective (RPO) of zero (0) data loss, for revenue-related data including RCSC activity.	Functional						The requirement is for the Host system only and for revenue related data only. This data is available at various locations other than the host system. In addition, this is a design and configuration requirement not a performance spec. Manual recovery would be allowed and should not be impossible or cost prohibitive.
9.1.1.2	Cost items - In addition to the basic equipment and labor necessary to maintain the System the TSI shall pay for all other required maintenance costs including shipping, communications, internet, spares, third-party support, and necessary support equipment and facilities.	Maintenance						The TSI shall pay for ISP services. There is no cost to the TSI for local network communications or communications to the RCSC.
9.1.4.1	The TSI shall maintain a test facility that will allow for development, factory testing and testing of new equipment, upgrades, and software changes.	Maintenance						Test facilities shall be located in North America.
9.1.5.4	The TSI shall keep a sufficient inventory (at least one each of Lane equipment) of spare parts at the District to allow for the prompt replacement of failed components.	Maintenance						For more information on the gantry, please refer to "Attachment 1: Gantry and Infrastructure Responsibilities_Final"
9.1.5.7	The TSI shall replace components that have been repaired three times or more at GGB's option.	Maintenance						This requirement refers to a specific serial numbered component and not to a particular model number.
9.2	<b>TSI ACTIVITIES</b>							The TSI should expect to perform all preventive and corrective maintenance.

9.2.2.4	The TSI shall verify weekly that all data and images from the previous week have been saved, backed up and stored in the proper location (e.g. Primary and Secondary Zone Controllers, Primary and Secondary Hosts, and Cloud). The TSI shall sample test this data for correctness. The sample size and verification technique shall be included in the SMP. The results of this verification shall be reported to the District weekly.	Maintenance						The Host is backed up to the cloud in the event that the on-site primary and secondary Host become inoperative.
9.2.5.4	The TSI shall maintain a staff of trained personnel of sufficient quantity and quality to ensure that repairs can be performed 24 hours a day, every day of the year in accordance with response and repair requirements.	Maintenance						Repair times are not specifically specified as assessments to the TSI start at the moment of failure.
9.2.9.8	All reports shall be located in the Host reporting database to permit the generation of custom reports based on maintenance data.	Maintenance						It is not necessary that the reports identified in this section (9.2.9) are system generated. However, it is necessary that the information in the reports be stored in the Host database in a form approved by the District.
<b>10.2.3</b>	<b>Data Migration Plan</b>							There is no requirement for a Data Migration Plan or to migrate any data from the current system to the new System.
10.2.3.1	<del>The TSI shall migrate current system data to the System. The details of what data will be migrated will be developed during the System Design Phase.</del>	Functional						
10.2.3.2	<del>The migration of data shall take into consideration data elements that exist in the System but not in the current system and shall properly populate those data elements to allow all System screens and reports to function properly.</del>	Functional						

10.2.3.3	The TSI shall develop a comprehensive Data Migration Plan detailing the TSI's overall approach to the migration of data from the current system to the System. The Data Migration Plan shall define what data is moved, where it is moved from, where it is moved to, how it is moved, when it is moved, and approximately how long the move shall take.	Functional						
10.2.3.4	The Data Migration Plan shall contain a detailed mapping of current system tables and fields to the tables and fields in the System. This mapping shall clearly define any data transformations that shall be required, any data summarizations that shall be performed, and any other data manipulations which may be required to complete the migration. It shall also clearly define what data will not be migrated and why. The mapping shall also define the data migration sequence – which tables must be migrated in which order to ensure data integrity.	Functional						
10.2.3.5	The Data Migration Plan shall provide a conceptual and procedural overview of the actual data migration process including descriptions of the overall method. Key assumptions, external dependencies, and risks associated with the proposed migration process shall be documented.	Functional						
10.2.3.6	The Data Migration Plan shall provide a detailed migration timeline showing each step in the migration process, responsible parties, expected durations, data validation points, etc.	Functional						
10.2.3.7	The Data Migration Plan shall contain a section with migration data validation procedures, queries, reports, and any other tools necessary to demonstrate that the migration was completed successfully. The validation tools shall clearly highlight unexpected results and exceptions. Included in this section shall be rollback procedures in the event that the migration must be aborted.	Functional						
10.2.6.1	The TSI shall submit an outline of the System Maintenance Plan (SMP) in the Proposal. <b>The SMP may be submitted as Attachment 4 to the Proposal.</b>	Proposal						
10.2.7.1	The Proposer shall provide a comprehensive Business Continuity plan in their Proposal.	Procedural						
10.2.7.1	The Proposer shall provide a comprehensive Business Continuity plan prior to the Factory Test	Procedural						

11.1.2.5	<del>Host – The Host level system shall be designed and maintained to operate 24 hours per day and seven days per week at an availability rate of 96% per day.</del>	Performance						Requirement replaced with new text immediately below
11.1.2.5	The Host level system shall be designed and maintained to operate 24 hours per day and seven days per week at an availability rate of 96% per day week.	Performance						
11.1.3	Transaction Accuracy							<p>Speed and vehicle dimensions are to be within plus or minus 20% of the actual value.</p> <p>The District is paying for a system with certain operational requirements. The degradation of the system with respect to these requirements decreases the value of the system to the District and increases its workload in tracing anomalies, responding to public inquiry, and reduces overall confidence in the system whether or not the toll is eventually collected.</p>

December 9, 2016

Golden Gate Bridge, Highway and Transportation District  
Administration Building  
Golden Gate Bridge Toll Plaza  
San Francisco, CA 94129  
Attention: Amorette M. Ko-Wong, Secretary of the District

**Response To:**

RFP No. 2017-B-04, Replacement Toll Collection System

**Proposer:**

Kapsch TrafficCom IVHS Inc.  
8201 Greensboro Drive, Suite 1002  
McLean, VA, 22102  
Phone: (703) 885-1976  
Fax: (703) 790-9100  
john.freund@kapsch.net

**Kapsch TrafficCom IVHS Inc.** ("Kapsch") hereby transmits the attached Proposal in response to the **Golden Gate Bridge, Highway and Transportation District's RFP No. 2017-B-04, Replacement Toll Collection System**. Kapsch will deliver the Electronic Toll Collection system and services, providing a proven, reliable and cost effective toll collection infrastructure and maintenance services for the Golden Gate Bridge.

Founded in 1892, Kapsch is an enterprise that has evolved, through both organic growth and acquisitions, into a truly global transportation solution provider. Our company has supported toll systems design, integration, implementation and maintenance projects for more than 30 years, including support to some of the largest systems in North America. Throughout our history, the true foundations of our business and financial success have remained unchanged - they are the spirit of innovation, engaging customer partnerships, mature corporate values, and delivering high quality and high performance solutions. The Kapsch solution suite includes an industry-leading portfolio of integrated, end-to-end Electronic and Cash Toll Collection (ETC) and AET solutions, as well as a robust and extensively deployed Maintenance Online Management System. The evolution and growth of the Kapsch portfolio has further enabled Kapsch TrafficCom to offer its current and future customers an expanded integrated portfolio of ETC solutions extending from the highway to the city.

Kapsch believes it is uniquely qualified to support the District in the implementation of the RTCS. The proposed solution has been specifically designed to support GGB's operational and performance goals and provides the District with:

- ✓ *System redundancy providing for the required 100% system availability*
- ✓ *Proven support of implementation and transition of multi-protocol and ISO 18000-6C technology environments*
- ✓ *A complete and comprehensive maintenance system*
- ✓ *Reporting flexibility and the availability of information, providing operational and business support to the District*
- ✓ *The ability to audit the entire processes from the Roadside to the Regional Customer Service Center*
- ✓ *System and operational control across the Roadside Toll Collection System - **you see what we see.***

**Contact Person:**

John Freund  
Senior Vice President, Sales and Business Development  
8201 Greensboro Drive, Suite 1002, McLean, VA, 22102  
Phone: (703) 885-1976  
Fax: (703) 790-9100  
john.freund@kapsch.net

Kapsch hereby confirms that the proposed SOW and price proposal are valid for one hundred eighty (180) calendar days from the proposal due date.

Kapsch hereby confirms its acceptance of the Sample Agreement, with a few exceptions. Kapsch hereby respectfully submits the below three exceptions to terms and conditions contained the RFP. Kapsch, if selected for award, requests to engage in negotiations in good faith between the parties, and is confident that the parties can work together to agree on appropriate and commercially reasonable terms and conditions for this important procurement.

1. Kapsch requests to discuss a reasonable limit on the "Performance Assessments", revenue loss and liability in general.
2. Kapsch requests reasonable commercial boundaries on the indemnification provisions to include that the provision applies to the extent Kapsch is negligent in performing its responsibilities under the contract, and other clarifications on cause and fault.
3. Kapsch requests clarification language be added regarding the maintenance rather than warranty scheme, including exclusionary language regarding implied warranties.

Kapsch is not aware of any conflicts of interest that would limit its ability to provide the requested services. Kapsch has no disclosures to make pursuant to the Levine Act.

Kapsch is planning to engage the following Subcontractors in the performance of the work for the project:

- Southstar Engineering & Consulting, Inc.: Civil Professional Engineering Services.
- Arora Engineers, Inc. Scope: electrical and engineering services.
- CBL Enterprise Inc. Scope: wholesale procurement of Information Technology equipment.

These entities will to perform work pursuant to subcontracts that will be negotiated at the time of award and detail the requirements for the delivery of their individual scopes listed above.

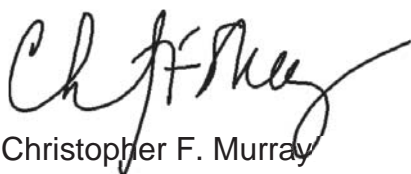
Kapsch hereby confirms that it meets each of the below Minimum Qualifications set forth in Section 6 of the RFP:

- Kapsch has completed completed, as the prime contractor, at least three projects of similar scope to the District's project.
- Acting as the prime contractor, Kapsch has developed and implemented at least one (1) currently operating ORT/AET tolling system in North America similar to that required by the District.
- Kapsch hereby certifies that it is not currently in default of a toll system project.
- Kapsch hereby certifies that at least 75% (in Dollars) of the System design, development, and maintenance will be performed by full time employees of Kapsch.

Kapsch hereby confirms that the below company representatives who sign this letter have the authority to act for and bind Kapsch TrafficCom IVHS Inc. in all matters relating to the Proposal.

The Kapsch group of companies takes pride in building long-standing partnerships with our customers. We act as an extension of the organizations we partner with operating with transparent visibility of both processes and systems, sharing the same appreciation of project success and providing toll collection systems and tools that work for our customers. Kapsch fully comprehends the nature of the tasks involved in the Scope of Work and Requirements, and their importance to the District, and we are fully prepared to provide the District with a proven and effective toll system and services solution.

Respectfully,



Christopher F. Murray

President and CEO



Michael Hofer

CFO



*Craig Koudelka, PE*  
**Gantry Coordinator**

**SPECIFIC SKILLS**

- Civil design and verification
- Single gantry civil design
- Subcontractor management and communication

**SUMMARY OF QUALIFICATIONS:**

Highly qualified open road tolling civil engineer with extensive experience in single gantry tolling implementations involving management of civil subcontractors, and communications with tolling authorities / state organizations

**EDUCATION, TRAINING, AND CERTIFICATION:**

- Bachelor of Science, Civil Engineering, Texas A&M University

**EXPERIENCE**

Experienced in open road tolling, Gantry equipment design, installation, safety, and AC power. Served as project manager, civil design manager for projects ranging in construction cost from \$25M to \$1.2B. Management responsibilities including: Managing civil sub-contractors, calculating future staffing projections, interviewing and hiring employees, managing design team, tracking project budgets, ensuring timely delivery of projects, conducting monthly progress meetings with clients, preparing monthly invoices and written progress reports, drafting proposals and negotiating fees for new projects, coordinating with local, state, and federal agencies and working closely with colleagues across multiple disciplines.

Served as project engineer on Collin County, Denton County, NTTA, and TxDOT projects. Involved in leading the preparation of design schematics, sign design, alternative analysis design, and PS&E design.

**RELEVANT WORK HISTORY**

- Kapsch TrafficCom IVHS (Mar 2013 – Present); Civil Design Manager/Project Manager
  - North Tarrant Express (NTE) and LBJ Express projects in Dallas and Tarrant Counties, North Texas(Civil Design Manager/ Project Manager)
  - Louisville-Southern Indiana Ohio River Bridges (LSIORB), (Project Manager)
- HNTB Corporation (May 2009 – Mar 2013); Project Manager/ Squad Leader
  - FM 552, Rockwall County, Texas (deputy project manager)
  - IH-35E over the Trinity River, Dallas, Texas; (Roadway Task Manager)
  - Corridor Program Office, TxDOT Strategic Projects Division, Austin, TX; (Signing task lead and roadway designer/ reviewer)
  - IH 35W, Denton County, Texas; (deputy project manager)
- HNTB Corporation (Jan 2005 – May 2009); Project Engineer
  - DNT Corridor Planning, North Texas Tollway Authority Program Management Office, Collin County, Texas
  - IH 35, TxDOT Waco, Texas
  - DNT Ramping Modifications, NTTA, Plano, Texas

*Daniel Lafuente*  
**Maintenance Manager**

#### SPECIFIC SKILLS

- 6 years' experience in Toll System software engineering, maintenance and support
- 3 years' Software & Maintenance Management experience for major toll systems.
- Software engineering and development, new product design, software configuration management
- Operations and Maintenance Management including system audit, performance management and reporting, supervision of hardware and software technicians, monitoring and report of key performance indicators and metrics

#### SUMMARY OF QUALIFICATIONS:

As Maintenance Manager, Mr. Lafuente has direct responsibility for meeting all operational toll system KPI metrics which are independently audited on an annual and semi-annual basis. His team provides 24-7 system monitoring and maintenance response to any performance degradation, for multiple toll systems across the United States.

#### EDUCATION, TRAINING, AND CERTIFICATION:

- BS in Computer Science, with a Minor in Mathematics, St. Edward's University (2012)

#### EXPERIENCE

Mr. Daniel Lafuente began his career at Schneider Electric in 2010 as a Software Support Technician. As a support technician, Mr. Lafuente supported all aspects of the tolling system software from testing, to in-lane, managed lanes, back office, operations, and maintenance. In 2012 Mr. Lafuente was promoted to Software & Maintenance Support Engineer. His in-depth knowledge of all of Schneider Electric's tolling system architectures includes expertise in all layers of the operational support and maintenance of servers, lane side software, database, backoffice software, and lane side hardware. Since 2014, Mr. Lafuente has provided maintenance management for all Tier 1, 2 and 3 support – including leading up to 15 software support and hardware technicians. Mr. Lafuente works directly with clients to proactively support and maintain their systems in addition to providing research and resolution support for system and maintenance issues.

#### RELEVANT WORK HISTORY

- Remote Maintenance Management Lead: WSDOT RTS, CTRMA, NETRMA, CCRMA, CRRMA, RITBA, PP895, NHDOT  
 Leads Maintenance Team responsible for 24-7 system monitoring and performance management via ROMS. RITBA, PP895, NHDOT are all E-ZPass systems.. WSDOT RTS and CTRMA comprise more than 20 toll zones and 150+ lanes, similar in size/scope to PTC. Provides review of daily analytics, monthly maintenance reporting, assesses system performance history over time, manages software and hardware configuration including any update patch or bug fix releases, ensures compliance with contract KPIs and assures respond and repair in the required timeframes. Supports technician scheduling and task assignments via ROMS for preventive and scheduled maintenance. Ensures network and security administration for all ROMS systems.
- Technical Lead Maintenance Operations – WSDOT SR520 – Washington State, WA SR-520 ORT; Contract Value \$4.7 Million, four (4) lanes and 32 Million Annual Transactions. Mr. Lafuente developed, installed, and maintained the ROMS monitoring system for the WSDOT tolling network. He drives customer maintenance meetings and ensures all MMR and KPI requirements are being met and processed within the required time periods. Mr. Lafuente lead the team responsible for 24/7 uptime of all revenue collection systems, and drove the completion of annual Performance Audits and Service Organization Controls (SOC) audits as required per customer contracts.
- Technical Lead – Maintenance Operations – New Hampshire Department of Transportation– New Hampshire
- NHDOT; EZ Pass Lanes, Contract Value \$5.0M sixteen (16) lanes, and 30 Million Annual Transactions. Mr. Lafuente coordinated with Project Managers and the Customer to drive the action items required, finalizing the contract and beginning maintenance operations. Daniel oversees

day to day operation, managing remote technicians and software support to ensure 24/7 uptime of the system. He coordinates with local customers and authorities for maintenance activities such as road closures, equipment repair, and software releases.

- Maintenance Support Lead and Software Developer – North East Texas Regional Mobility Authority – Tyler – Texas
- NETRMA; Contract Value \$10M, thirty six (36) lanes, and 11 Million Annual Transactions. Mr. Lafuente developed, installed, and maintains the ROMS monitoring system for the NETRMA project. He incorporated Nagios, an open source solution, as an enhancement to the product to reduce costs and integrate with ROMS for more extensive monitoring options and capabilities. Mr. Lafuente supported the development of the back office system reporting structure used for MMR completion showing that all maintenance KPIs are being achieved. In addition, Mr. Lafuente configured ROMS to work seamlessly with NETRMA retrofit sites that were implemented as part of the project after initial installation work was completed on the first NETRMA system.

*Tony Marti*  
Project Manager

**SPECIFIC SKILLS**

- Tolling Operations
- Project Management
- System Detailed Design

**SUMMARY OF QUALIFICATIONS:**

Tony has been working in the tolling industry since 2011 working in the WSDOT Tolling Operations group for over 4 years, and since 2015 as a Project Manager for Kapsch on the WSDOT Roadway Toll System contract. Most recently Tony has completed the development and completion of I-405 Express Toll Lanes, SR167 HOT Lane Transition and Extension, and finally the SR520 ORT System.

**EDUCATION, TRAINING, AND CERTIFICATION:**

- BS in Civil Engineering from University of Washington, 2005
- PE – WA Professional Engineering License (2012) – Lic #49492

**EXPERIENCE**

Tony Marti has engineered and managed multiple transportation and Intelligent Transportation System projects as projects for Washington State for over a decade, from his support at HNTB to King County ITS and traffic signaling projects through his role at Jacobs Engineering supporting WSDOT's Toll Operations Group.

While with Kapsch, Tony has managed the delivery of multiple toll systems. His work includes the close out of the I-405 ETLs, the design and installation of the SR167 HOT Lane Transition and Extension projects, and the SR520 Open Road Tolling system (currently in installation and testing phase).

**RELEVANT WORK HISTORY**

- I-405 Express Toll Lanes (ETL) – Project Manager. This photo and transponder based toll system is approximately 15 miles long, made up of 21 toll zones. The system includes multi-point Trip assembly in two directions of I-405. The System includes three toll fare-zones in each direction. Customers using the system are detected at one or more Toll Zones and, depending on the length of their Trip, are charged the toll rate they see in advance of their point of entry.
- SR167 HOT Lane Transition and Extension – Project Manager. This transponder based HOT Lane toll system is approximately 10 miles long, made up of 13 toll zones. Phase 1 of the project included transitioning the existing HOT Lane tolling system (10 toll zones) from the original vendors system to a Kapsch system. Phase 2 of the project included the extension of the southbound direction adding 4 toll zones.
- SR520 ORT Lanes – Project Manager. This single toll point system provides photo and transponder based tolling across 8 lanes and 5 instrumented shoulders. The pricing is based on time of day traffic patterns and toll rates are set every year. The project is currently in the testing phase.

*Pavel Podniesinski*  
**RCSC Coordinator**

#### SPECIFIC SKILLS

- Oracle 8i, Oracle 9i, 10g, 11g RAC (Real Application Clusters), and 11g Server administration
- Supported Oracle on HP-UX, Sun Solaris, Linux, AIX, and Windows 2000/XP platforms
- Well versed in partitioning, advanced replication, streams, standby database (Data Guard), log mining, RMAN, SQL Loader and other advanced Oracle features
- Proficient in Oracle PL/SQL, Erwin Data Modeler, Unix shell scripts
- Oracle Enterprise Management, Grid Control and Quest systems management tools.
- Administration of SQL Server 2000 in a clustered environment

#### SUMMARY OF QUALIFICATIONS:

Pavel Podniesinski has over 17 years of Oracle Database Administration experience including production and development, ecommerce and data warehouse experience.

Pavel started his career as a junior Oracle DBA in Edmonton, Canada right after finishing his degree in Computing Science. He left the company after two years and in 1999 joined Motorola in Fort Lauderdale, FL.

#### EDUCATION, TRAINING, AND CERTIFICATION:

- B.Sc. in Computing Science with Business Minor, University of Alberta, Edmonton, Canada, 1998
- Administering MS SQL Server

#### EXPERIENCE

At Motorola Pavel was a member of the 3-person DBA team supporting operation of a major manufacturing facility. Pavel installed, configured, maintained, troubleshot and tuned multiple Oracle database environments. Notable achievements include the design, configuration, installation and maintenance (24x7) of replicated environment to enable Motorola manufacturing and distribution of phones uniformly in Florida, Tennessee, and multiple sites in China.

In 2005 Pavel joined Interval International where he was a principal DBA for all database aspects of www.liveitup.com system, the new business venture that allows thousands of members to plan all aspects of their vacations using excess resort inventory, transportation options and various other third party options.

Starting in 2007 Pavel joined Schneider Electric, which morphed into Kapsch TrafficCom. Since 2007 Pavel has been involved in all aspects of database design, deployment, maintenance, and installation of ORT solutions for multiple projects – RITBA, NHDOT, WSDOT and CTRMA. He is currently Database Team lead for 9 person database team. He provides task coordination and guidance to less experienced team members, responsible to maintain architectural and design principles across the projects.

#### RELEVANT WORK HISTORY

- Kapsch Remote Operations and Monitoring System (ROMS) – Austin, TX 2007-present  
 System design, development and implementation  
 Senior Oracle DBA responsible for all aspects of Schneider Electric's Oracle databases infrastructure. Since joining the company in August 2007, Pavel implemented comprehensive database backup strategy to ensure data recoverability on all s owned and maintained Oracle databases varying from small (10 GB) to very large (1.5 TB) systems. Developed and maintained PL/SQL code for ROMS and other projects and migrated/upgraded oracle Forms and Reports application from multiple 10g environments to consolidated 11g environment  
 As a DBA he troubleshot performance, optimized and tuned databases, SQL queries and PL/SQL code and also maintained development and test database environments for multiple projects (including data cleansing)
- WSDOT I-405 Express Lane, Washington State 2012-present System design, development and deployment  
 One of the 3 principal architects of the Trip Building Engine that allows to build single transaction (trip) for vehicles traveling through multiple tolling

2000 Database – course #2072,  
Microsoft Certified Education  
Center, Boca Raton, FL, Apr 2003

- Oracle 10g RAC and 10gR2 Grid  
Control, Oracle Education, Miami,  
FL Workshops, Jan 2007

points

Principal designer and developer for first installation of Trips Engine  
implementation in North America, for WSDOT I-405 Express Lane project  
(22 tolling points, over 40,000 vehicles daily)

- Central Texas Regional Mobility Authority, Austin, TX 2015 System  
migration of the tolling revenue and monitoring system Planned, designed,  
team coordinated and delivered CTRMA system migration from outdated  
10g platform to the latest 11g RAC installation. This massive effort resulted in  
updated system (architecturally in line with latest SE products), with vastly  
improved performance, scalability, and availability.
- New Hampshire Department of Transportation, Concord, NH2010- 2011  
Database Administrator and Developer  
Principal designer/developer of back-end of reporting interface for  
NHDOT project, participating at every level of the development lifecycle  
(requirements, client communication, design, testing, deployment)  
principal architect/designer and principal implementer of host database  
solution for NHDOT ORT systems  
Installed, tested and maintained Host and ROMS databases for all  
phases of the project.  
Member of a test team that conducted successful delivery of NHDOT  
FAT, commissioning, and operational testing.

**ATTACHMENT F**

**PRIME CONTRACTOR AND SUBCONTRACTOR/SUBCONSULTANT/SUPPLIER REPORT**

# GOLDEN GATE BRIDGE, HIGHWAY & TRANSPORTATION DISTRICT Prime Contractor and Subcontractor/Subconsultant/Supplier Report

Bidder's Name: Kapsch TrafficCom IVHS Inc.  
 Address: 8201 Greensboro Drive, Suite 1002, McLean, VA 22102, USA  
 Owner or Contact Person: John Freund (Contact Person)

Contract # and Name: RFP No. 2017-B-04 for REPLACEMENT TOLL COLLECTION SYSTEM  
 Is your firm a Disadvantaged Business Enterprise: Yes No X  
 Phone: ( 703 ) 885-1976 Fax: ( 703 ) 790-9100

**Instructions:** Bidder is required to provide the following information on ALL subcontractors/subconsultants/suppliers that provided Bidder a bid, quote, or proposal for work, services or supplies associated with this contract. This information should be provided for all sub-bidders regardless of tier for both DBEs and non-DBEs alike. Include all bid acceptance(s) AND rejection(s). In the event that incomplete information is provided, the District will contact the Bidder to obtain the information. Signature is required on page two of this form.

	Subcontractor/Subconsultant/Supplier Firm Name/Address/Contact Information	Contractor's License No. (if applicable)	DBE (Yes*/No)	Portion of Work or Type of Materials/Supplies	Dollar Amount of Work/ Materials/Supplies	Bid/Quote Accepted (Yes**/No)	DBE Amount***
1	Name: Southstar Engineering & Consulting, Inc. Address: 1945 Chicago Avenue, Unit C Riverside, California 92507 Contact Person: Amr Abuelhassan, MS, PE, QSD Phone & Fax: (951)342-3120 (951)342-3148	N/A	YES #42043	Civil Professional Engineering Services	\$50,000	Yes	\$50,000
2	Name: Arora Engineers, Inc. Address: 6920 Santa Teresa Blvd, Ste 208 San Jose CA 95113 Contact Person: Howard Paige, P.E. Phone & Fax: T: 650-488-7504 F: 610-459-7950	Certificate No. E 16697	YES #41761	Electrical Professional Engineering Services	\$50,000	Yes	\$50,000
3	Name: CBL Enterprises Inc Address: 401 N Lombard Street Unit# E Oxnard CA 93030 Contact Person: James Chambers Phone & Fax: 805-233-7343	N/A	YES #42437	Computer, Equipment & Material Supplier	\$517,500	Yes	\$517,500
4	Name: Address: Contact Person: Phone & Fax:						



**Prime Contractor and Subcontractor/Subconsultant/Supplier Report (Continued)**

Subcontractor/Subconsultant/Supplier Firm Name/Address/Contact Information	Contractor's License No. (if applicable)	DBE (Yes*/No)	Portion of Work or Type of Materials/Supplies	Dollar Amount of Work/ Materials/Supplies	Bid/Quote Accepted (Yes:**/No)	DBE Amount***
5						
6						
7						

Attach additional sheets as necessary.

DBE Amount: \$ 617,500.00 = 12.16% % Bidder's DBE Achievement  
 Total Bid Amount: \$ 5,077,553.00

- \* If Yes, please also provide Unified Certification Program certification number in box. Bidders need to be aware that state and local governments may have other types of certifications with different requirements.
- \*\* Do not indicate more than one "Yes" for alternative subcontractors for the same work.
- \*\*\* DBE participation includes that portion of the work actually performed by a certified DBE with its own forces. For example, for DBE supplier, count 60% of the costs of materials and supplies.

The undersigned agrees that if it is the successful bidder and is awarded the contract with Golden Gate Bridge, Highway & Transportation District, it will enter into a formal agreement with the subcontractor(s), subconsultant(s) and/or supplier(s) whose bid/quote was accepted for the work as indicated above. I certify that the information included on this form is accurate and true.

  
 Signature of Owner/Authorized Representative  
 Christopher F. Murray / Michael Hofer

President and CEO / CFO Title  
 12/9/16 Date

## **ATTACHMENT G**

### **DESCRIPTION OF THE SELECTION PROCESS OF SUBCONTRACTORS/SUBCONSULTANTS/SUPPLIERS**

## **Description of the Selection Process of Subcontractors/Subconsultants/Suppliers**

Contract # and Name: RFP No. 2017-B-04 for REPLACEMENT TOLL COLLECTION SYSTEM  
Proposer's Name: Kapsch TrafficCom IVHS Inc.  
Address: 8201 Greensboro Drive, Suite 1002, McLean, VA 22102, USA  
Phone: (703) 885-1976 Fax: (703) 790-9100  
Owner or Contact Person: John Freund (Contact Person) Title: Senior Vice President

Provide a narrative description of how the proposer selected its subcontractors/subconsultants/suppliers, including the following elements: (Please attach additional sheets as necessary.)

1. Soliciting small businesses, including DBEs, to participate through all reasonable and available means.

Example: Include attendance at pre-bid meeting, advertisements, written notices and agencies, organizations or groups contacted to provide assistance in contacting, recruiting and using small business concerns.

Kapsch personnel, including senior sales and marketing management, solicited DBE participation by performing the following:

1. Attended the GGB RTCS pre-bid conference, and provided materials and Kapsch contact information to all DBE representatives present.
2. Kapsch personnel created detailed request for quotes (RFQs) and Statements of Work (SOWs) which were disseminated to DBE firms to request quotes and solicit participation in the Kapsch Golden Gate Bridge RTCS project team.
3. Kapsch used online resources, including the CA.gov California Department of Transportation Office of Business and Economic Opportunity website, to search for DBEs to solicit to be part of the Kapsch Golden Gate Bridge project team.
4. Kapsch emailed requests to join the Kapsch Golden Gate Bridge project team to qualified DBE firms.

2. Selecting portions of the work that are economically feasible for small businesses, including DBEs.

Example: List items of work which the proposer made available to small business concerns, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the proposer with its own forces) into economically feasible units to facilitate small business participation.

Kapsch invests considerable thought and time into the process for selecting portions of the work that are economically feasible for small businesses, including DBEs. Our selection process follows a methodical sequence of actions and evaluations, both in terms of the overall scope of work to be performed, as well as the small business or DBE qualifications and capabilities to successfully perform the tasks involved. Because Kapsch is committed to ensuring the highest quality of the solution delivered, Kapsch does not select unqualified DBE participants simply for the sake of meeting specific DBE goals, as Kapsch does not consider that this method would satisfy the goals of Golden Gate Bridge Transportation District. Rather, we ensure that the scope items selected for DBE participation will provide added value and benefit to the District, and ensure that qualified and technically competent professionals are added to the project team. Due to the nature and scope of the work to be performed, the GGB RTCS proposal does not offer many small business and DBE participation activities that meet the Kapsch DBE selection standards described above. For example, the GGB RTCS project team is self-performing gantry design, gantry installation and also gantry toll equipment installation; historically these are activities that Kapsch solicits qualified DBE firms to perform. Kapsch has, however, determined that engineering design services and equipment procurement were the best suited scope of work for DBE participation. Other activities, such as toll equipment tuning and software development, are performed by internal Kapsch personnel who have the required years of experience needed to perform such key technical functions; these functions do not lend themselves to DBE inclusion.

3. Providing adequate information about plans, specifications and requirements in a timely manner to small businesses, including DBEs.

Example: List dates of written notices soliciting bids from small businesses and the dates and methods used for following up initial solicitations to determine with certainty whether the small businesses were interested.

The methods used to contact DEB firms are listed in the response to Question 1 above. The list of dates and firms contacted are listed in Attachment F. Most of the contact with the small businesses was performed by email, with supplemental phone calls to provide supporting information and answer questions.

4. Negotiating in good faith with small business concerns, including DBEs.

Kapsch has negotiated in good faith with all DBE respondents, to make sure every one of them had a fair chance of becoming our DBE partner if they were qualified to perform the work.

- 5. Not rejecting small business concerns, including DBEs, as unqualified without sound business reasons.

Example: Explain reasons for rejecting bids from small business concerns and accepting sub-proposals from selected firms.

Kapsch did not reject any bids from the equipment procurement DBEs.

Kapsch needs only one engineering subcontractor for the allocated scope, as it is not feasible to divide it between more than one. Kapsch selected its engineering services DBE partner from the qualified list of respondents, because the selected subcontractor provided what we deemed to be the best value for the project. We rejected bids that did not offer economically feasible pricing and/or did not have qualified personnel on staff to perform the services requested.

- 6. Making efforts to assist small business concerns, including DBEs, in obtaining required bonding, lines of credit, or insurance.

Kapsch will offer to provide financing assistance to its DBE equipment procurement firm. Some of the possible options provided include interest free lines of credit via advanced mobilization payments, reducing invoicing and payment terms from 30 days to 15 days upon receipt of invoice, and extending volume purchase discount from our vendors to our DBE partners.

- 7. Making efforts to assist small business concerns, including DBEs, in obtaining necessary equipment, supplies or materials.

All of our qualified DBE partners selected for this project have the necessary equipment, supplies or materials to perform the scopes of work assigned to them.

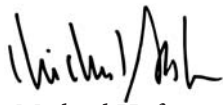
- 8. Describe any other steps that the proposer used to select its subcontractors/subconsultants/suppliers.

Kapsch used lists from Calrans and lists provided by GGB professionals. In addition Kapsch approached some industry qualified individuals and entities who were not DBEs but who had the qualifications necessary to participate in the Kapsch Golden Gate Bridge project team. We advised these individuals and entities on the process to obtain CA DBE certification, in an effort to expand the qualified DBE pool for the project.

The undersigned certifies that the above narrative description is true and accurate, and may be relied upon by the District in evaluating the proposer's compliance with the proposal requirements.



Christopher F. Murray / Michael Hofer



President & CEO / CFO

12/09/16

Signature of Owner or Authorized Representative

Title

Date

# Annual Financial Statements Fiscal year 2015/16.

always one step ahead

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# Management Report.

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## Kapsch TrafficCom AG on the Consolidated Financial Statements as of 31 March 2016.

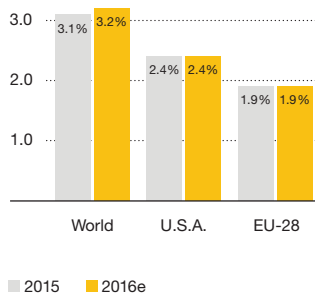
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### 1 Economic Climate.

#### 1.1 General economic situation

##### Global economy

**GDP growth**  
(in %)



Source: IWF World Economic Outlook

Economic developments in the year 2015 lagged behind the previous year but remained robust with global economic growth of 3.1 % (2014: 3.4 %). While the developed economies gradually returned to a moderate growth path, the emerging and developing countries once again experienced low growth rates, although they were still responsible for roughly 70 % of global economic growth. In light of the weaker economic situation in 2015, global trade expanded by only 2.8 % after a growth of 3.5 % in the previous year. In 2016, however, growth in the internationally traded volume of goods and services is expected to be stronger again. The economic forecast for the coming years indicates a somewhat more dynamic development for the global economy: According to the International Monetary Fund (IMF), 2016 will see an expansion of 3.2 % and 2017 will see 3.5 %.

##### U.S.A.

The U.S. economy exhibited growth of 2.4 % in the year under report, identical with the previous year. At the end of 2015, the Federal Reserve (Fed) made the first direction change in the interest policy since 2006, raising the U.S. prime rate first to 0.25 % and then to 0.50 %. Due to the early announcement and generally staged “normalization” of the monetary policy, however, this hardly had any effect on the global economy. Economic optimism during the year under report was dampened by the strong dollar, which posed difficulties for the export business. Private consumption remained the main growth engine.

##### Emerging markets and developing economies

Economic growth slowed once again in the emerging and developing economies.

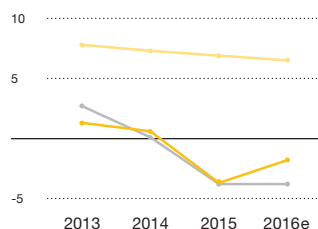
The emerging and developing economies experienced the lowest growth during the reporting year since the financial crisis of 2008/09 at 4.0 %. Economic development was further inhibited by the continued low raw materials prices, among other factors.

China’s economic growth dropped below the 7 % mark in the reporting year to hit 6.9 %, the lowest value since 1990. The country is in a process of transformation from labor-intensive and export-oriented manufacturing to a more heavily technologized and service-based economy. For the coming years, a further slowdown in growth to 6.5 % in 2016 and 6.2 % in 2017 is expected. Overall, however, the situation in Asia is positive. India achieved an impressive rise in GDP of 7.3 % in 2015. The ASEAN-5 countries are seeing at least a gradual improvement in economic output. GDP growth increased from 4.6 % in the previous year to 4.7 % in 2015 and should expand still further according to the IMF.



## GDP growth 2012-2016e

(in %)



■ Russia  
■ China  
■ Brazil

Source: IWF World Economic Outlook

The Commonwealth of Independent States (CIS) continued to suffer during the reporting year from the Russia-Ukraine conflict, low oil prices and high inflation. In consequence, economic output shrank by 2.8 %, following the moderate growth of 1.1 % achieved in 2014. The economically largest member of the CIS, Russia, was confronted with a GDP decline of 3.7 % in 2015. As in the previous year, the economic outlook was clouded by the fall in the oil price, the economic sanctions by the EU and the deterioration of the ruble.

In the region Latin America (including the Caribbean), economic output also declined in 2015, although only by a moderate 0.1 %. Larger economies in particular, such as Brazil, Venezuela and Argentina, experienced negative growth rates as a result of weak raw material prices, a decline in demand, high volatility on the financial markets and structural problems. Other economies, such as Peru, Mexico and Chile, were able to continue achieving low single-digit expansion rates.

The generally subdued economic development that prevailed during the year under report was also observed in sub-Saharan Africa and in the MENAP region (Middle East and North Africa, Afghanistan and Pakistan). A significant slowing of growth to 3.4 % (2014: 5.1 %) was registered in the countries south of the Sahara, while the MENAP region grew by only 2.5 % after achieving 2.8 % in the previous year.

## Europe

In Europe, economic growth found firmer footing compared with the previous year, with the aggregated gross domestic product of the EU-28 rising by 1.9 %. The solid consumer demand was the main factor behind this development, while the willingness of companies to invest suffered from the slowing global economy. The various developments at the country level were also noteworthy. While GDP growth in the large economies of Germany (+1.7 %) and France (+1.1 %) was below the EU average, some countries, such as Ireland (+6.9 %) grew comparatively strongly. For 2016, economists expect the level of growth in Europe to remain unchanged due to difficult international conditions. However, the situation on the labor market may improve further. After unemployment in the EU-28 fell below the 10 % mark already in 2015, it hit the lowest value in seven years with 8.9 % at the start of 2016.

In the eurozone, economic growth remained lower than in the EU-28 despite a continuation of the expansive monetary policy.

Economic developments in the euro region were unable to keep up with the overall EU during 2015. Compared with 2014, the economic growth in the currency union amounted to 1.6 %. However, the predicted start of a deflation phase was not observed in the majority of euro countries, although the target of an inflation rate just under 2 % was not achieved. The European Central Bank (ECB) therefore broadened its expansive monetary policy in the reporting year and extended the program for the purchase of government bonds and other securities until at least the end of March 2017. In addition, the prime rate was lowered to 0 % for the first time in history at the start of 2016 in order to further stimulate the real economy.

A slight improvement was observed in 2015 with regard to economic development in Central and Southeastern Europe. In comparison with the EU-28, this region continued along a path of economic recovery. The positive regional developments were overshadowed by the still precarious situation in Ukraine and Russia. The Czech Republic, Romania, Poland and the Slovak Republic nevertheless each achieved GDP rates over 3 %. In 2016, Central and Southeastern Europe should remain on a stable growth course overall.

## Austria

Austria recorded GDP growth of only 0.9 % in 2015.

Austria's moderate economic recovery continued in the year under report. The gross domestic product grew in 2015 by 0.9 %. The growth contribution from foreign trade was lower than it has been in the past. In concrete terms, the nominal growth in goods exports was only 2.7 % as a result of the economic slowdown in the emerging markets and the EU sanctions against Russia. For 2016, economists nevertheless expect somewhat stronger GDP growth of 1.6 %.

## 1.2 Development of the market for intelligent transportation systems (ITS)

Kapsch TrafficCom addresses the market for intelligent transportation systems (ITS).

Kapsch TrafficCom addresses the market for intelligent transportation systems (ITS). ITS refers to systems in which information and communication technologies are employed to support and optimize transportation, including infrastructure, vehicles, users and industry.

### Market segmentation

The study "Intelligent Transportation Systems – A Global Strategic Business Report" from Global Industry Analysts, April 2014, describes the ITS market as a diversifying market with widely differing application and product segments. Thus, the market comprises the following three product segments:

The ITS market is divided into three product segments.

**Electronic toll collection (ETC)** enables drivers to pay toll fees without stopping at toll stations.

**Traffic management systems (TMS)** monitor traffic, optimize signal timing and regulate the flow of traffic.

**Other intelligent transportation systems (OTH)** comprise in particular:

- ▶ *Commercial vehicle operations (CVO)* encompassing systems for operating commercial vehicles in order to enhance freight carrier productivity and safety,
- ▶ *Public vehicle transportation management systems (PVTMS)* facilitating management of both local and long-distance public transportation, and
- ▶ *Advanced vehicle information systems (AVIS)* transmitting traffic-related vehicle information to travelers before or during the trip or provide navigation services.

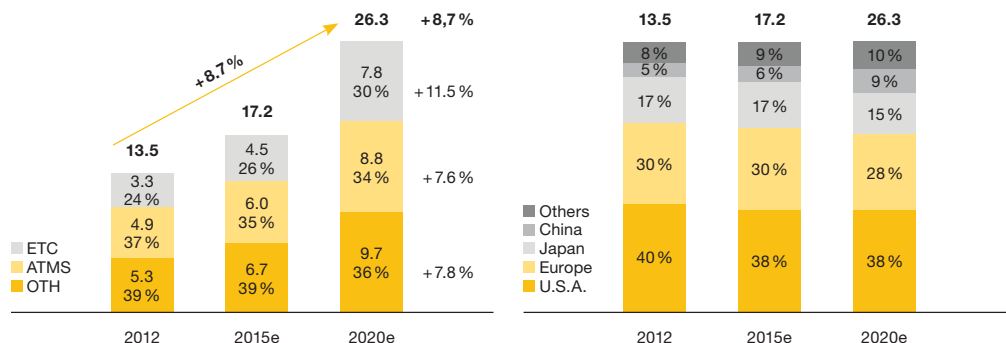
### Market volume and growth

The global volume of the ITS market in the year 2015 has been estimated at USD 17.2 billion.

Global Industry Analysts (April 2014) estimated that the global volume of the ITS market would amount to USD 17.2 billion in 2015, with the expectation of further growth. The largest product segment in 2015 was Other Intelligent Transportation Systems, accounting for 38.8% (USD 6.7 billion). Based on a worldwide volume of about USD 4.5 billion, ETC had an ITS market share of 26.0%. The largest geographic region for ITS in 2015 was the U.S.A. at 38.2%, followed by Europe at 30.3%.

According to the study, the ITS market will grow between 2012 and 2020 by an average of 8.7% per year and should reach a global volume of USD 26.3 billion by 2020, of which ETC will make up USD 7.8 billion or 29.5%. The strongest growth in all product segments is expected for ETC with annual growth of 11.5%.

Global ITS market by product segment and by geographic regions (in USD billion)

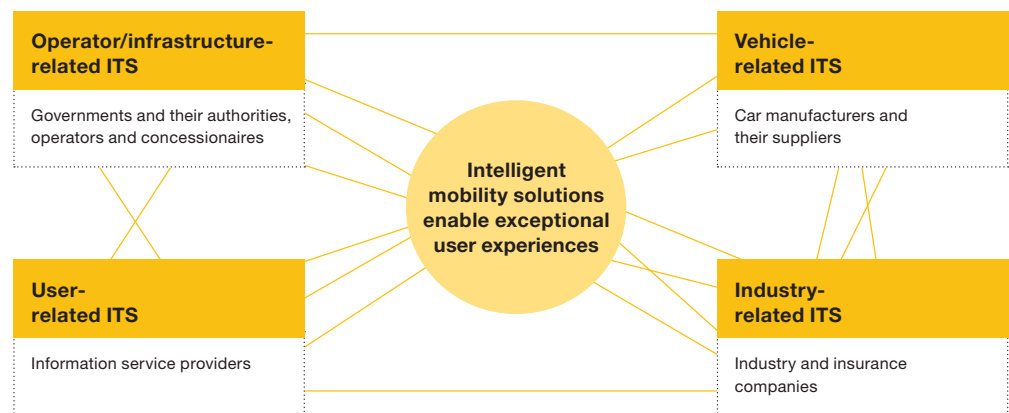


The past four years have shown that trends on the ITS market have arisen – in part due to economic conditions – that have significantly influenced developments. Thus, the actual market volume deviates from these forecasts from the year 2012.

### Customer segments

Kapsch TrafficCom divides the ITS market according to customer segments and the key target groups.

Kapsch TrafficCom has developed its own understanding and its own view of the ITS market in order to define and develop its own market positioning. From this perspective, the ITS market was divided into four customer segments and the corresponding primary addressees were identified.



The current focus lies on operator/infrastructure-related ITS.

**Operator/authority-related ITS** encompass both ETC and ATMS as well as applications for urban access and parking space management. The addressees are governments and their authorities, road and toll operators as well as concessionaires that develop transportation policies using ITS to ensure the availability and quality of the infrastructure in a way that improves safety, performance, security and environmental protection.

**Vehicle-related ITS** aim at in-car telematics such as remote diagnostics or driver assistance systems (AVIS). They are intended mainly to enhance vehicle productivity, particularly that of commercial vehicles (CVO), as well as traffic safety and security. Addressees are mainly car manufacturers and their suppliers. This field also includes systems for real-time interaction between vehicles (vehicle-to-vehicle; V2V) as well as between vehicles and infrastructure (vehicle-to-infrastructure; V2I), collectively abbreviated as V2X, which Kapsch TrafficCom believes will be based on 5.9GHz technology.

**User-related ITS** are focused mainly on convenience and efficiency for travelers. The customer in the car receives information to aid in orientation during the journey, thereby increasing traffic safety. Example applications for advanced vehicle information systems (AVIS) include transmitting traffic-related vehicle information to travelers before or during the trip as well as navigation services. Addressees are information service providers such as wireless network operators, radio broadcasters and vendors of portable navigation devices as well as end users, in the latter case primarily with respect to future solutions.

**Industry-related ITS** encompass commercial applications designed to reduce the costs or maximize the yield of vehicle fleet operators, including public transportation companies (PVTMS). Example applications include systems for fleet management and for collecting information on the logistics of large-scale vehicle operators. Among the addressees are insurance companies, who see pay-as-you-drive car insurance as a promising way to attract new customers by offering fair insurance rates and ITS-based value-added mobility services.

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Kapsch TrafficCom strives to play a leading role in intelligent mobility solutions.

### Market positioning

The current focus of Kapsch TrafficCom aims at the operator/infrastructure-related segment of the ITS market. In accordance with Strategy 2020 and the effort to develop intelligent mobility solutions, vehicle- and user-related ITS will increasingly take center place. Kapsch TrafficCom also continuously observes the other developments in industry-related ITS.

### Market trends and drivers

Kapsch TrafficCom believes that the following factors are the main trends and drivers of the market which it currently addresses.

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The megatrends of mobility, urbanization and climate protection are impacting and changing the ITS market.

**Mobility.** With increasing affluence, the desire for mobility and the associated demands on transportation systems also increase. Mobility is increasingly viewed as a basic need or a necessity. The transportation systems that have been developed to meet this need vary considerably around the world. The number of cars per 1,000 residents therefore serves as an indicator to assess the development level and untapped potential in many countries. While the U.S.A. has an average of 800 cars per 1,000 residents, the ratio in South American countries falls to just 100 cars, and the figure is even significantly lower in some African countries. If the emerging countries like China and Brazil continue the process of catching up to more developed nations economically, it can be assumed that individual transportation will experience strong growth as well. The developments with regard to new car registrations confirm this picture. In China alone, over 18 million new cars were registered in 2014, roughly one-third more than in the entire EU. There are now over 30 cities in China with more than one million cars.

**Urbanization.** The share of people living in cities is rising. While this applied to only 2 % of the world's population in the year 1800, the year 2007 marked the first time when over half of all people on the planet resided in cities. Forecasts predict that the share of the urban population will rise to 60 % by 2030 and reach 70 % by 2050. Already by 2025, there will then be 40 mega-cities with over 10 million residents. This growth dynamic also places fundamental challenges on the urban transportation infrastructure and promotes investments in intelligent, sustainably designed transportation systems.

**Climate protection.** More than one quarter of the energy consumption and CO<sub>2</sub> emissions in Europe can be attributed to the transportation sector and 20 % to road traffic. Today, 64 % of all kilometers driven are traveled in urban areas. In Vienna, roughly one-third of transportation-related CO<sub>2</sub> emissions result from the search for parking alone. The total number of kilometers driven in urban areas per year should almost triple between 2010 and 2050, rising from 25.8 billion to 67.1 billion. City residents in the year 2050 will then spend 106 hours per year in traffic jams. In addition to the statutory requirements for the automotive industry intended to decrease CO<sub>2</sub> emissions, substantial improvements require changes to user behavior and, above all, intelligent transportation control systems.

**Expansion and financing of transportation networks.** The basic need for mobility, the increasing urbanization and ever higher volumes of goods traffic in global economic trade reveal the limits of the current transportation systems. Highways that were built decades ago no longer live up to the demands placed on them today. Despite intensive efforts to make rail transport more attractive, the volume of freight traffic on Europe's roads has remained at the same level for years.

The willingness of governments to invest in the expansion of transportation networks depends on reliable financing opportunities, among other factors. While investments in the highway network increased over the past decade in Austria, stagnation has been observed in other countries such as Germany, Japan and Great Britain.

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The maintenance and expansion of the road network requires new financing models.

The Trans-European Road Network (TEN-V) made up roughly one-fourth of the entire primary road network in the European Union in 2015 with a total length of 84,700 km but carried only 40 % of the goods transported by road. By 2020, an average expansion of 4,800 km per year is expected, of which 3,500 km will involve existing roads. The new EU Member States in particular as well as the corridors to these countries are expected to require higher levels of investment. In "Whitepaper: European transport policy for 2010", the European Commission indicated that investment costs up to 2020 will amount to EUR 600 billion. The increase in traffic volumes can therefore be expected to continue over the long term. In addition to the construction of new infrastructure, it is also important to finance the maintenance and repair of existing roads.

In the U.S.A., roughly USD 55 billion are invested every year in the road network. Experts estimate, however, that at least a doubling of investments to over 100 billion U.S. dollars will be necessary in the coming years in order to maintain the functionality of the road network. This pronounced need for financing inspires changing business models and increases willingness to adopt private concession models.

In consideration of tight state budgets, alternative financing models with the participation of private investors will continue to increase in importance in the coming years. Toll systems and traffic management systems will take on greater importance in the future to ensure the economical operation of highways.

### **Technology**

The ITS market and associated factors are characterized by new technologies and short technology cycles. These changes open up new perspectives for Kapsch TrafficCom. It is necessary to intelligently resolve the apparent conflict between transportation developments on one side and the opportunities presented by mobility on the other. Through the use of technological and organizational measures, the demand for transportation must be met in ways that do not negatively impact the environment or economic development. Kapsch TrafficCom will continue to make important contributions toward this goal.

### **Intelligent mobility solutions**

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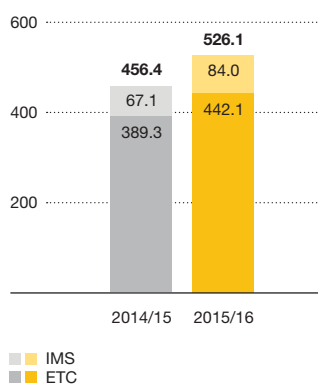
The future will belong to intelligent, holistic mobility solutions.

A process of convergence has been under way in the ITS market during recent years as the individual market segments increasingly merge. In expectation of this convergence, even if not at the same pace, Kapsch TrafficCom is developing from a pure provider of electronic toll collection (ETC) systems to a provider of selected ITS applications. Kapsch TrafficCom expects that the future will belong to intelligent, holistic mobility solutions and strives to play a leading role in this future. This goal is anchored in Strategy 2020 with the establishment of an intelligent mobility solutions (IMS) business. In pursuit of this goal, end customers will be addressed more heavily in the future and the portfolio will be expanded from the highway into the city.

## 2 Economic Position of the Kapsch TrafficCom Group.

### 2.1 Business Development

#### Revenue growth by 15.3% (in million EUR)



The 2015/16 fiscal year was characterized by numerous new orders.

In the 2015/16 fiscal year, the Kapsch TrafficCom Group achieved a revenue of EUR 526.1 million, a 15.3 % increase compared to the previous year. The segment Electronic Toll Collection (ETC), which reflects the core business in toll collection was responsible for 84.0 % of the revenue (previous year: 85.3 %). The segment Intelligent Mobility Solutions (IMS) contributed a larger share of revenue during the reporting year than during the previous year at 16.0 % (previous year: 14.7 %). In addition to existing major projects in Belarus and the USA that shaped the 2015/16 fiscal year, new projects were acquired, project progress was made and new partnerships were concluded. The most significant of these developments are described below:

- ▶ In May 2015, Kapsch TrafficCom was awarded the installation and operation of a toll system for the Louisville-Southern Indiana Ohio River bridges. The extensive project encompasses the installation, integration, operation and maintenance of an electronic toll system for multi-lane, free-flow traffic as well as the operation of a back office system and a customer service center for three bridges. The total value of the project amounts to USD 41 million (roughly EUR 36.7 million). The toll system should enter into operation at the end of 2016.
- ▶ In the city of Prato in Tuscany, Italy, the system installed by Kapsch TrafficCom for monitoring the traffic-calmed zone entered into operation. Since the start of July 2015, the new automated access control system has controlled access to the city center. The purpose of this and similar systems throughout Italy is to protect the historic heritage of the cities as well as the environment.
- ▶ On 17 August 2015, Kapsch TrafficCom received an order for the further expansion of the toll road network in Belarus. In total, the toll system BelToll should be expanded over ten months by 323 km from a previous 1,200 km to over 1,500 km. Kapsch TrafficCom is both developer and operator of the toll system. An operating period of 20 years is planned.
- ▶ Kapsch TrafficCom received from the Dutch authority for road construction and operation Rijkswaterstaat on 18 August 2015 and from the English authority for road construction and operation Highways England on 7 October 2015 the order for delivery of the advanced traffic management system DYNAC for the cross-border program "CHARM". This is a joint program by the English and Dutch authorities. The goal is comprehensive modernization and consolidation of the traffic management on the highways within 26 months. The order volume amounts to a total of roughly EUR 60 million and also includes services for a period of up to 13 years after successful implementation of the system.
- ▶ In September 2015, additional orders were obtained in Chile: On over 900 highway kilometers of the famous Panamericana Ruta 5, Kapsch TrafficCom will technically upgrade the existing toll system and take over maintenance of the new system for five years. The order value amounts to over EUR 9 million. In addition, an order for installation of a toll system and intelligent transportation system (ITS) was received for a 15 km section of Ruta 5 Norte north of Santiago de Chile. The operator of the road is the Sociedad Concesionaria Autopista del Aconcagua (SCADA). The order value amounts to roughly EUR 20 million, including maintenance of the systems.
- ▶ On 29 October 2015, Kapsch TrafficCom, together with its consortium partner, received the order for the collection and analysis of traffic data in Prague, Czech Republic. The project, which has an order value of approximately EUR 6.5 million, encompasses the expansion of the traffic management system to include selected areas of the city of Prague on the basis of intelligent traffic cameras with additional sensors. In addition, Kapsch TrafficCom will be delivering V2X radio modules for communication between vehicles (vehicle-to-vehicle) and between vehicles and infrastructure (vehicle-to-infrastructure) as well as vehicle-internal platforms.
- ▶ On 14 December 2015, Kapsch TrafficCom concluded an agreement with Schneider Electric S.E. concerning an acquisition of its global transportation business. The transportation segment, which previously operated under the name Telvent Tráfico y Transporte, is a provider of real-time IT solutions and intelligent traffic systems for use in cities, on highways and in tunnels. The portfolio also includes tolling and transit solutions. The acquisition will enable Kapsch TrafficCom to offer existing and future customers an integrated portfolio

of intelligent transportation solutions from the highway into the city. With revenue of roughly EUR 125 million, the global transportation business of Schneider will contribute to further expansion of the business volume of Kapsch TrafficCom while also strengthening the efforts of Strategy 2020 in the area of intelligent mobility solutions (IMS). The conclusion of the acquisition took place on 1 April 2016.

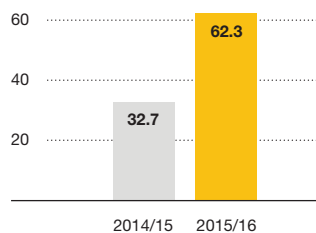
- ▶ On 24 March 2016, Kapsch TrafficCom announced that its subsidiary Kapsch TrafficCom Australia Pty Ltd. was commissioned with replacing the existing toll system of the Sydney Harbour Bridge and the Sydney Harbour Tunnels. The bridge and tunnel are operated by the New South Wales Roads and Maritime Services (RMS). The contract with an order value of over EUR 10 million encompasses the installation of a new toll system as well as its maintenance for five years. The new toll system should enter into operation at the start of 2017.

The following significant official changes and events took place in the 2015/16 fiscal year:

- ▶ On 14 April 2015, a controlling interest in the Californian company Streetline, Inc., USA, was acquired through a merger with the newly founded KTCSL Merger Corp., Delaware, USA. Streetline is a leading smart parking company that develops and offers intelligent data and modern analytics to solve parking space problems for end users.

## 2.2 Earnings situation

**EBIT increase by 90.4 %**  
(in million EUR)



**The revenue** of the Kapsch TrafficCom Group reached EUR 526.1 million in the 2015/16 fiscal year, which is 15.3 % above the previous year's value of EUR 456.4 million.

**The operating result (EBIT)** of the Kapsch TrafficCom Group was EUR 62.3 million, which exceeds the previous year's EBIT by 90.4 % (EUR 32.7 million). The EBIT margin rose to 11.9 % (previous year: 7.2 %).

### Revenue and operating result (EBIT) by segments

With the adaptations to the strategy and structure of the Kapsch TrafficCom Group in the 2015/16 fiscal year, the previous segmentation no longer served as a suitable breakdown of the business development and was no longer useful in company controlling. Since the fourth quarter of the fiscal year, Kapsch TrafficCom has therefore begun reporting both internally and externally based on the two segments of Electronic Toll Collection (ETC) and Intelligent Mobility Solutions (IMS).

The effects of Program 2020 can be seen in the improved profit and particularly in the new strategy.

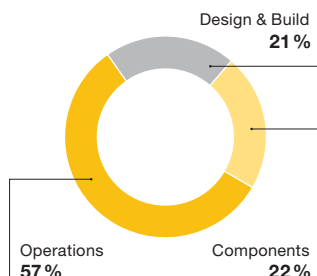
Within both segments, a differentiation is made between projects for installation (Design & Build), projects for technical and commercial operation of the systems, including maintenance, (Operations) and deliveries of components (Components). Components encompass the three product families of on-board units and transponders, transceivers and readers as well as cameras and sensors.

**Electronic Toll Collection (ETC).** This segment reflects projects for the installation, maintenance and operation of systems for electronic collection of tolls without stopping at a toll station as well as manual toll systems. These are generally projects awarded based on invitations to tender by public agencies or private concessionaires. The systems cover either individual road sections or nationwide road networks. After installation, additional deliveries of components frequently take place for the expansion or adaptation of the systems.

*In fiscal year 2015/16,* revenue of the segment ETC increased by 13.6 % from EUR 389.3 million to EUR 442.1 million. The largest share of the revenue came from the region EMEA (Europe, Middle East, Africa) with the operations projects in the Czech Republic, Poland, Belarus and South Africa. In the area of Design & Build projects, the further expansion of the truck toll system in Belarus made a significant contribution to the increased revenue. In the EMEA region, component revenues also increased over the previous year thanks to increased sales of on-board units in France and the Czech Republic.

### Revenue distribution ETC

(in %)



In the Americas region, Components also contributed significantly to the positive revenue development. After sales of 4.3 million on-board units in the USA (previous year: 3.6 million units), revenue exceeded the previous year. In the area of Design & Build projects, the managed lane systems in Texas and for the New York State Thruway Authority made significant contributions to increased revenue, while revenue from Operations projects declined due to fewer maintenance orders in Chile compared with the previous year.

In the APAC (Asia-Pacific) region, revenues from Design & Build projects increased considerably compared to the previous year, driven in particular by the project obtained in the previous year for the installation of an electronic toll system in Sydney, Australia (WestConnex). Significant revenue increases over the previous year were also achieved in the area of Components, in particular due to on-board unit sales in Thailand and Australia. The Operations projects on the other hand made a lower contribution to revenue for the APAC region than in the previous year due to fewer maintenance orders in Australia.

The number of on-board units sold, which make up the majority of revenue in the Components area, was significantly above the previous year's level of 7.4 units at 9.5 million units. Sales figures increased in France, the Czech Republic, North America, Thailand and Australia. In contrast, lower sales numbers were recorded during the reporting period in Chile.

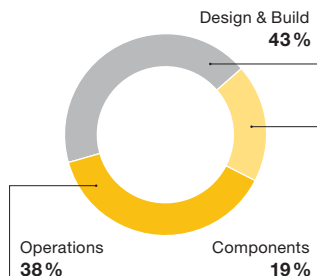
In the segment ETC, new Design & Build projects and components sales contributed to the increased revenue and EBIT.

The EBIT of the segment ETC was EUR 63.7 million after EUR 33.5 million in the previous year. The EBIT margin rose as a result to 14.4% (previous year 8.6%). This positive development resulted in part from the higher profit contributions of the Operations projects in Belarus, Poland and the Czech Republic. The technical operation and maintenance of the nationwide system in Austria also made a good profit contribution. The Design & Build projects, such as the expansion for phase 3a in Belarus, and the increased components sales also contributed positively to the profit development. In particular, however, this EBIT improvement also reflects the success of the project "Top Fit" for cost reduction and increased earnings.

Segment Electronic Toll Collection (ETC)		2014/15	2015/16	+/-
<b>Revenue</b>	in million EUR	<b>389.3</b>	<b>442.1</b>	<b>13.6 %</b>
Design & Build	in million EUR	61.4	92.3	50.3 %
Operations	in million EUR	248.3	252.1	1.5 %
Components	in million EUR	79.6	97.7	22.9 %
<b>EBIT</b>	in million EUR	<b>33.5</b>	<b>63.7</b>	<b>90.0 %</b>

### Revenue distribution IMS

(in %)



**Intelligent Mobility Solutions (IMS).** This segment reflects projects for the installation, maintenance and operation of systems for traffic monitoring, traffic control and traffic safety. Projects for the monitoring of utility vehicles and for electronic vehicle registration as well as intelligent parking solutions and systems for intermodal mobility are also assigned to this segment as are systems and services for operational monitoring of public transportation and environmental installations.

In fiscal year 2015/16, revenue of the segment IMS increased by 25.1% from EUR 67.1 million to EUR 84.0 million. In the region EMEA (Europe, Middle East, Africa), significant contributions to increased revenue came from the Design & Build projects obtained in the previous year, such as the project for expansion of the traffic management system in the Czech capital of Prague and the cross-border program "CHARM" for the advanced traffic management system DYNAC being implemented in both England and the Netherlands. In the area of Operations, the main revenue contributions for the EMEA region came from the operation of the traffic management systems in South Africa and the Czech Republic. In Components, however, the production and deliveries for the French GSM-R project of Kapsch CarrierCom declined compared with the previous year.



In the Americas region, the revenues from the Design & Build projects were significantly below the comparison values of the previous year due to the advanced stage of completion of many projects. In the area of Operations projects, the revenue contribution from projects of the newly acquired Streetline, Inc., U.S.A. as well as newly obtained maintenance orders were apparent among other revenue sources. In addition, the revenue from Components increased due to the higher sales of on-board units for monitoring utility vehicles in the U.S.A.

In the APAC (Asia-Pacific) region as well, the high degree of completion of the Design & Build projects in Australia and New Zealand was reflected in the revenue developments. The Operations revenue from the operation of traffic monitoring systems in Australia and New Zealand remained stable in comparison with the previous year.

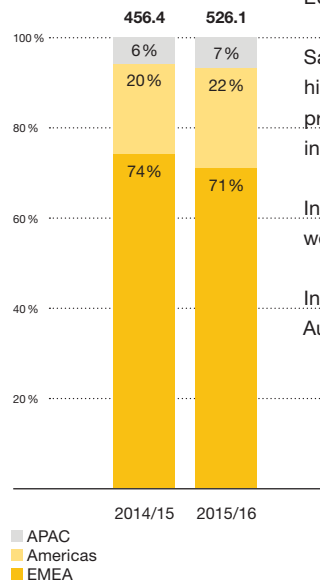
The segment IMS reflects growth but also the investments in new solutions.

The EBIT of the segment IMS was EUR -1.3 million (previous year: EUR -0.8 million) which puts the EBIT margin at -1.6 % (previous year: -1.1 %). This decline is related to the decreased revenue from component sales as well as the lower revenue contributions from the North American IMS Design & Build projects. Consequently, the expenditures attributed to this segment for development work as well as the costs for the newly acquired Streetline, Inc., U.S.A., could not be covered.

Segment Intelligent Mobility Solutions (IMS)		2014/15	2015/16	+/-
<b>Revenue</b>	in million EUR	<b>67.1</b>	<b>84.0</b>	<b>25.1 %</b>
Design & Build	in million EUR	26.6	36.1	35.7 %
Operations	in million EUR	21.0	32.3	53.8 %
Components	in million EUR	19.5	15.6	-20.0 %
<b>EBIT</b>	in million EUR	<b>-0.8</b>	<b>-1.3</b>	<b>-62.5 %</b>

### Revenue by region

#### Revenues by region (in %)



The largest share of total revenue in the 2015/16 fiscal year was once again held by the EMEA region (Europe, Middle East, Africa) at 70.7 % (previous year: 73.6 %). The revenue in EMEA increased by 10.7 % to EUR 372.0 million, largely due to higher revenues in Belarus, the Czech Republic and the Netherlands.

Sales in the Americas region increased by 27.7 % to EUR 118.2 million. This can be attributed primarily to the higher on-board unit sales, the project progress in the implementation of the New York State Thruway Authority project as well as the revenue contributions from the projects of the newly acquired Streetline, Inc., USA. The installation and operation project in Puerto Rico also contributed to increased revenue.

In the APAC region (Asia-Pacific), revenue increased by 29.7 % to EUR 35.9 million. The factors behind this rise were higher on-board unit sales in Thailand as well as higher revenues in the installation projects in Australia.

In Austria, revenue increased over the previous year by 4.2 % to EUR 39.8 million due to the deliveries for the Austrian GSM-R projects of the Kapsch CarrierCom Group.

Revenue by region		2014/15	2015/16	+/-
<b>EMEA</b>	in million EUR	<b>336.1</b>	<b>372.0</b>	<b>10.7 %</b>
Design & Build	in million EUR	31.6	58.2	84.5 %
Operations	in million EUR	252.7	264.2	4.5 %
Components	in million EUR	51.9	49.6	-4.4 %
<b>of which Austria</b>	in million EUR	<b>38.2</b>	<b>39.8</b>	<b>4.2 %</b>
<b>Americas</b>	in million EUR	<b>92.6</b>	<b>118.2</b>	<b>27.7 %</b>
Design & Build	in million EUR	40.1	49.8	24.0 %
Operations	in million EUR	12.3	16.3	32.1 %
Components	in million EUR	40.1	52.2	30.0 %
<b>Asia-Pacific</b>	in million EUR	<b>27.7</b>	<b>35.9</b>	<b>29.7 %</b>
Design & Build	in million EUR	16.3	20.4	25.0 %
Operations	in million EUR	4.3	4.0	-7.4 %
Components	in million EUR	7.1	11.6	63.5 %
<b>Total</b>	in million EUR	<b>456.4</b>	<b>526.1</b>	<b>15.3 %</b>

#### Key items in the statement of comprehensive income

The costs in relation to revenue reflect the effectiveness of the project "Top Fit".

**The cost of material and other production services** increased by EUR 33.9 million to EUR 201.9 million (previous year: EUR 168.0 million), and it should be noted that an extraordinary one-time effect in the amount of EUR 16.1 million reduced the expenses in the previous year. The ratio of costs for materials and other production services to sales revenue therefore increased from 36.8 % to 38.4 %.

**Staff costs** increased by EUR 5.1 million to EUR 153.2 million (previous year: EUR 148.1 million). At the same time, the average number of employees grew by four persons, changing from 3,510 to 3,514 in the reporting period. The staff cost ratio (staff costs with respect to total revenues) nevertheless fell from 32.5 % in the previous year to 29.1 %. The project "Top Fit" with measures for improving profitability also led to the planned savings in the European parent companies. The increase in the staff costs compared with the previous year can largely be attributed to the further expansion of the Polish operation company and the acquisition of Streetline, Inc., U.S.A.

**Depreciation and amortization expenses** decreased by EUR 1.9 million to EUR 14.5 million (previous year: EUR 16.4 million). No unscheduled depreciations or impairments occurred in the fiscal year.

**Other operating expenses** increased by EUR 4.9 million to EUR 99.6 million (previous year: EUR 94.8 million). The ratio of other operating expenses to total revenue nevertheless decreased compared with the previous year from 20.8 % to 18.9 %. Higher expenses were recorded for legal and consulting expenses, travel costs and operational currency losses, while the costs from damages were lower and the costs for reorganization declined again.

The financial result also improved considerably compared with the previous year.

**The financial result** improved from EUR -13.1 million in the previous year to EUR -7.6 million. The finance income decreased slightly, primarily due to the lower compounding of the receivables from the installation of the Belorussian toll system.

The finance costs declined significantly because no large impairments occurred in this fiscal year, in contrast with the previous year. However, the unrealized foreign exchange gains and foreign exchange losses from the conversion of the Group-internal financing of the subsidiaries in South Africa by the parent company weighed more heavily on the financial result than in the previous year.

**The profit from joint ventures and associated companies** decreased to EUR 0.0 million (previous year: EUR 0.2 million) and resulted from the stake in Simex, Integración de Sistemas, S.A.P.I. de C.V., Mexico.

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**The profit before taxes** increased by a considerable EUR 34.9 million to EUR 54.8 million (previous year: EUR 19.9 million) as a result of these developments.

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The profit per share increased to EUR 2.39.

**The profit for the period** improved by EUR 25.1 million to EUR 36.5 million EUR (previous year: EUR 11.4 million), of which EUR 31.1 million (previous year: EUR 3.6 million) is attributable to the equity holders of the company. This put the profit per share at EUR 2.39 (previous year: EUR 0.28).

### 2.3 Assets and liabilities

**The balance sheet total** decreased by EUR 1.9 million to EUR 513.7 million at the close of the period on 31 March 2016 (31 March 2015: EUR 515.6 million).

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The equity ratio increased again by 2.4 percentage points.

**The equity** increased by EUR 11.3 million to EUR 230.7 million (previous year: EUR 219.4 million). As a result, the equity ratio of the Kapsch TrafficCom Group improved from 42.5% on 31 March 2015 to 44.9% on 31 March 2016.

Beside an increase in cash and cash equivalents (by EUR 44.0 million), **the largest change in assets** concerns the inventories. These decreased by EUR 11.9 million to EUR 35.8 million on 31 March 2016, a change that can be primarily attributed to inventory optimization and rationalization during the fiscal year. Of particular note here is the reduction in the stock levels in Austria, Poland, the Czech Republic and Belarus.

Other non-current assets decreased by EUR 9.3 million. This is largely due to the contractually agreed repayment from the Belorussian installation project over a period of 36 months, starting in August 2013 as well as the associated shift toward current trade receivables. The intangible assets declined by EUR 6.3 million, mainly due to the scheduled depreciation.

Under current assets, the trade receivables and other current assets fell by EUR 5.9 million, in which trade receivables decreased by EUR 21.3 million due to date-related fluctuations. The change of receivables from projects exerted an opposing influence, which increased by EUR 14.4 million compared to prior year.

Other current financial assets decreased by EUR 5.2 million to EUR 0.1 million, due to the sale of joint ownership shares (ESPA Cash Asset-Backed).

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The balance sheet reflects the repayment of significant amounts of project financing.

**The largest change on the liabilities side** occurred in the current financial liabilities, which declined by EUR 27.6 million to EUR 21.3 million. This is due to the ongoing repayment of financing, with EUR 20.3 million relating to the repayment of the financing in connection with the installation of the nationwide electronic truck toll system in Belarus.

Non-current financial liabilities decreased by EUR 3.3 million to EUR 85.7 million. This is due in part to the buyback of the corporate bond in the amount of EUR 4.2 million. Another factor here is the change in reporting category of the financing for the project in Belarus from non-current to current. EUR 14.5 million that is reported in the current liabilities on the balance sheet date was reported as non-current in the previous year.

Other current liabilities and deferred income, which amounted to EUR 79.3 on the balance sheet date, increased by EUR 13.8 million compared to the previous year (previous year: EUR 65.5 million). This is primarily due to an obligation of TMT Services and Supplies (Pty) Ltd., South Africa, against minority shareholders in the amount of EUR 6.2 million. Moreover current personnel liabilities rose by EUR 3.3 million as well as obligations from projects (increase by EUR 2.6 million) relative to 31 March 2015.

The trade payables amount to EUR 52.0 million, having remained stable in comparison with the previous year (EUR 48.4 million).

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## 2.4 Financial position

**The net cash flow from operating activities** amounted to EUR 97.9 million in the reporting period (previous year: EUR 75.2 million). This development is mainly caused due to the strong profit from operating activities, a decrease in non-current assets (EUR 22.5 million) and in inventories (EUR 11.9 million) as well as due to an increase in trade payables and other current liabilities (EUR 12.9 million).

**The improvement in the net cash flow from investing activities** by EUR 8.0 million to EUR 0.6 million following EUR -7.4 million in the previous year is basically due to the sale of securities as well as the cash inflow from the acquisition of the stake in Streetline, Inc., U.S.A.

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The free cash flow increased to EUR 90.7 million.

**The free cash flow** developed extraordinarily well as a result of the increased net cash flow from operating activities and was positive at EUR 90.7 million (previous year: EUR 68.2 million).

**The net cash flow from financing activities** was EUR -49.6 million (previous year: EUR -31.9 million) due to the decline in current financial liabilities amounting to EUR 32.9 million, dividend payments amounting to EUR 13.2 million as well as payments for the acquisition of non-controlling interests amounting to EUR 6.7 million.

**Cash and cash equivalents** reached a record level of EUR 140.8 million on 31 March 2016 (31 March 2015: EUR 96.8 million). The decrease in non-current financial liabilities and the increase in cash and cash equivalents led to a surplus on 31 March 2016 and therefore a net credit in the amount of EUR 33.8 million (31 March 2015: net debt of EUR -35.9 million).

## 3 Additional Company Information.

### 3.1 Research and development

The Kapsch TrafficCom Group has a global network of research and development centers in Vienna and Klagenfurt (Austria), Jonkoping (Sweden), Buenos Aires (Argentina), Mississauga (Canada), Kingston, Duluth, Pleasanton and San Mateo (U.S.A.). In the course of restructuring the organization, the Research and Development department took over end-to-end responsibility for development, including responsibility for the system architecture and final internal approval of the developed solutions. On 31 March 2016, Kapsch TrafficCom employed roughly 430 engineers (previous year: 470, adjusted) for its research and development activities.

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The development departments for all strategic business fields ensure strong innovation.

Research and development (R&D) are a high priority for Kapsch TrafficCom with respect to achieving our strategic goals. To ensure the inventiveness of the company, development departments exist for all strategic business fields to work on new solutions for customer needs.

The following focal areas were defined in the past fiscal year:

The developments in the direction of a modern platform for ETC back office solutions were continued. Special attention was paid here to the integration and application of new technologies (e.g. data analytics tools, open source standard components).

In addition, the various roadside platforms of Kapsch TrafficCom were improved and a program was started to gradually merge the various product lines.

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Investments continue to be made in improving vehicle identification and classification sensors. The new developments are capable of increasing the measurement accuracy, thereby optimizing the overall performance of our solutions.

For the Italian market, Kapsch TrafficCom is developing DSRC components (on-board unit and transceiver), that support the special Italian radio standard ETSI-TS 102 708, HDR (High Data Rate). The basic development and certification of the transceiver have been completed, and the on-board unit is planned for fiscal year 2017.

The satellite-based toll system of Kapsch TrafficCom is gaining in importance due to changes in the toll market. By integrating smartphones and other devices in addition to GNSS on-board units, the scope of functionality as well as the range of applications for our satellite-based toll solution have been expanded. The modernization of the technologies employed ensures that Kapsch TrafficCom has a future-proof solution that can live up to the requirements of a combined ETC/ITS market through modularity and flexibility.

In cooperative systems (V2X), the focus lay in part on further development of the Kapsch traffic management solutions for vehicle-to-vehicle and vehicle-to-infrastructure integration within the scope of the research project "European Corridor". Participation in research projects in cooperation with the automotive industry led to close contact with leading automotive manufacturers and first tier automotive suppliers. The activities in the area of V2X vehicle equipment and the available products were also improved further. In addition to developing a product and solution portfolio for cooperative systems, Kapsch TrafficCom is also taking an active part in the required standardization process in the USA and in Europe.

In the area of smart parking, the subsidiary "Streetline" invested in a new procedure for inexpensive collection of parking space data that reduces the number of required field sensors to a minimum.

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Roughly 11 % of the total revenue is invested in research and development.

In the 2015/16 fiscal year, the Kapsch TrafficCom Group invested roughly EUR 56.6 million in research and development (previous year: roughly EUR 49.0 million), of which EUR 32.4 million for customer-specific development (previous year: EUR 22.0 million). The total expenditures for research and development correspond to roughly 11 % (previous year: roughly 11 %) of total revenue.

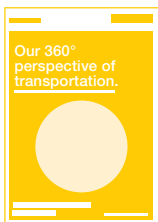
### 3.2 Non-financial performance indicators

#### Sustainability management

Kapsch TrafficCom sees itself as particularly committed to the central aspects of sustainability not least due to the business model of the company. By means of these products and solutions, we make an active contribution to the environmentally and resource-sensitive management of transportation systems and, therefore, to the sustainable development of our society. We are also constantly endeavoring to minimize our consumption of resources and any environmental impacts related to our own business activities.

**Consistent sustainability orientation.** Kapsch TrafficCom understands sustainability as a continuous process. In recent years, the company has begun systematizing all the related agendas. One important milestone was reached with the publishing of the fourth sustainability report in the year 2016, which is available at [www.kapsch.net/ktc/investor\\_relations](http://www.kapsch.net/ktc/investor_relations).

The sustainability report satisfies the requirements of the Global Reporting Initiative, GRI Guideline G3.1 (Application Level C). It also serves as a progress report for the United Nations Global Compact, which defines ten principles for protecting human rights and labor standards as well as environmental protection and fighting corruption.



Sustainability report 2014/15

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The report provides comprehensive information about the central fields of action:

- ▶ Protecting the environment, conserving resources and actively protecting the climate
- ▶ Securing the innovative strength
- ▶ Product responsibility and quality assurance
- ▶ Ensuring the competitiveness and profitability
- ▶ Integrity and compliance
- ▶ Being an attractive and responsible employer

Figures for success measurement as well as goals for the following period have been defined for each field of action. All such agendas are coordinated by a sustainability officer and reported to the executive board.

#### **Innovative products with added value for the environment and society**

The products and solutions for intelligent transportation systems from Kapsch TrafficCom make valuable contributions to climate protection. They allow road users to reach their destinations quickly, efficiently and with low environmental impact. In order that these ambitions can be realized in the future, Kapsch TrafficCom invests heavily in research and development – in fiscal year 2015/16, and spent roughly 11 % (previous year: approximately 11 %) of the total revenue in this area.

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The requirements for development and design of the products also include sustainability aspects.

Comprehensive guidelines were created to ensure that environmental, economic, social, health and safety aspects are ideally taken into account in a structured fashion in the design of products. The contents of these guidelines must be integrated into the specifications and project invitations to tender.

**Quality.** Safeguarding the high standards of quality, safety and robust processes is a high priority in all units of the Kapsch TrafficCom Group. Kapsch TrafficCom AG defines its processes in an integrated HSSEQ management system (Health, Safety, Security, Environment, Quality). This system is based on certifications according to ISO 9001 Quality Management (since 2002) as well as OHSAS 18001 Occupational Health and Safety Management and ISO 14001 Environmental Management (since 2005). Kapsch TrafficCom has anchored the necessary measures for ensuring the associated standards into its internal processes and continuously monitors compliance. The certificate according to ISO 27001 defines the required information security management. A high service quality is ensured in the area of technical operation with ISO 20000 for IT service management. The HSSEQ Circle meets once per quarter to discuss the status of the goals and measures from the areas of health and safety, quality, the environment and information security and to optimize work processes and information sharing. These aspects are documented in a quarterly report to the executive board.

**Reliability and accuracy of installed systems.** The toll transaction rate is a figure for assessing the accuracy and reliability of a toll collection system. It indicates the number of successful transactions in relation to all potential toll transactions of vehicles equipped with a functioning on-board unit. A high toll transaction rate translates to high toll income. The average toll transaction rate of the existing truck toll collection system in Austria was at approximately 99.89 % in 2014 (2013: 99.83 %), the average transaction rate of the nationwide electronic toll collection system in the Czech Republic was approximately 99.6 % 2014 (2013: 99.6 %). The calculation of the average transaction rate is based on methods agreed upon with the respective customer, meaning that comparisons between the average transaction rates achieved in different projects are only possible on a limited basis.

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### Protecting the environment, conserving resources and actively protecting the climate

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Innovation and quality also include improvements in energy efficiency.

The business activities are associated with the consumption of raw materials and the emission of climate-relevant emissions. Kapsch TrafficCom works intensively on minimizing these impacts. The majority of the climate-relevant effects result from the business activities of the subsidiary Kapsch Components, which is responsible for production as well as the fleet of the entire group. Through measures to increase energy efficiency, but also influenced by a lower production volume, Kapsch Components was able to reduce its energy consumption by 9.5 % in fiscal year 2015/16 following a reduction of 7 % in the previous year. The waste volume per ton of product has increased by 28,1 % to 173kg and the nitrogen consumption sank by 3,8 %.

### Ensuring the necessary team competence

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Kapsch TrafficCom is positioned internationally as an attractive employer.

**Staff.** The average number of employees in the Kapsch TrafficCom Group in fiscal year 2015/16 was 3,514, which is 0 % higher than the average of 3,510 in fiscal year 2014/15. As of 31 March 2016, the group had a workforce of 3,716 (3,534 salaried and 182 non-salaried employees), of which more than half were located outside of Europe – roughly 1,400 employees in South Africa only.

*Training and education.* Kapsch TrafficCom attaches significant importance to the training of its personnel given that their knowledge and problem-solving skills represent a key success factor. In the fiscal year 2014/15, employees received an average of 4.5 days of training. Besides specialist training, soft skills are also conveyed as part of the training programs run by Kapsch TrafficCom. A job-rotation program, a tailored range of course for trainees and annual staff appraisals are also offered.

*Pension fund.* Kapsch TrafficCom makes contributions to an external pension fund for employees of group companies in Austria under a defined contribution scheme. The amounts of the payments are based on the individual employee's income and the operating profit margin of the company.

*Profit participation.* Kapsch TrafficCom is aware of the employees' contribution to its success and acknowledges this through a profit participation plan. The Kapsch TrafficCom Group rewards the commitment of its employees by distributing to them up to 5 % of the group profit before income taxes. Country-specific upper limits have been established to ensure that the distribution reflects local purchasing power. Every employee receives a share, which is independent of the person's salary or wage and limited to EUR 1,500 per employee.

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Providing equal opportunities for women and supporting women in their careers are important goals at Kapsch TrafficCom.

*Advancement of women.* Kapsch TrafficCom is committed to promoting the advancement of women in the workplace. Women are supported through a flexible working hours scheme that is designed to help combine professional and private life. In addition, Kapsch TrafficCom cooperates with schools, universities and universities of applied sciences in order to increase the proportion of women employed, among other goals. The company also promotes women in the workforce through participation in specific programs such as "FIT Frauen in die Technik" or "FemTech". A committee for non-discrimination has been established within the Kapsch TrafficCom Group.

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Social responsibility also includes ethically, morally and legally correct behavior.

### Social responsibility

**The framework.** Alongside statutory requirements and internal guidelines, the code of conduct of the Kapsch Group defines binding principles for ethically, morally and legally correct behavior that apply therefore to all corporate units – and therefore to all employees of Kapsch TrafficCom. The code of conduct can be found on the website [www.kapsch.net](http://www.kapsch.net).

Additionally, within the scope of internal risk management, all business units over which Kapsch TrafficCom AG has primary influence are audited with regard to their corruption risks, and the employees of the first and second management levels are trained in anti-corruption policy and anti-corruption processes.

In accordance with the corporate values, the Kapsch TrafficCom Group accepts social responsibility that extends even beyond its scope of operation and that is widely organized by the Kapsch Group. Only a selection of supported projects and initiatives are presented below.

**Educational institutions.** Technical educational institutions are very important to Kapsch as a technology- and innovation-oriented group. The company is therefore interested in establishing contact as early as possible with students as well as graduates of technical education programs. Alongside the Vienna University of Technology and the UAS Technikum Wien, the Kapsch Group has also subsidized the Universitäre Gründerservice Wien GmbH since 2005. This organization aids young entrepreneurs in transforming ideas into convincing business concepts.

**Promoting social projects.** Kapsch TrafficCom values and supports the work of charitable institutions such as the Institute for Cooperation in Development Projects (ICEP). This private, independent initiative – based in Austria – significantly contributes to combating global poverty. For many years, Kapsch TrafficCom has also been supporting the activities of Doctors Without Borders, an internationally renowned organization that helps people around the world who do not have adequate access to medical care. Kapsch provides the infrastructure for an annual gathering for the Caritas Socialis initiative and since 2013 sponsors the Next Generation Sequencing project of the St. Anna Children's Cancer Research Institute.

**Support for art and cultural institutions.** The entire Kapsch Group – headed by Kapsch AG – supports many contemporary art and cultural institutions and projects and even initiates its own projects in this sector.

The Kapsch Group has participated in a general partnership with the Vienna Concert Hall (Wiener Konzerthaus) since 1992 under the motto of "It is an art to make money. It is an obligation to spend money on art." The Vienna Concert Hall offers plenty of space for all culture of high quality. Unusual programs regularly interest new segments of the public without alienating long-term friends of the Concert Hall. The festival "Wien modern" – one of the most famous contemporary music festivals in the world has been supported since 1989.

In the area of visual arts, Kapsch is particularly interested in supporting artists who are still in need of wider recognition. Consideration is therefore given to young artists from Austria and abroad with sponsorship campaigns. The showcase project in this area is the art calendar that the Kapsch Group has published since 1994 and presents annually in late autumn to great fanfare.



Art Calendar  
2016

### 3.3 Risk management

Risk management is positioned as its own function within the financial department of Kapsch TrafficCom AG. The main focus of risk management is on project risk management and enterprise risk management (ERM).

**The project management** encompasses both external customer projects as well as internal development projects and begins in each case during the offer or initiation phase. An analysis of all relevant risks and



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opportunities is prepared based on institutionalized processes and supplies the basis for decisions as well as timely planning and implementation of controlling measures.

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Risk management entails the identification and analysis of risks and opportunities.

**Enterprise risk management (ERM)** involves the analysis of major project-related risks of the Kapsch TrafficCom Group as well as strategic, technological, organizational, financial, legal and IT risks, and reports are submitted to the executive board, the audit committee of the supervisory board and the first reporting level on a quarterly basis. The ERM approach is aimed at the early identification, assessment and control of the risks that may materially influence the achievement of the strategic and operational goals of the company. The primary objective in this context is not to avoid risks but to deal with risks in a controlled and deliberate manner and to recognize and realize opportunities as they arise over time in order to make a valuable contribution to the management of the company.

The material risks and opportunities of the group and the respective risk management measures are briefly explained below.

#### **Industry-specific risks**

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Geographic diversification and expansion of the product portfolio contributes to stabilizing and increasing revenue.

**Volatility of new orders.** An important part of the revenue of the Kapsch TrafficCom Group is earned in the segment of Electronic Toll Collection (ETC). This segment includes projects for the installation of nationwide, regional or route-specific toll systems as well as the technical and commercial operation of toll systems. The awarding of these projects, including their operation, generally takes place on the basis of invitations to tender. Whether or not the Kapsch TrafficCom Group eventually receives the order is subject to a number of uncertain factors inside and outside the group's area of influence. For example invitations to tender for such large projects can be postponed or withdrawn due to political changes or due to complaints or lawsuits by unsuccessful bidders. There is also a risk that the Kapsch TrafficCom Group may not win with its bids for new projects due to technological, financial, formal or other reasons.

In the past, the revenues of the Kapsch TrafficCom Group have been heavily influenced by whether the given fiscal year had any implementation projects in the ETC segment. High revenue figures were recorded for example in the 2010/11 fiscal year (installation of an electronic toll system in the South African province Gauteng) as well as 2011/12 (installation of the nationwide electronic truck toll system in Poland). In fiscal years 2012/13, 2013/14 and 2014/15, significant revenue came from the installation of the nationwide electronic toll system in Belarus, which also made a major contribution to revenue from installation projects in the 2015/16 fiscal year. In addition, installation projects in Texas, U.S.A., (installation of a managed lane system) and in Sydney, Australia (installation of a toll system on specific route sections), contributed significantly to the increased revenue in the ETC segment.

The continuous expansion into new business areas that are compatible with the core business of Kapsch TrafficCom Group is intended not only to increase revenue but also to smooth over revenue spikes in the interest of more stable revenue development. This should be achieved through increasing geographic diversification through further broadening of the customer and product portfolios and through a continuous increase in the share of revenue from operation and maintenance of offered systems. The technical and commercial operation of systems is generally associated with the awarding of the order for installation of the system, but after the installation is complete, the operation represents a longer term and more reliable source of revenue. In previous fiscal years, it has also been possible to continuously increase the revenue from installation projects of smaller scope. Valuable contributions came here from the segment of Intelligent Mobility Solutions (IMS) and from the geographic regions of the U.S.A. and Australia.

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Technical challenges and tight schedules produce typical project risks.

**Risks of project execution.** In connection with the installation of systems, the Kapsch TrafficCom Group is generally contractually obligated to issue performance and delivery date guarantees. Because electronic toll systems and intelligent mobility solutions are frequently ambitious and technologically complex systems that must be implemented within a strict time frame, missed deadlines and/or system and product defects can occur. Unexpected project modifications, a temporary shortage of skilled workers, quality problems, technical problems and performance problems with suppliers or consortium partners may also have a negative impact on the adherence to delivery dates. If the contractual services are not fulfilled or if deadlines are exceeded, penalties and damages usually have to be paid, in some cases even damages for lost toll revenue. Deadlines far exceeded are often covered by contract clauses that can allow the customer to terminate the contract early. A significant delay in a project, a clear failure to meet the contractually agreed performance criteria or failed implementation of a project could also reduce the chances of success in future tenders. There is also the risk that projects of the Kapsch TrafficCom Group cannot be realized at the previously calculated costs. Due to the strong social opposition to toll systems that is sometimes encountered, the risk of a late or limited start to toll collection exists in many projects, which can have further consequences on payment flows and revenue in the operation project.

The Kapsch TrafficCom Group employs project management methods and project risk management procedures based on the IPMA (International Project Management Association) standards in order to minimize such risks in projects.

**Long-term contracts with public agencies.** For many projects, contracts are awarded by public agencies. Framework agreements and service contracts in connection with toll or traffic management projects may include terms and conditions that are not negotiable in a tender process and that may be disadvantageous for the Kapsch TrafficCom Group. Some multi-year contracts contain demanding requirements regarding the targeted performance of the implemented systems, components and processes. Failure to meet these requirements can result in considerable contractual penalties, obligations to pay damages or termination of the contract. On the other hand, in some contracts substantial bonus payments may be earned in the case of over-performance. Moreover, in the case of long-term contracts, the achievable margins can also differ from the original calculations due to changes in costs.

Liabilities arising from contracts may include liabilities regarding customers' loss of profit, product liabilities and other liabilities. While the Kapsch TrafficCom Group aims to include appropriate limitations to its liability in contracts, it is still impossible to guarantee that all contracts contain sufficient limitations to the group's liability or that these limitations can be enforced under applicable law.

### Strategic risks

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An ongoing and consistent innovation process supports the strong market position of the Kapsch TrafficCom Group.

**Ability to innovate.** The strong market position of the Kapsch TrafficCom Group is based to a large extent on its ability to develop state-of-the-art, efficient and reliable systems, components and products. The Kapsch TrafficCom Group is committed to an ongoing and consistent innovation process. In order to maintain its high technological standards, the Kapsch TrafficCom Group invests a considerable portion of its revenues in research and development activities. However, if the group does not succeed in developing innovative systems, components and products that meet the needs of the market, this can be detrimental to the competitive position of the Kapsch TrafficCom Group.

Since the striving for innovation leadership is based to a large extent on technology, internal know-how and intellectual property, the global increase in product piracy and reverse engineering may have negative impacts on the market position of the Kapsch TrafficCom Group. In addition, any failures in protecting these technologies may negatively impact the competitive position. The Kapsch TrafficCom Group therefore places great importance on protecting technologies and the company's internal know-how, such as through patents

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and non-disclosure agreements with contractual parties. Moreover, it is possible that newly developed systems, components, products or services could infringe on the intellectual property rights of third parties.

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The international growth is opening up new opportunities but also poses risks.

**Acquisition and integration of companies as part of the group's growth.** One of the strategic objectives of the Kapsch TrafficCom Group is to expand internationally both through organic growth and via selected acquisitions and joint ventures. In implementing this strategy, the Kapsch TrafficCom Group acquires suitable companies around the world and integrates them into the group. In the course of these acquisitions, it is necessary to overcome a number of challenges in order to achieve the desired goals and synergies and to realize the expected opportunities from the acquisition of new technologies and market know-how.

**Country risk.** Due to the further expansion of business activities in countries outside of Europe, the Kapsch TrafficCom Group is subject to increased political risk in these countries. Significant and unforeseeable political changes can exert a major influence on the ability to implement or operate projects in these countries as well as to make funds available or withdraw them again. Interference with the property rights of the Kapsch TrafficCom Group or problems with business practices and activities may also arise. The Kapsch TrafficCom Group includes these risks in the evaluation of such projects.

#### **Financial risks**

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Financial risks arise from exchange rate and interest fluctuations as well as loans. Sufficient liquidity increases flexibility and the ability to take quick action.

**Foreign exchange risk.** As a global company, the Kapsch TrafficCom Group maintains branches, offices and subsidiaries in many countries outside the eurozone. In the course of implementing projects outside the eurozone, transactions risks arise from possible exchange rate fluctuations that can be reflected in the consolidated financial statements as exchange rate losses or gains. The Kapsch TrafficCom Group strives as far as possible to avoid these transaction risks in the amount of the net currency positions from the respective projects or to hedge them, if necessary. However, because the net currency position at the respective payment flow deadlines is often difficult to predict, hedging is only possible to a limited extent. The remaining exchange rate risk is accepted and included in the business planning. Due to the conversion of individual financial statements of the subsidiaries outside the eurozone into the group currency of the euro, the Kapsch TrafficCom Group is also subject to a translation risk. In addition, long-term disadvantageous exchange rate changes can also cause a change in the position of the Kapsch TrafficCom Group relative to competitors, such as when products or services based on a euro cost structure can no longer be offered at competitive prices outside the eurozone.

**Interest rate risk.** Within the framework of project financing, the group regularly agrees to variable interest rates that are tied to market interest rates (Euribor, etc.). This exposes the group to interest rate risks. The Kapsch TrafficCom Group utilizes appropriate financial instruments to hedge against interest rate risks when these risks are significant.

**Liquidity risk.** Sufficient financial resources have to be available for the Kapsch TrafficCom Group to meet its payment obligations at all times. Medium- and long-term financing must be available in order to carry out large-scale projects, such as implementing a nationwide toll system under agreed delayed payment terms from the client, and to acquire other companies. Additionally, implementing large-scale projects often requires the provision of significant bank guarantees to secure bid obligations (bid bonds) or to secure possible warranty claims (performance bonds).

In financing agreements, the Kapsch TrafficCom Group is subject to the usual limitations of its business policy, such as with regard to taking on additional borrowings, the use of assets as collateral or the provision of guarantees and sureties in favor of third parties. The availability of financing and bank guarantees depends not only on market conditions but in particular on the net assets, financial position and earnings situation of the Kapsch TrafficCom Group. A lack of liquid assets (even if the group is otherwise essentially solvent), of

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financing or of bank guarantees could in turn have an extremely adverse impact on the net assets, financial position and earnings situation of the Kapsch TrafficCom Group.

Furthermore, the liquidity risk is addressed by ongoing group-wide financial and cash planning. Potential liquidity shortages can be identified this way and adequate countermeasures can be taken in good time.

**Credit risk.** The Kapsch TrafficCom Group is exposed to the risk of non-payment by customers. The main customers of the Kapsch TrafficCom Group are to a large extent state agencies, especially in connection with the installation or operation of nationwide or regional toll and traffic management systems. The Kapsch TrafficCom Group also acts as a subcontractor to third parties (concessionaires, general contractors, etc.) in public sector projects. The scope of a potential non-payment varies depending on the size of the order and can have a noticeable impact on the earnings situation in the case of individual large projects. In principle, however, the customers for such large projects are public agencies. The creditworthiness of new and existing customers is evaluated as necessary, and hedging is performed according to the assessment of the existing non-payment risk. In addition, the Kapsch TrafficCom Group takes advantage of offers from public institutions, such as OeKB (Oesterreichische Kontrollbank AG), EKN (Exportkreditnämnden; Swedish National Export Credits Guarantee Board) and MIGA (Multilateral Investment Guarantee Agency), to hedge against the non-payment risk on the basis of guarantees.

There is also a risk that counterparties of both original and derivative financial instruments (including financial institutions assumed to have good credit ratings) cannot meet their payment liabilities when due. A payment default or the need to impair receivables could have an extremely adverse impact on the net assets, financial position and earnings situation of the Kapsch TrafficCom Group.

#### **Personnel risk**

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Kapsch TrafficCom employs attractive measures to counteract the personnel risk.

The success of the Kapsch TrafficCom Group depends heavily on key personnel with many years of experience. Moreover, the group's ability to recruit qualified staff, integrate them into the company and retain them over the long term is critical. The loss of key personnel and difficulties in the recruitment of personnel could adversely affect the success of the group.

The Kapsch TrafficCom Group employs attractive measures to counteract this risk, such as incentive schemes and opportunities for training and further education.

#### **Legal risks**

In connection with participating in tenders of public agencies for the installation and operation of toll and traffic management systems, a number of regulations and statutory requirements must be observed. Assessing and adhering to legal regulations and requirements can result in considerable administrative and technical expense. If applicable regulations or official requirements cannot be met or fulfilled, this can lead to severe penalties and also reduce the possibility of (successfully) taking part in tenders or continuing with the given business activity.

The further expansion of business activities into new regions and into select new IMS business fields tends to increase the risk of patent violations or the violation of intellectual property rights (IPR), which could result in financial damages from lawsuits, court actions and settlement proceedings. The Kapsch TrafficCom Group attempts to counteract this risk as far as possible by performing an evaluation of possible IPR violations prior to entry into new markets or regions, for example. However, it is not possible to completely avoid this risk.

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### IT risks

As a technology company, the Kapsch TrafficCom Group is exposed to common IT risks in terms of the security, confidentiality and availability of data. To this end, Kapsch TrafficCom AG has introduced an IT risk management system based on CRISAM, the Corporate Risk and IT Security Application Method, and is also certified according to ISO/IEC 27001 (Information Security Management). Additionally, the toll system operation procedures of the Kapsch TrafficCom Group have been certified according to ISO 20000 "IT Service Management" (similar to ITIL), and CRISAM has been implemented within the group as an IT risk management tool.

### Opportunities

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The early identification of opportunities opens up new potential.

The enterprise risk management approach of Kapsch TrafficCom AG not only addresses risks but also encompasses the regular identification, evaluation and management of opportunities. The goal of these efforts is to manage the strategic orientation of the product portfolio and market activities through the early identification of opportunities and to develop corresponding potential.

**Market opportunities** exist in geographic diversification as well as increasing expansion of the customer and product portfolios, driven in part by the following factors:

Due to the increasing financing requirements of infrastructure projects and the growing need to relieve state budgets, there exists an opportunity to develop new markets, especially in emerging and developing countries, as well as an opportunity to expand our activities into already developed markets.

The global rise in traffic volumes and the associated impact on the environment and society open up opportunities in the area of traffic management because measures such as toll collection, road pricing and the establishment of environmental zones or access restrictions are increasingly being employed as controlling instruments of environmental and traffic policy. In the ETC segment as well as with IMS, this is creating opportunities to further develop and market the portfolio according to the new requirements.

The drive to increase the productivity of vehicles and vehicle operations as well as the rising comfort expectations of travelers also open up new opportunities for expanding the functionality of existing systems. This creates opportunities to win new customers outside of public agencies, such as in the area of fleet management, and to serve both public customers and end customers with new concepts for parking space management.

**Other opportunities.** Constant innovation, technical advancements and the acquisition of new technologies through company acquisitions create opportunities for the Kapsch TrafficCom Group to improve the efficiency and performance of customer systems as well as to gain a technological edge over competitors with regard to the performance and functionality of the offered systems.

### Overall assessment of the risk situation

From the current perspective, no risks have been identified that could endanger the continued operations of the Kapsch TrafficCom Group. Through the increasing geographic diversification and continued broadening of the product and solution portfolio with select new IMS solutions, the business model of the Kapsch TrafficCom Group has been expanded without necessitating a departure from the core business field. The concentration of risk in individual regions and individual large products is continuously reduced in this way.

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### 3.4 Internal control system (ICS) with respect to the accounting process

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The reliability of the internal control system is evaluated by Internal Audit.

Kapsch TrafficCom AG began many years ago to analyze and document the existing accounting-related internal control processes. The results to date were presented to the Supervisory Board for evaluation and discussion in the quarterly meetings of the Audit Committee. Internal Audit ensures through audits, especially in the subsidiaries of Kapsch TrafficCom AG, that a reliable and functional control system is implemented.

As in the previous year, the group-wide uniform documentation of all controls for achieving the key controlling goals was improved again in the 2015/16 fiscal year, and the levels of compliance and efficiency were checked in local evaluations by Internal Audit. The standardized tracking enables improved controlling of measures and serves as the basis for future audits of the performance of local internal control systems.

The processes for group accounting and reporting are based on an accounting manual (IFRS Accounting Manual) that is issued and regularly updated by the Kapsch Group. This manual sets forth the main accounting and reporting requirements for the entire group based on the International Financial Reporting Standards (IFRS). Group guidelines, working instructions and defined procedures constitute another important cornerstone of ICS.

The central elements of the ICS process include regular checks of the established principle of dual control and the segregation of duties as well as defined actions for monitoring the effectiveness and efficiency of operating activities, the reliability of financial reporting and compliance with relevant legal regulations. The ICS guidelines of Kapsch TrafficCom AG follow the basic structures of the internationally recognized standards for internal control systems (COSO – Internal Control and Enterprise Risk Management Integrated Frameworks of the Committee of Sponsoring Organizations of the Treadway Commission).

The accounting of business transactions in the Kapsch TrafficCom Group is managed by a variety of software solutions. In a number of countries, the accounting has been outsourced to local tax accountants due to the size of the subsidiaries. The individual companies submit reporting packages to the head office on a monthly basis containing all relevant accounting data pertaining to the income statement, the balance sheet and the cash flow accounting. This data is then entered into the central consolidation system (Hyperion Financial Management) on a quarterly basis. The financial information is verified at the group level within Kapsch TrafficCom AG and forms the basis for the quarterly reporting in accordance with IFRS.

The Supervisory Board is kept informed of business developments by the Executive Board during regular meetings by way of consolidated presentations consisting of segment reporting, earnings development analysis containing comparisons of current figures with figures from the budget and the previous period as well as selected financial figures, forecasts, group financial statements and changes in the number of employees and order intake.

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The internal control system is implemented locally in each company and monitored centrally.

Local management is responsible for implementing and monitoring the internal control system in accordance with the local requirements. The managing directors of the individual subsidiaries are ultimately responsible for establishing and designing internal control and risk management processes that meet the needs of the given company in view of accounting procedures as well as for ensuring compliance with the group-wide rules and guidelines. In order to provide better support to the management teams of the subsidiaries, an ICS officer was established within the Finance department of Kapsch TrafficCom AG. This person is responsible for centrally standardizing the ICS within the entire Kapsch TrafficCom Group, ensuring continuous further development, initiating the improvement of identified weaknesses and periodically reporting to the Audit Committee of the Supervisory Board.

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### 3.5 Disclosures according to Section 267 Commercial Code in connection with Section 243a para. 1 Commercial Code

1. The fully paid-in share capital of Kapsch TrafficCom AG amounts to EUR 13.0 million. It is divided into 13.0 million no par value bearer shares.
2. No restrictions exist with regard to the exercising of voting rights or the transfer of shares.
3. On 31 March 2016, roughly 36.7 % of the shares in Kapsch TrafficCom AG were in free float. KAPSCH-Group Beteiligungs GmbH held roughly 63.3 % of the shares as of 31 March 2016. KAPSCH-Group Beteiligungs GmbH is a one hundred percent subsidiary of DATAX HandelsgmbH, the shares of which are held in equal proportions by the Traditio-Privatstiftung, the ALUK-Privatstiftung and the Children of Elisabeth-Privatstiftung, each a private trust under the Austrian Law for Private Trusts. These are each attributable to members of the Kapsch family. On 31 March 2016, there were no other shareholders who held more than 10 % of the voting rights in Kapsch TrafficCom AG.
4. No shares with special control rights exist.
5. No restrictions exist with respect to the exercising of the voting right by employees with capital participation.
6. There are no special provisions regarding the appointment and recall of the members of the executive board and the supervisory board or modification of the articles of association.
7. Neither authorized capital nor conditional capital currently exists at the company, which empowers the Executive Board to issue shares with the approval of the Supervisory Board and without (renewed) consideration by the annual general meeting.
8. No agreements exist that enter into effect in the event of a public takeover offer.
9. No compensation agreements exist between Kapsch TrafficCom AG and its Executive Board and Supervisory Board Members or employees for the event of a public takeover offer.

## 4 Material Events after the Balance Sheet Date.

- On 1 April 2016, Kapsch TrafficCom AG acquired the global transportation segment of Schneider Electric, which previously operated under the name Telvent Tráfico y Transporte. The purchase one of the leading provider of real-time IT solutions and intelligent transportation systems for roughly EUR 27 million expands the Kapsch portfolio and strengthens the market position in intelligent mobility systems.

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Kapsch TrafficCom took another significant step into the area of IMS after the balance sheet date.

This acquisition represents an important step toward securing the global leadership of the Kapsch TrafficCom Group in the area of intelligent mobility solutions (IMS), especially in the growing markets of Spain, North and South America and the Middle East.

Kapsch TrafficCom expects revenue of roughly EUR 125 million from the transportation segment as well as a positive contribution to the overall results. The new company should be fully integrated in the 2016/17 fiscal year. As a result of this acquisition, roughly 900 employees of Schneider Electric are being integrated into the Kapsch TrafficCom Group.

- On 21 April 2016, the US company Kapsch TrafficCom Holding Corp. purchased a minority share in ParkJockey Global, Inc., U.S.A., for roughly EUR 2.4 million.
- Under the condition precedent of a still pending contractually defined consent, Kapsch Telematic Services GmbH, Austria, acquires 48 % in Kapsch Telematic Services spol. s r.o., thus holding 100 % shares in the company that operates the toll system in the Czech Republic.
- With a view to refinance the corporate bond and to finance future growth, Kapsch TrafficCom AG prepares a promissory note bond (*Schuldscheindarlehen*) addressing institutional investors in the public market. It was distributed on 1 June 2016. This transaction is planned to be completed in the course of the first quarter of the fiscal year 2016/17.

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## 5 Outlook and Targets.

The further development of Strategy 2020 remains a focal topic: Kapsch TrafficCom will develop intelligent mobility solutions and contribute to the design of the smart cities of the future.

In fiscal year 2016/17, the contribution by Kapsch TrafficCom Transportation to the revenue and profit of the Kapsch TrafficCom Group will be clearly visible – also the integration costs. The implementation of the newly obtained projects will also make increasing contributions. This applies in particular to the cross-border program “CHARM” and the ETC projects in Chile and Australia.

Kapsch TrafficCom also expects several decisions concerning additional projects: In Austria, the new invitation to tender for the nationwide toll system is currently under way; in Bulgaria, an invitation to tender for a new toll system has begun. In the Czech Republic, the contract continues until the end of 2016. The next steps by the government in Prague will therefore be determined shortly.

In addition, multiple projects are still in the offer phase in the U.S.A. Kapsch TrafficCom also sees increasing potential in Asia. Talks continue concerning a nationwide project similar in structure to the one already successfully implemented in Belarus.

One key focal area for the coming years will be the further development of the strategy 2020. Kapsch TrafficCom will expand the portfolio with new intelligent mobility solutions for exceptional user experiences by the customers. Systems and data will be increasingly intermeshed, and vehicles will be networked with their environment. The acquisition of the transportation segment of Schneider Electric also represents a large step toward the city. Kapsch TrafficCom plans to carefully integrate this area in order to contribute to the design of the smart cities of the future.

Vienna, 8 June, 2016



Georg Kapsch  
Chief Executive Officer



André Laux  
Executive board member



Alexander Lewald  
Executive board member



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# Statement

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## Of all Members of the Executive Board.

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### Statement of all Members of the Executive Board pursuant to Section 82 Para. 4 No. 3 BörseG (Austrian Stock Exchange Act)

We declare to the best of our knowledge that the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and profit or loss of the group as required by the applicable accounting standards and that the group management report gives a true and fair view of the development and performance of the business and the position of the group, together with a description of the principal risks and uncertainties faced by the group.

Vienna, 8 June, 2016



Georg Kapsch  
Chief Executive Officer



André Laux  
Executive board member



Alexander Lewald  
Executive board member

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## **Additional information**

### **pursuant to Section 82 Para. 4 No. 3 BörseG. (Austrian Stock Exchange Act)**

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<b>Board member</b>	<b>Area of responsibility</b>
Georg Kapsch Chairman/ Chief Executive Officer	Finance, mergers & acquisitions, investor relations, compliance, strategy, legal, international subsidiaries & management systems, IT, human resources, marketing & public relations, baseline solution management, new ventures and sales region North America
André Laux Member/ Chief Operating Officer	All sales regions except for North America, production & logistics, supply chain management and delivery & operations
Alexander Lewald Member/ Chief Technology Officer	Engineering

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# Consolidated Financial Statements

## As of 31 March 2016.

### Consolidated statement of comprehensive income.

All amounts in EUR	Note	2015/16	2014/15
<b>Revenues</b>	(1)	<b>526,091,567</b>	<b>456,377,377</b>
Other operating income	(2)	17,028,271	21,220,911
Changes in finished and unfinished goods and work in progress	(3)	-12,290,757	-5,276,194
Other own work capitalized		708,875	104,353
Cost of materials and other production services	(4)	-201,861,358	-168,034,419
Staff costs	(5)	-153,160,789	-148,102,477
Amortization and depreciation	(6)	-14,532,982	-16,434,371
Impairment charge	(6)	0	-12,342,000
Other operating expenses	(7)	-99,636,031	-94,763,384
<b>Operating result</b>		<b>62,346,797</b>	<b>32,749,796</b>
Finance income	(8)	12,901,839	13,255,371
Finance costs	(8)	-20,473,837	-26,306,798
<b>Financial result</b>		<b>-7,571,998</b>	<b>-13,051,426</b>
Results from associates	(14)	40,617	233,819
<b>Result before income taxes</b>		<b>54,815,416</b>	<b>19,932,188</b>
Income taxes	(9)	-18,355,734	-8,524,107
<b>Result for the period</b>		<b>36,459,682</b>	<b>11,408,081</b>
<b>Result attributable to:</b>			
Equity holders of the company		31,091,775	3,629,908
Non-controlling interests		5,367,907	7,778,173
		<b>36,459,682</b>	<b>11,408,081</b>
<b>Earnings per share from the result for the period attributable to the equity holders of the company (in EUR)</b>			
diluted	(32)	2.39	0.28
undiluted	(32)	2.39	0.28
<b>Other comprehensive income for the period:</b>			
<b>Items subsequently reclassified to the result for the period:</b>			
Currency translation differences		2,504,663	-12,558,566
Currency translation differences from net investments in foreign operations		-2,334,164	9,045,070
Available-for-sale financial assets:			
Fair value gains/losses recognized in other comprehensive income		-4,606,733	2,030,730
Reclassification of cumulated net losses to the result for the period (impairment)		1,237,309	12,185,425
Reclassification of cumulated net gains to the result for the period (sale of available-for-sale financial assets)		-3,317,930	0
Income tax relating to items subsequently reclassified to the result for the period		1,422,895	-2,389,978
<b>Total items subsequently reclassified to the result for the period</b>		<b>-5,093,960</b>	<b>8,312,681</b>
<b>Items subsequently not reclassified to the result for the period:</b>			
Remeasurements of liabilities from post-employment benefits		-231,196	-3,164,172
Income tax relating to items subsequently reclassified to the result for the period		92,528	645,608
<b>Total items subsequently not reclassified to the result for the period</b>		<b>-138,668</b>	<b>-2,518,564</b>
<b>Other comprehensive income for the period net of tax</b>	(10)	<b>-5,232,628</b>	<b>5,794,117</b>
Total comprehensive income for the period		<b>31,227,054</b>	<b>17,202,198</b>
<b>Total comprehensive income attributable to:</b>			
Equity holders of the company		23,744,417	9,226,306
Non-controlling interests		7,482,637	7,975,892
		<b>31,227,054</b>	<b>17,202,198</b>

## Consolidated balance sheet.

All amounts in EUR	Note	31 March 2016	31 March 2015
<b>ASSETS</b>			
<b>Non-current assets</b>			
Property, plant and equipment	(12)	20,866,937	22,393,204
Intangible assets	(13)	64,911,212	71,250,401
Interests in associates	(14)	1,917,126	2,013,952
Other non-current financial assets and investments	(15)	18,651,333	23,099,327
Other non-current assets	(16)	18,877,084	28,137,787
Deferred tax assets	(22)	11,895,081	13,590,224
		<b>137,118,772</b>	<b>160,484,896</b>
<b>Current assets</b>			
Inventories	(17)	35,757,354	47,669,688
Current tax receivables	(18)	3,754,362	3,336,345
Trade receivables and other current assets	(18)	196,158,016	202,050,857
Other current financial assets	(15)	96,813	5,290,815
Cash and cash equivalents	(19)	140,782,047	96,764,803
		<b>376,548,591</b>	<b>355,112,509</b>
<b>Total assets</b>		<b>513,667,364</b>	<b>515,597,404</b>
<b>EQUITY</b>			
<b>Capital and reserves attributable to equity holders of the company</b>			
Share capital	(20)	13,000,000	13,000,000
Capital reserve		117,508,771	117,508,771
Retained earnings and other reserves		92,338,014	77,449,325
		<b>222,846,785</b>	<b>207,958,096</b>
<b>Non-controlling interests</b>		<b>7,811,064</b>	<b>11,403,134</b>
<b>Total equity</b>		<b>230,657,849</b>	<b>219,361,230</b>
<b>LIABILITIES</b>			
<b>Non-current liabilities</b>			
Non-current financial liabilities	(21)	85,733,509	88,984,654
Liabilities from post-employment benefits to employees	(23)	24,107,382	25,210,018
Non-current provisions	(26)	1,395,787	1,661,173
Other non-current liabilities	(24)	3,332,528	4,656,718
Deferred income tax liabilities	(22)	3,190,360	2,379,882
		<b>117,759,566</b>	<b>122,892,444</b>
<b>Current liabilities</b>			
Trade payables		52,040,998	48,441,473
Other liabilities and deferred income	(25)	79,341,558	65,535,073
Current tax payables		3,572,533	1,173,523
Current financial liabilities	(21)	21,349,269	48,968,988
Current provisions	(26)	8,945,590	9,224,672
		<b>165,249,949</b>	<b>173,343,730</b>
<b>Total liabilities</b>		<b>283,009,514</b>	<b>296,236,174</b>
<b>Total equity and liabilities</b>		<b>513,667,364</b>	<b>515,597,404</b>

## Consolidated statement of changes in equity.

All amounts in EUR	Attributable to equity holders of the company				Non-	Total equity
	Share capital	Capital reserve	Other reserves	Consolidated retained earnings	controlling interests	
<b>Carrying amount as of 31 March 2014</b>	<b>13,000,000</b>	<b>117,508,771</b>	<b>-13,712,693</b>	<b>86,003,813</b>	<b>10,310,208</b>	<b>213,110,099</b>
Effects from increase in shares of subsidiaries			-4,068,101		41,799	-4,026,302
Effects from initial consolidation of subsidiaries					4,900	4,900
Dividend					-6,929,665	-6,929,665
Result for the period				3,629,908	7,778,173	11,408,081
Other comprehensive income for the period:						
Currency translation differences			-5,972,483		197,719	-5,774,764
Fair value gains/losses on available-for-sale financial assets			14,087,445			14,087,445
Remeasurements of liabilities from post-employment benefits			-2,518,564			-2,518,564
<b>Carrying amount as of 31 March 2015</b>	<b>13,000,000</b>	<b>117,508,771</b>	<b>-12,184,396</b>	<b>89,633,721</b>	<b>11,403,134</b>	<b>219,361,230</b>
Effects from acquisition of subsidiaries			0		21,006	21,006
Effects from increase in shares of subsidiaries			-2,404,359		-4,338,526	-6,742,885
Effects from decrease in shares of subsidiaries			48,632		-48,632	0
Dividend				-6,500,000	-6,708,555	-13,208,555
Result for the period				31,091,775	5,367,907	36,459,682
Other comprehensive income for the period:						
Currency translation differences			-1,360,690		2,114,730	754,040
Fair value gains/losses on available-for-sale financial assets			-5,848,000		0	-5,848,000
Remeasurements of liabilities from post-employment benefits			-138,668			-138,668
<b>Carrying amount as of 31 March 2016</b>	<b>13,000,000</b>	<b>117,508,771</b>	<b>-21,887,481</b>	<b>114,225,495</b>	<b>7,811,064</b>	<b>230,657,849</b>

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**Share capital.** The total number of shares issued is 13,000,000. The shares are ordinary bearer shares and have no par value.

**Capital reserve.** Capital reserve includes those reserves that have not been established from results of prior periods.

**Other reserves.** Other reserves contain effects of changes in the investment interest held in subsidiaries as well as reserves from other comprehensive income, for example currency translation differences and fair value gains/losses on available-for-sale financial assets after deduction of deferred taxes and remeasurements of liabilities from post-employment benefits after deduction of deferred taxes.

**Consolidated retained earnings.** Retained earnings include the net result for the fiscal year as well as past earnings of the entities included in consolidation, to the extent that these results have not been distributed as dividends.

**Non-controlling interests.** Non-controlling interests represent the third party shares in the equity of consolidated subsidiaries.

The effects from acquisition of subsidiaries in the fiscal year 2015/16 result from the acquisition of shares in Streetline International, Inc., Delaware, U.S.A.

The effects from the increase in shares of subsidiaries in the fiscal year 2015/16 result from the acquisition of the remaining shares in TMT Services and Supplies (Pty) Ltd., Cape Town, South Africa. The effects from the increase in shares in the fiscal year 2014/15 result from the acquisition of the 3% remaining shares in Kapsch Telematic Services GmbH, Vienna.

## Consolidated cash flow statement.

All amounts in EUR	Note	2015/16	2014/15
<b>Cash flow from operating activities</b>			
Operating result		62,346,797	32,749,796
Adjustments for non-cash items and other reconciliations:			
Scheduled depreciation and amortization	(6)	14,532,982	16,434,371
Impairment charge	(6)	0	12,342,000
Increase/decrease in obligations for post-employment benefits	(23)	-1,776,532	-245,363
Increase/decrease in other non-current liabilities and provisions	(24, 26)	-1,250,875	-31,271
Increase/decrease in other non-current receivables and assets	(15)	-9,700,466	3,646,195
Increase/decrease in trade receivables (non-current)	(16)	22,463,531	46,367,768
Increase/decrease in trade payables (non-current)	(24)	-602,836	-891,853
Other (net)		-328,646	-1,798,344
		<b>85,683,957</b>	<b>108,573,298</b>
Changes in net current assets:			
Increase/decrease in trade receivables and other assets	(18)	6,472,721	6,031,721
Increase/decrease in inventories	(17)	11,912,334	10,438,069
Increase/decrease in trade payables and other current payables		12,884,830	-15,462,030
Increase/decrease in current provisions	(26)	-279,082	-19,153,077
		<b>30,990,803</b>	<b>-18,145,317</b>
<b>Cash flow from operations</b>		<b>116,674,760</b>	<b>90,427,981</b>
Interest received	(8)	2,679,338	1,773,062
Interest payments	(8)	-5,226,812	-5,982,746
Net payments of income taxes		-16,225,090	-11,006,156
<b>Net cash flow from operating activities</b>		<b>97,902,196</b>	<b>75,212,141</b>
<b>Cash flow from investing activities</b>			
Purchase of property, plant and equipment	(12)	-7,049,013	-7,374,407
Purchase of intangible assets	(13)	-2,944,424	-993,841
Purchase of securities, investments and other non-current financial assets	(15)	-100,293	-361,651
Payments for the acquisition of entities (less cash and cash equivalents of these entities)		2,542,784	0
Payments for the acquisition of shares in at-equity-consolidated entities		-69	0
Proceeds from the disposal of property, plant and equipment and intangible assets		2,771,393	1,353,079
Proceeds from the disposal of securities and other financial assets		5,374,761	0
<b>Net cash flow from investing activities</b>		<b>595,139</b>	<b>-7,376,820</b>
<b>Cash flow from financing activities</b>			
Contributions from shareholders		0	4,900
Dividends paid to parent company's shareholders		-6,500,000	0
Dividends paid to non-controlling interests		-6,708,555	-6,929,665
Payments for the acquisition of non-controlling interests		-6,742,885	-2,000,000
Increase in non-current financial liabilities	(21)	470,947	183,719
Decrease in non-current financial liabilities	(21)	0	0
Increase in current financial liabilities	(21)	2,829,828	7,053,189
Decrease in current financial liabilities	(21)	-32,926,939	-30,219,823
<b>Net cash flow from financing activities</b>		<b>-49,577,604</b>	<b>-31,907,680</b>
<b>Net increase/decrease in cash and cash equivalents</b>		<b>48,919,731</b>	<b>35,927,641</b>
<b>Change in cash and cash equivalents</b>			
Cash and cash equivalents at beginning of year	(19)	96,764,803	57,731,290
Net increase/decrease in cash and cash equivalents		48,919,731	35,927,641
Exchange gains/losses on cash and cash equivalents		-4,902,488	3,105,873
<b>Cash and cash equivalents at end of year</b>	(19)	<b>140,782,047</b>	<b>96,764,803</b>

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# Notes to the Consolidated Financial Statements.

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## General information.

The Kapsch TrafficCom Group is an international supplier of sophisticated Intelligent Transportation Systems (ITS). Up until 31 December 2015, it reported on the primary segments RSP (Road Solution Projects), SEC (Systems, Extensions and Component Sales) and OTH (Others). The RSP segment included the cash-generating units "RSP-ETC" and "RSP-ITS". The SEC segment showed the cash-generating units "SEC-ETC" and "SEC-ITS".

In the course of a strategy project, the Kapsch TrafficCom Group decided to change the structure and the related corporate control in the fiscal year 2015/16. As a result of this project, Electronic Toll Collection (ETC) and Intelligent Mobility Solutions (IMS) have been the Group's divisions as of the fourth quarter of the fiscal year 2015/16. The Group is now also divided into and managed by three regional clusters (management reporting), with the clusters being Americas (comprising North and South America), EMEA (comprising Europe, the Middle East and Africa) as well as APAC (comprising Asia and the Pacific).

In accordance with the provisions of IFRS 8.12, the Group aggregated the regions into two segments. Since the identified segments each show amounts (revenues, results and assets) in excess of the thresholds defined under IFRS 8.13, these segments also represent the reportable segments pursuant to IFRS 8.

The reportable segments according to IFRS 8 are as follows:

- ▶ Electronic Toll Collection (ETC)
- ▶ Intelligent Mobility Solutions (IMS)

The segment **Electronic Toll Collection (ETC)** reflects projects for the installation, maintenance and operation of systems for electronic collection of tolls without stopping at a toll station as well as manual toll systems. These are generally projects awarded based on invitations to tender by public agencies or private concessionaires. The systems cover either individual road sections or nationwide road networks. After installation, additional deliveries of components frequently take place for the expansion or adaptation of the systems.

The segment **Intelligent Mobility Solutions (IMS)** reflects projects for the installation, maintenance and operation of systems for traffic monitoring, traffic control and traffic safety. Projects for the monitoring of utility vehicles and for electronic vehicle registration as well as intelligent parking solutions and systems for intermodal mobility are also assigned to this segment as are systems and services for operational monitoring of public transportation and environmental installations.

## Group structure.

The parent company (reporting entity) of this group is Kapsch TrafficCom AG, Vienna. Until June 2007 KAPSCH-Group Beteiligungs GmbH, Vienna, (immediate parent company of the reporting entity), a wholly-owned subsidiary of DATAX HandelsgmbH, had been the sole shareholder of Kapsch TrafficCom AG. DATAX HandelsgmbH, Vienna, is the controlling entity of the reporting entity and the ultimate parent of Kapsch Group.

As of 31 March 2016 KAPSCH-Group Beteiligungs GmbH has a share of 63.28 % (31 March 2015: 63.13 %) in Kapsch TrafficCom AG, Vienna. The shares of Kapsch TrafficCom AG in free float are listed in the Prime Market segment of the Vienna Stock Exchange since 26 June 2007.



## Consolidated group.

The parent company, Kapsch TrafficCom AG, is a joint stock corporation incorporated and domiciled in Vienna, Austria. The address of its registered office is 1120 Vienna, Am Europlatz 2.

As of 31 March 2016 the consolidated group consists of 48 entities (31 March 2015: 47 entities). The consolidated group changed as follows:

	2015/16	2014/15
Amount of entities at the beginning of the fiscal year	47	48
Initial consolidation	3	3
Mergers	-1	-3
Deconsolidations	-1	-1
<b>Amount of entities in the consolidated group</b>	<b>48</b>	<b>47</b>

In the fiscal year 2015/16 Streetline Inc., Delaware, U.S.A., Streetline International, Inc., Delaware, U.S.A. as well as SPS Funding Co. LLC, Delaware, U.S.A., were acquired. Afterwards Streetline Inc. was merged into KTCSL Merger Corp. and since then trades under the name Streetline Inc.

In the fiscal year 2015/16 Kapsch Telematic Services Kft. "v.a.", Budapest, Hungary, was liquidated and therefore deconsolidated.

The regional distribution of our subsidiaries is as follows:

	2015/16	2014/15
Austria	6	6
EMEA (Europe excl. Austria, Middle East, Africa)	25	26
Americas	13	11
APAC (Asia and Pacific)	4	4
<b>Total</b>	<b>48</b>	<b>47</b>

For further information on interests in subsidiaries see note 29.

## Accounting policies.

The accounting policies applied in the preparation of these consolidated financial statements are set out below:

### 1 Basis of preparation.

Pursuant to Section 245a Austrian Commercial Code (UGB), the consolidated financial statements as of 31 March 2016 have been prepared in accordance with International Financial Reporting Standards (IFRS) as well as the International Financial Reporting Standards Interpretations Committee (IFRS IC) as adopted by the European Union (EU). The consolidated financial statements as of 31 March 2016 are prepared under the historical cost convention, with the exception of available-for-sale securities and derivative financial instruments, which are measured at fair value at the balance sheet date. Pertinent explanations can be found within the scope of the corresponding accounting policies.

The preparation of the consolidated financial statements in conformity with IFRS requires the use of estimates

and assumptions which influence the amount and presentation of assets and liabilities reported at the balance sheet date as well as income and expenses recorded during the reporting period. Although these estimates are made by the management board to the best of their knowledge and are based on current transactions, actual figures may differ from these estimates. The areas involving a higher degree of judgment or complexity as well as areas where assumptions and estimates are material to the consolidated financial statements are disclosed in note 26.

For ease of presentation, amounts have been rounded and, unless indicated otherwise, are presented in thousands of euros (TEUR). However, calculations are done using exact amounts, including the digits not shown, which may lead to rounding differences.

### 1.1 New and amended standards and interpretations that have been adopted by the EU and applied for the first time in the fiscal year 2015/16

New/adopted IFRSs		Published by the IASB (adopted by the EU)	Applicable to financial years beginning on or after	Material impact on group's consolidated financial statement
IAS 19	Employee Benefits (Amendment)	November 2013	1 July 2014	None
<b>Annual improvement to IFRSs, 2010–2012</b>				
IFRS 2	Share-based Payment	December 2013	1 July 2014	None
IFRS 3	Business Combinations	December 2013	1 July 2014	None
IFRS 8	Operating Segments	December 2013	1 July 2014	None
IFRS 13	Fair Value Measurement	December 2013	1 July 2014	None
IAS 16	Property, Plant and Equipment	December 2013	1 July 2014	None
IAS 24	Related Party Disclosures	December 2013	1 July 2014	None
IAS 38	Intangible Assets	December 2013	1 July 2014	None
<b>Annual improvement to IFRSs, 2011–2013</b>				
IFRS 1	First-time Adoption to International Financial Reporting Standards	December 2013	1 July 2014	None
IFRS 3	Business Combinations	December 2013	1 July 2014	None
IFRS 13	Fair Value Measurement	December 2013	1 July 2014	None
IAS 40	Investment Property	December 2013	1 July 2014	None

### 1.2 Standards, interpretations and amendments to published standards that are not yet effective and that have not been prematurely adopted by the group

New/adopted IFRSs		Published by the IASB (adopted by the EU)	Applicable to financial years beginning on or after	Material impact on group's consolidated financial statement
IFRS 14	Regulatory Deferral Accounts	January 2014	1 January 2016	None
IFRS 11	Joint Arrangements (Amendment)	May 2014	1 January 2016	None
IAS 16	Amendments to Property, Plant and Equipment			
IAS 38	and Intangible Assets	May 2014	1 January 2016	None
IAS 16	Amendments to Property, Plant and Equipment			
IAS 41	and Agriculture	June 2014	1 January 2016	None
IAS 27	Separate Financial Statements (Amendment)	August 2014	1 January 2016	None
IAS 1	Presentation of Financial Statements (Amendment)	December 2014	1 January 2016	None
<b>Annual improvement to IFRSs, Cycle 2012–2014</b>				
IFRS 5	Non-current Assets Held for Sale and Discontinued Operations	September 2014	1 July 2016	None
IFRS 7	Financial Instruments	September 2014	1 July 2016	None

New/adopted IFRSs		Published by the IASB (adopted by the EU)	Applicable to financial years beginning on or after	Material impact on group's consolidated financial statement
IAS 19	Employee Benefits	September 2014	1 July 2016	None
IAS 34	Interim Financial Reporting	September 2014	1 July 2016	None
IAS 12	Income Taxes (Amendments)	January 2016	1 January 2017	impact will be assessed
IAS 7	Statement of Cash Flows (Amendments)	January 2016	1 January 2017	impact will be assessed
IFRS 15	Revenue from Contract with Customers	May 2014	1 January 2018	impact will be assessed
IFRS 9	Financial Instruments	July 2014	1 January 2018	impact will be assessed
IFRS 16	Leases	January 2016	1 January 2019	impact will be assessed

There are no other standards or interpretations that are not yet effective that would be expected to have a material impact on the group.

The consolidated financial statements were prepared by the management board on the undersigned date and released for publication. The entity financial statements of the parent company, which have been included in the consolidated financial statements after transition to the applicable accounting standards, have not yet been approved by the supervisory board on the undersigned date.

## 2 Consolidation.

### 2.1 Subsidiaries

Subsidiaries are all companies (including structured companies) where the group exerts its control. The group controls an associated company if the group is exposed to fluctuating returns arising from its interest in the subsidiary, is in possession of entitlements to these returns and has the ability to influence such returns by virtue of its position of power with respect to the associated company. Subsidiaries are included within the consolidated financial statements (full consolidation) as from the time when the parent company has acquired control over the subsidiary. They are deconsolidated at the time when such control is relinquished.

All group internal assets and liabilities, equity, expenses and income as well as unrealized gains and losses from transactions between group companies are completely eliminated in the course of group consolidation.

### 2.2 Transactions with non-controlling interests

Transactions with non-controlling interests are treated as transactions with equity owners of the group. Depending on the ownership structure, the group splits the gains or losses as well as all components of the comprehensive income to the interests of the parent company and the non-controlling interests. Even in the event of a negative balance of the non-controlling interests, the total comprehensive income is attributed to the parent company and the non-controlling interests. For purchases of non-controlling interests, the difference between any consideration paid and the relevant interest acquired of the carrying value of net assets of the subsidiary is recorded in equity. Gains or losses on disposals to non-controlling interests are also recorded in equity, unless a change in the percentage of shares held leads to a loss of control of the interest.

If a change in the percentage of shares held does not lead to the loss of control of the interest, the transactions are to be shown under equity. The carrying amounts for both the controlling and non-controlling interests are correspondingly set so as to ensure they reflect any changes to the existing shareholdings. Every deviation between the amount by which the non-controlling interests are adjusted and the fair value of the paid or received consideration is to be directly recognized under equity and allocated to the owners of the parent company.

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If the group loses its control over any of the companies, the assets and liabilities of the former subsidiary are to be removed from the consolidated balance sheet. The remaining interest is to be remeasured at fair value and regarded as the initially recognized value of a financial asset pursuant to IAS 39 "Financial Instruments: recognition and measurement" or as acquisition costs in case of the addition of an interest in an associated company or joint venture. Any resulting gains or losses which are attributable to the controlling interest are recognized in the income statement. In addition, any amounts previously recognized in other comprehensive income with respect to the previous subsidiary are accounted for as if the group had directly disposed of the related assets or liabilities. This means that amounts previously recognized in other comprehensive income are reclassified from equity to the result for the period.

### **2.3 Joint arrangements**

The group applies IFRS 11 to all joint arrangements. As at balance sheet date of 31 March 2016 there are no joint arrangements according to IFRS 11.

### **2.4 Associates**

Associates are entities in which the group has a significant but not a controlling influence, generally accompanied by a shareholding of between 20% and 50% of the voting rights. Associates are reported using the equity method and initially recognized at acquisition costs. Following the acquisition date, the share of the company in the result of the associate is recorded in the statement of comprehensive income and the share of changes in other comprehensive income is recognized in other comprehensive income with a corresponding adjustment being made to the carrying amount of the interest. Dividends received from the affiliated company reduce the carrying amount of the interest. Goodwill arising on acquisition of associates is not separately shown but as part of the carrying amount of associates.

If the percentage of shares held in an associate is reduced but significant influence is retained, only a proportionate share of the amounts previously recognized in other comprehensive income is reclassified to the profit or loss for the period where appropriate.

The accumulated shares of the group in the gains and losses as well as the other comprehensive income of the associate following acquisition are offset against the carrying amount of the interest. When the group's share of losses in an associate equals or exceeds its interest in the associate, including any other unsecured receivables, the group does not recognize further losses unless it has incurred obligations or made payments on behalf of the associate.

At each balance sheet date the group checks whether there are any indications showing that the investment in an associate is impaired. If this is the case, the impairment requirement is determined as the difference arising from the carrying amount of the interest of the associate and the corresponding recoverable amount and recognized separately in the statement of comprehensive income. Significant unrealized gains from transactions between the group and associates are eliminated to the extent of the group's interest in the associates. Unrealized losses are also eliminated unless the transaction provides evidence of an impairment of the asset transferred.

The accounting policies of associates correspond substantially to those of the parent company.

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### 3 Business combinations.

The group uses the acquisition method of accounting to account for business combinations as at the acquisition date. The acquisition date relates to the date of transfer of control to the group.

The consideration transferred for the acquisition is the fair value of the assets transferred, the equity interests issued by the group and the liabilities incurred or assumed as at the transaction date. The consideration transferred includes the fair value of any asset or liability resulting from a contingent consideration arrangement. Acquisition-related costs are expensed in full as incurred.

In accordance with IFRS 3, any assets acquired and liabilities (including contingent liabilities) assumed in a business combination are measured at their full fair values as at the acquisition date, irrespective of the extent of any non-controlling interests. Intangible assets are recognized separately from goodwill if they are separable from the entity or result from statutory, contractual or other legal rights. No new restructuring provisions may be recognized within the scope of the purchase price allocation. Any remaining positive differences, which compensate the seller with market opportunities that cannot be identified more closely and with development potential, are capitalized as goodwill in the respective cash generating unit (CGU).

Any contingent consideration to be transferred by the group is recognized at fair value as at the acquisition date. Subsequent changes to the fair value of the contingent consideration that is deemed to be an asset or liability is measured in accordance with IAS 39 and a resulting profit or loss recognized in the statement of comprehensive income. Contingent consideration that is classified as equity is not re-measured, and its subsequent settlement is accounted for within equity. Any contingent consideration included in the financial statements resulting from business combinations prior to the application of IFRS 3 (2008) is still treated in accordance with the requirements under IFRS 3 (2004).

If the combination is achieved in stages, the equity capital share previously held in the acquired company by the acquirer is remeasured at the fair value as at the acquisition date. Any resulting profit or loss is to be charged to be credited or charged to the income statement.

Any hidden reserves and liabilities uncovered are carried forward in line with the corresponding assets and liabilities.

The determination of the fair values requires certain estimates and assumptions, in particular of the acquired intangible assets and property, plant and equipment, of the liabilities assumed as well as of the useful lives of the acquired intangible assets and property, plant and equipment.

The group recognizes any non-controlling interest in the acquiree on an acquisition-by-acquisition basis, either at fair value or at the non-controlling interest's proportionate share of the recognized amounts of the acquiree's net assets.

The group determines the goodwill at the acquisition date as:

- ▶The fair value of the consideration transferred – if necessary plus
- ▶The value recognized of all recognized non-controlling interests in the acquiree – plus
- ▶The fair value of the acquirer's previously held equity interest in the acquiree if the combination is achieved in stages – less
- ▶The net amount (in general of the fair values) of the identifiable assets acquired and liabilities assumed and contingent liabilities.

If the excess is negative, a gain on a bargain purchase is recognized directly in the result for the period.

## 4 Foreign currency translation.

Items included in the financial statements of each of the group's entities are measured using the currency of the primary economic environment in which the entity operates (functional currency). The consolidated financial statements are presented in euros, which is the Kapsch group's presentation currency.

### 4.1 Translation of financial statements in foreign currencies

In accordance with IAS 21, financial statements of foreign subsidiaries which are included in the consolidated financial statements are translated as follows:

The statement of comprehensive income of foreign entities (except for foreign entities from hyperinflationary countries) that have a functional currency different from the euro are translated into the group's presentation currency at average exchange rates of the fiscal year, balance sheets at the prevailing mean exchange rate at the balance sheet date. The reference rates of the European Central Bank (ECB) and Deutsche Bundesbank, which are accessible via the Austrian Central Bank's (*Oesterreichische Nationalbank*) website, serve as the basis for the translation. If no current exchange rates are available, this will result in the exchange rates as disclosed by the national banks being used. Differences arising from the currency translation of foreign operations into euros are recognized under other comprehensive income and collected under equity.

Exchange differences arising from the translation of the net investment subsidiaries are recognized in the statement of other comprehensive income under currency translation differences. When a foreign entity is sold, such exchange differences are recognized in the statement of comprehensive income as part of the gain or loss on disposal of shares in subsidiaries.

Goodwill and adjustments to the fair value in connection with the acquisition of a foreign company are treated as the assets and liabilities of the foreign company in question and converted in the course of initial consolidation at the transaction rate and subsequently converted with the key date exchange rate as at the financial statements key date of the business operation.

The main exchange rates used during the fiscal year are shown below:

Wechselkurse zum Euro	Average exchange rate		Exchange rate as at the balance sheet date	
	2015/16	2014/15	2015/16	2014/15
AUD	1.497	1.452	1.481	1.415
CAD	1.443	1.440	1.474	1.374
CZK	27.164	27.580	27.051	27.533
PLN	4.224	4.181	4.268	4.085
SEK	9.324	9.213	9.225	9.290
USD	1.101	1.265	1.139	1.076
ZAR	15.148	13.950	16.787	13.132

In the fiscal year 2011/12, Kapsch Telematic Services IOOO, Minsk, Republic of Belarus, was founded. As at the balance sheet date of 31 March 2016, the Republic of Belarus is still classified as a hyperinflationary economy. The group analyzed if IAS 29 (Financial reporting in hyperinflationary economies) had to be applied to the subsidiary. Since the euro, and not the Belorussian ruble (BYR), is the functional currency, the classification of the Republic of Belarus as a hyperinflationary economy has no impact on the accounting of the Belorussian subsidiary and thus also does not affect the present consolidated financial statements. IAS 29 is therefore not applied.

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#### 4.2 Foreign currency transactions

Transactions in foreign currencies are translated into the functional currency at the exchange rate as at the transaction date or, in case of new measurements, as at the time of the measurement. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies are recognized in the statement of comprehensive income. Non-monetary items in the balance sheet are translated at historical exchange rates; non-monetary items which were recognized at their lower net realizable value are translated at the exchange rate prevailing at the time of measurement.

Foreign exchange gains and losses which are attributable to cash and cash equivalents as well as borrowings are presented in the statement of comprehensive income within finance income or cost. All other foreign exchange gains and losses are presented in the statement of comprehensive income in other operating income or other operating expenses.

This excludes foreign exchange gains and losses from monetary items to be received from/to be paid to foreign operations as part of a net investment in a foreign operation. Such foreign exchange gains and losses are initially recognized in other comprehensive income and are then reclassified from equity to profit or loss if the net investment is sold. In the fiscal year 2013/14, two USD loans granted by Kapsch TrafficCom AG to US subsidiaries were classified as net investments in a foreign operation pursuant to IAS 21 since the management board of the Kapsch TrafficCom AG does not plan for a redemption of these loans in the foreseeable future and since such redemption is not likely to occur. The exchange rate differences arising from these loans are recognized in other comprehensive income (see Note 10).

### 5 Risk management.

The group's activities expose it to a variety of financial risks, particularly foreign exchange risk, interest rate risk and credit risk. The group's risk management focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the group's financial performance. The group does not employ hedge accounting as envisaged by IAS 39.

The group has initiated several processes to make risk management more effective and to embed best practice standards. Risk management has been positioned as a separate function within the finance department of Kapsch TrafficCom AG. According to the group's internal control system (ICS), the existing internal control processes relating to financial reporting are documented. Local management is responsible for implementation, design and monitoring of the ICS in order to comply with group-wide guidelines and regulations. An ICS officer has been appointed who assists local management. The main task is to standardize and continuously improve the ICS in the entire Kapsch TrafficCom Group, to monitor the compliance and effectiveness of controls and improve weaknesses, as well as to report regularly to the audit committee of the supervisory board. The internal audit verifies the reliability of the internal control system. The defined processes are based on COSO ERM (Enterprise Risk Management Framework of the Committee of Sponsoring Organizations of the Treadway Commission) and on ONR 49000/ISO 31000 Risk Management Systems, the regulations of the Austrian Standards Institute.

## 5.1 Foreign exchange risk

The foreign exchange risk originates from future business transactions, assets and liabilities as well as net investments of foreign business locations if business transactions are executed in a currency or could come about in the course of normal business operations which are not in conformity with the functional currency of the respectively subsidiary (hereinafter referred to as "foreign currency").

The group operates internationally and is exposed to foreign exchange risk arising from various currency exposures, primarily with respect to the Czech crown, the Polish zloty; the Australian dollar, the South African rand and the US dollar. Because the terms of agreement are stipulated in euros, no foreign exchange risk arises to the group with regard to the Belorussian ruble. Customer orders are mainly invoiced in the local currencies of the group companies. Only in cases in which the group expects to be exposed to significant foreign exchange risk, major orders denominated in foreign currencies will be hedged by forward foreign exchange contracts.

If the exchange rate of the stated currencies (resulting from current and non-current receivables and payables) as of 31 March 2016 (31 March 2015) had increased by the percentage rate ('volatility') stated below, the result before tax, provided all other variables had remained unchanged, would have been higher (+) or lower (-), respectively, by the following amounts:

Currency	Effect on equity in TEUR			
	2015/16		2014/15	
	Volatility +10 %	Volatility -10 %	Volatility +10 %	Volatility -10 %
AUD	-138	169	-107	131
CAD	-416	509	-1,702	2,080
CZK	-319	390	-207	253
EUR	3,573	-4,367	3,768	-4,606
PLN	-141	172	-331	404
SEK	-511	625	-415	507
USD	-4,760	5,817	-3,870	4,730
ZAR	-951	1,162	-836	1,021

The group is exposed to foreign exchange risk from one significant AFS instrument (Q-Free ASA, Norway) as the share is traded in Norwegian crown on the Oslo Stock Exchange.

Currency	Effect on equity in TEUR			
	2015/16		2014/15	
	Volatility +10 %	Volatility -10 %	Volatility +10 %	Volatility -10 %
NOK	-1,348	1,647	-1,754	2,143

## 5.2 Interest rate risk

Interest rate risk is the risk arising from fluctuations in the value of financial instruments, other balance sheet items (e.g. receivables and payables) and/or cash flows due to fluctuations in the market interest rates. For fixed-interest balance sheet items, the risk comprises the present value risk. In case the market interest rate for the financial instrument fluctuates, either a profit or a loss may result if the financial instrument is sold prior to maturity.



In the case of variable-interest balance sheet items, the risk relates to the cash flow. With variable-interest financial instruments, adjustments in the interest rates may result from changes in the market interest rates. Such changes would entail changes in interest payments. Variable-interest (both current and non-current) financial liabilities account for approximately 30 % of interest-bearing financial liabilities. If the market interest rate had been 100 basis points higher (lower) as of 31 March 2016, this, as in the prior year, would not have had any material impact on the result of the group.

Derivative instruments in an insignificant proportion exist in the group to minimize interest rate risk of financial liabilities (see note 21).

### 5.3 Credit risk

As part of the group's risk management policy, the group only engages in business relationships with third parties deemed to be creditworthy and has implemented policies to ensure that the group sells only to customers with appropriate credit histories. In addition, the group monitors its receivables balances on an ongoing basis in order to limit its exposure to bad debts. There is usually a credit risk in the implementation phase of large toll collection projects. With the exception of the toll collection projects in America, Czech Republic, South Africa, Poland and the Republic of Belarus (see note 18), there is no concentration of credit risk relating to trade receivables, since the group generally has a large number of customers worldwide. Based on the group's experiences, the default risk for trade receivables can be considered low.

The maximum credit risk is similar to book values:

All amounts in TEUR	2015/16	2014/15
Other non-current financial assets and investments	18,651	23,099
Other non-current assets	18,877	28,138
Current securities	97	5,291
Trade receivables and other current assets	199,912	205,387
Cash and cash equivalents	140,782	96,765
	<b>378,320</b>	<b>358,680</b>

### 5.4 Liquidity risk

The Kapsch TrafficCom group attaches considerable importance to the ongoing monitoring, control and measurement of financial and liquidity positions in order to reduce financial risk. This crucial task is carried out at the level of the operational entities, is monitored and optimized in the overall group.

The group controls liquidity risks predominantly by maintaining suitable financial reserves, by issuing bonds, through customer pre-payments and the continuous reconciliation of the terms of receivables, liabilities and financial assets. To this end, cash flow forecasts are made at regular intervals for short-term periods (the next 12 weeks), on a quarterly basis for the medium term (current fiscal year) as well as for long-term periods (in accordance with long-term payment obligations, particularly those arising from loans). Suitable measures for ensuring sufficient liquidity are then deducted from these forecasts.

Furthermore, the management monitors the rolling forecasts of the group's liquidity reserves to ensure that it has sufficient liquidity to meet operational needs and also to secure an adequate scope of unutilized credit lines at any time. The Kapsch TrafficCom group holds high amounts of cash which also serve as a liquidity reserve. As a result, the group's liquidity situation is currently good.

The Kapsch TrafficCom group endeavors to reduce the payment default risk of customers as far as possible by mandatory creditworthiness checks prior to the signing of orders and additionally for major projects by securing payments through guarantees. It cannot be completely ruled out, however, that some defaults might still occur, which would then have a major negative impact on the development of the results and liquidity of the Kapsch TrafficCom group.

The Kapsch TrafficCom group avoids becoming dependent on individual banks by making sure that the financial structure is always distributed over several partner banks. Major repayment obligations (pertaining as a rule to long-term contracts, e.g. in the case of corporate bonds or long-term loans with redemption at maturity) are monitored on an ongoing basis. At an early stage, measures are taken to ensure that the agreed-upon payment obligations are met (either by checking the income from operational cash flow or through timely refinancing activities).

The Kapsch TrafficCom group employs a risk-averse investment strategy. Liquid funds are held such that they are generally available in the short term and can therefore be used quickly whenever needed. When it comes to securities, conservative securities funds, which are actively managed on an ongoing basis and include an appropriate share of bonds, are used as a rule for the coverage and hedging of pension obligations. In the event of international financial market turbulence, however, the financial investments made might still develop unfavorably or individual securities might even become untradeable. This might result in reductions in value and impairments, which in turn have a negative impact on the financial result and equity of the Kapsch TrafficCom group. Such a crisis also increases the default risk of individual issuers of securities or their customers. In addition, the group might for strategic reasons acquire a direct interest in individual entities by purchasing shares. A sufficiently bad performance of these entities might also necessitate an impairment, which in turn leads to the mentioned negative impact on the financial result and equity.

### 5.5 Equity price risk

The group is exposed to equity securities price risk resulting from a material investment, since a Norwegian investment (Q-Free ASA, Norway), is classified as available for sale in the consolidated balance sheet.

The table below summarizes the impact of increases/decreases in the stock price of Q-Free ASA, Norway, on the equity. The analysis is based on the assumption that the stock price increases/decreases by 10 % with all other variables held constant.

ISIN	Volatility	Effect on equity in TEUR	
		2015/16	2014/15
NO0003103103	+10 %	1,482	1,929
NO0003103103	-10 %	-1,482	-1,929

### 5.6 Commodity price risk

The group is not exposed to any material commodity price risks.

## 6 Capital management.

Capital management is carried out in line with value-driven and sustainable corporate governance on the basis of the profit and loss accounts of the individual business segments. Accounting ratios and other economic criteria as well as the long-term development of the group are also monitored and taken into account with regard to corporate governance. A crucial ratio for the capital structure is the gearing ratio calculated as the ratio of net

debt to equity. Net debt (net assets) comprises current and non-current borrowings less cash on hand, bank balances and current securities. The Kapsch group's capital management strategy aims among other things to ensure that the group companies' capital resources comply with local requirements. Furthermore, the group focuses on maintaining the gearing ratio on an annual average within a range from 25 % to 35 % in order to be still able to borrow at reasonable cost. The group also continuously monitors if all covenants comply with credit agreements. The highly volatile project business may, nonetheless, be responsible for the gearing ratio strategy and/or the required covenants not being complied with under certain circumstances. Cash and cash equivalents as of 31 March 2016 reached a record height, which resulted in a disclosure of net assets for the previous fiscal year.

In the reporting year, all external capital requirements resulting from the project financing of the nationwide truck toll collection system in the Republic of Belarus were fulfilled.

The objective of these measures is to safeguard the ability to continue as a long-term going concern in order to show to shareholders and other stakeholders that their requirements can be fulfilled in a high-quality and sustainable manner and that returns for shareholders and benefits for other stakeholders can be provided. Other essential objectives of the group's capital management include the financing of the envisaged growth path and the maintenance of an optimal capital structure.

<b>All amounts in TEUR</b>	<b>2015/16</b>	<b>2014/15</b>
Non-current financial liabilities	85,734	88,985
Current financial liabilities	21,349	48,969
<b>Total financial liabilities</b>	<b>107,083</b>	<b>137,954</b>
Cash on hand and at banks	140,782	96,765
Current securities	97	5,291
<b>Net assets /Net debt</b>	<b>33,796</b>	<b>-35,898</b>
Equity	230,658	219,361
<b>Net gearing</b>	<b>n.e.</b>	<b>16 %</b>

## 7 Fair value measurement.

Historical cost is based on the fair value as at the acquisition date. The fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (IFRS 13.9). In measuring the fair value of an asset or a liability, the group takes into account the characteristics of the asset or liability if market participants would take those characteristics into account when pricing the asset or liability at the measurement date (IFRS 13.11).

To the greatest extent possible, the group uses observable market data for the fair value measurement of assets or liabilities. Depending on the availability of observable input factors and their impact on the fair value measurement as a whole, the fair value is assigned to one of three levels in the following fair value hierarchy:

- ▶ Level 1: Inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the group can access at the measurement date.
- ▶ Level 2: Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
- ▶ Level 3: Inputs at this level are unobservable inputs for the asset or liability (IFRS 13.72ff).

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## 8 Borrowing costs.

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets are added to the cost of those assets, until such time as the assets are substantially ready for their intended use or sale. A qualifying asset is an asset (inventories, manufacturing plants, toll collection projects, power generation facilities, intangible assets and investment in properties) that requires a substantial period of time (with regard to the group at least 12 months) to be made ready for its intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization within a specific period.

In the fiscal year 2015/16, none of the assets recognized by the group met the requirements of a qualifying asset; therefore, no borrowing costs were capitalized.

All other borrowing costs are expensed in the period in which they are incurred.

## 9 Property, plant and equipment.

Property, plant and equipment are recognized at acquisition and production cost less accumulated depreciation. Depreciation is charged on a straight-line basis over the expected useful lives of the assets in accordance with the group policies:

Properties are not subject to scheduled depreciation. The useful lives generally range between 3 to 26 years for plants and buildings on leasehold land, 4 to 20 years for technical equipment and machinery, and 3 to 10 years for other equipment, factory and office equipment. The assets' useful lives and residual values are reviewed, and adjusted if appropriate, at the end of each reporting period. An asset's carrying amount is written down to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount.

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the group and the cost of the item can be measured reliably. The carrying amount of those assets which were replaced is derecognized. Expenses for repairs and maintenance which do not necessitate a significant replacement investment (i.e. day to day servicing) are charged to the income statement during the financial period in which they are incurred.

The difference between the proceeds from the disposal of property, plant and equipment and the carrying amount is recognized as profit or loss in the result from operating activities.

## 10 Intangible assets.

### 10.1 Goodwill

Goodwill arises on the acquisition of subsidiaries, associates and joint ventures and represents the excess of the consideration transferred for the acquisition beyond the group's interest in net fair value of the identifiable assets, liabilities and contingent liabilities of the acquiree, the fair value of the non-controlling interest in the acquiree and the fair value of the acquirer's previously held equity interest in the acquiree, if the combination is achieved in stages, at the acquisition date. If the acquisition costs are less than the net assets of the acquired subsidiary measured at fair value, the difference is recognized directly in the statement of comprehensive income.

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Goodwill impairment reviews are undertaken at least annually or more frequently if events or changes in circumstances indicate a potential impairment. As a rule, the group carries out the annual goodwill impairment review in the fourth quarter. In addition, the group carries out impairment tests during the year if a triggering event occurs that may cause the asset to be impaired.

For the purpose of impairment testing, goodwill is allocated to each of the cash generating units (CGU) or groups of cash generating units which are expected to benefit from the synergies of the business combination and have reported the goodwill. Each unit or group of units to which the goodwill is allocated represents the lowest level within the entity at which the goodwill is monitored for internal management purposes.

The carrying value of goodwill is compared to the recoverable amount, which is the higher of value in use and the fair value less costs to sell. If the carrying value of a CGU exceeds the recoverable amount, an impairment is to be recognized. First, goodwill is amortized by the amount of the impairment. If the impairment exceeds the carrying value of goodwill, the carrying values of the remaining assets of this CGU are proportionately reduced.

The value in use of a cash generating unit corresponds to the present value, calculated using the discount cash flow method, of the future cash flows which the entity will receive from the cash generating unit. In order to determine the value in use, the expected future cash flows plus taxes based on the post-tax discount rate that reflects the current market expectations with regard to the interest effect and the specific risks of the cash generating units, are written down to their present values. In the process, the current planning, covering a period of four years (detailed forecast period) and approved by management, is used as the basis with subsequent transition to perpetuity. The growth rates according to the detailed forecast period are based on historical growth rates and on external studies on the future medium-term market development.

The fair value less costs to sell is determined using an appropriate valuation model which is based on the medium-term planning of the respective cash generating unit. The valuation is made in line with the discounted cash flow calculations and verified through suitable multiples, if available.

The impairment loss of goodwill is recognized in the statement of comprehensive income. Write-ups on goodwill are not made.

## **10.2 Concessions and rights**

Computer software, trademarks and similar rights are capitalized on the basis of the costs incurred for acquisition and amortized over their estimated useful lives of 4 to 30 years. Acquired customer agreements (toll contracts, maintenance agreements) are recognized at acquisition costs and amortized over the estimated useful lives that generally range between 2 and 10 years.

## **10.3 Research and development costs**

Research expenditures are recognized as an expense. Costs incurred for development projects (relating to the design and tests of new or improved products) are recognized as intangible assets when the following criteria are fulfilled:

- a) it is technically feasible to complete the intangible asset so that it will be available for use or sale;
- b) management intends to complete the intangible asset and use or sell it;
- c) there is an opportunity to use or sell the intangible asset;

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- d) it can be demonstrated how the intangible asset will generate probable future economic benefits;
  - e) adequate technical, financial and other resources are available to complete the development and to use or sell the intangible asset; and
  - f) the expenditure attributable to the intangible asset during its development can be reliably measured.

Other development expenditures that do not meet these criteria are recognized as an expense. The costs for producing the intangible asset are capitalized as from the point in time when the above criteria are initially met. Development costs previously recognized as an expense cannot be subsequently capitalized. Capitalized development costs are amortized using the straight-line method on the basis of the normal useful life, which generally ranges between three and five years.

Capitalized development assets are tested for impairment annually in accordance with IAS 36, as long as they are not yet available for use.

## **11 Impairment of non-financial assets.**

Assets that have an indefinite useful life – for example, goodwill or intangible assets not ready for use – are not subject to amortization and are tested annually for impairment. Assets that are subject to amortization are reviewed for impairment whenever events or changes in circumstances indicate that the asset should be impaired.

An impairment loss is recognized for the amount by which the asset's carrying value exceeds its recoverable amount. The recoverable amount is the higher of an asset's net selling price and its value in use. For the purpose of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows. Assets, with the exception of goodwill, that have been subject to an impairment adjustment in the past are reviewed for possible reversal of the impairment at each subsequent reporting date.

The difference between the recoverable amount of assets and their carrying amount is recognized as income or expense in the result from operating activities. Gains are not classified as revenue.

The residual carrying values and useful lives are reviewed at each balance sheet date and adjusted as necessary.

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## 12 Financial instruments.

Financial instruments include financial assets (such as securities, investments, non-current receivables, loans, trade receivables and cash and cash equivalents) as well as financial liabilities (such as corporate bonds, other financial liabilities, trade payables, other non-current liabilities and derivative financial instruments).

Financial instruments are subdivided as follows:

- ▶ Financial assets at fair value through profit or loss
- ▶ Held-to-maturity investments
- ▶ Available-for-sale financial assets
- ▶ Loans and receivables

The classification depends on the nature and purpose of the financial assets and is determined on initial recognition.

Financial assets at fair value through profit or loss are financial assets held for trading. A financial asset is classified in this category if acquired principally for the purpose of selling in the short term. Derivatives are also categorized as held for trading unless they are designated as hedges. Assets in this category are classified as current assets if expected to be settled within 12 months, otherwise they are classified as non-current.

Held-to-maturity investments are non-derivative financial assets with fixed or determinable payments and fixed maturity that an entity has the positive intention and ability to hold to maturity.

Available-for-sale financial assets are non-derivatives that are either designated in this category or not classified in any of the other categories. They are included in non-current assets unless the investment matures or management intends to dispose of it within 12 months of the end of the reporting period.

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. They are included in current assets, except for maturities greater than 12 months after the end of the reporting period. These are classified as non-current assets.

### 12.1 Securities and investments

Financial assets recognized under non-current assets and other short-term financial assets include available-for-sale securities, investments and financial assets at fair value through profit or loss.

#### **Available-for-sale securities and investments (AFS)**

Available-for-sale securities and investments are carried at fair value. Unrealized gains and losses arising from the changes in fair value of available-for-sale securities and investments are recognized in other comprehensive income.

The difference arising on the sale of financial assets between the proceeds and the carrying amounts is taken through profit or loss in the statement of comprehensive income. Additionally, the amount recognized in equity is taken through profit or loss in the statement of comprehensive income. All acquisitions and sales are recognized at the respective date of the transaction, with transaction costs being included in acquisition costs.

The group assesses at each balance sheet date whether there is objective evidence of impairment of each significant individual financial asset or group of financial assets.

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If such evidence exists, the group accounts for such impairment, and the amounts of the available-for-sale financial assets previously recognized in equity are removed from equity and recognized through profit or loss in the statement of comprehensive income. The cumulative loss reclassified from equity to profit or loss is the difference between the acquisition cost and the current fair value, less any impairment loss on that financial asset previously recognized in profit or loss.

If, in subsequent periods, the fair value of the impaired financial instrument increases and such increase is directly related to an event occurring after the impairment was recognized through profit or loss in the statement of comprehensive income, the group reverses the impairment loss. In the case of debt instruments, the reversal is recognized in the profit for the period in the statement of comprehensive income; in the case of equity instruments, it is recognized directly in equity.

#### **Financial assets at fair value through profit and loss**

Financial assets at fair value through profit and loss are carried at fair value. Unrealized gains and losses arising from the changes in fair value of financial assets at fair value through profit or loss are recognized immediately in the statement of comprehensive income.

#### **12.2 Other investments**

Other available-for-sale investments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured are initially carried at cost less transaction costs and are recognized at the reporting date less any impairments made.

At each balance sheet date, the group assesses whether there is an objective evidence of impairment of each significant individual financial asset or group of financial assets. If such evidence exists the amount of the loss is measured as difference between the financial asset's carrying amount and the present value of estimated future cash flows discounted at the current market rate of a comparable financial asset. Such impairments must not be reversed.

#### **12.3 Derivative financial instruments**

For accounting purposes, derivative financial instruments are treated as stand-alone derivatives (i.e. as independent transactions and not as hedging transactions). Therefore they qualify as held-for-trading financial instruments and are valued at fair value through profit or loss as attributable as at the date of contract conclusion. The fair value corresponds to the value which the relevant entity would receive or have to pay upon liquidation of the deal on the balance sheet date. Positive market values at the balance sheet date are recognized under financial assets, and negative market values under other liabilities.

Changes in the fair value of these derivative financial instruments are recognized immediately in the statement of comprehensive income within other income or expense or the financial result, depending on the derivative financial instrument's purpose.

The group does not employ hedge accounting as envisaged by IAS 39.



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#### **12.4 Loans and receivables**

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Loans and receivables (e.g. trade receivables, other receivables, cash on hand and at banks) are initially recognized at fair value plus transaction costs and subsequently measured at amortized cost using the effective interest method, less allowance for bad debts.

At each balance sheet date, the group assesses whether there is objective evidence of impairment. Evidence of impairment may include the following: indications that the debtors or a group of debtors is experiencing significant financial difficulties, default or delinquency in interest or principal payments, the probability that they will enter bankruptcy or other financial reorganization, and where observable data indicate that there is a measurable decrease in the estimated future cash flows, such as changes in arrears or economic conditions that correlate with defaults. The amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows (excluding future credit losses that have not occurred) discounted at the financial asset's original effective interest rate.

The amount of the loss is recognized in the statement of comprehensive income.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related to an event occurring after the event was recognized, the reversal of the previously recognized impairment loss is recognized in the statement of comprehensive income.

### **13 Leases.**

#### **13.1 Finance leases – Accounting for agreements from the lessee's perspective**

Leasing agreements in which the group as the lessee bears a substantial part of the risks and rewards associated with the use of an asset are accounted for as finance leases.

The respective assets are capitalized under non-current assets at the net present value of minimum lease payments or the fair value of the leased asset, whichever is lower, and are depreciated over their expected useful lives. A liability with regard to finance leases is recognized in the same amount. The difference between the minimum lease payments and the accrued net present value is recognized as interest expense. The interest component is spread over the agreed term of the lease using the effective interest rate method.

#### **13.2 Operating leases – Accounting for agreements from the lessee's perspective**

Leases in which a substantial part of the risks and rewards associated with the use of an asset are retained by the lessor are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are charged as rental expense to the statement of comprehensive income on a straight-line basis over the period of the lease.

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## 14 Government grants.

Government grants with regard to purchased non-current assets (technical equipment) are deferred and taken through profit or loss over the estimated useful life of the respective asset. Government grants are recognized at their fair value, provided it is sufficiently certain that the group will comply with all attached conditions and the grant will be received.

Other government grants received as compensation for expenses or losses already incurred are immediately taken through profit or loss.

## 15 Inventories.

Inventories are stated at cost or, if lower, at net realizable value. Cost is determined using the moving average price method. Production cost includes all directly attributable expenses and fixed and variable overheads (based on normal operating capacity) incurred in connection with the production. It excludes, however, borrowing costs as they cannot be allocated to a qualifying asset. Net realizable value is the estimated selling price in the ordinary course of business less applicable variable selling expenses.

## 16 Construction contracts.

The group accounts for construction contracts in accordance with IAS 11. When the outcome of a construction contract can be estimated reliably and it is probable that the contract will be profitable, contract revenue is recognized over the period according to the percentage of completion of the contract. When it is probable that total contract costs will exceed total contract revenue, the expected loss is recognized as an expense immediately. The construction progress is represented by the ratio of costs incurred by the balance sheet date and the estimated total costs for the respective project.

If the result of the construction contract cannot be reliably determined, contract revenue will only be recognized in the amount of the contract costs incurred which are likely to be recoverable. Contract costs are recognized as expenses in the period in which they occur.

The carrying amount results from comparing the total of accumulated costs incurred by the balance sheet date plus the profit calculated according to the percentage of completion method (prorated) or loss (in full) on the respective construction contract to the invoiced amounts. Depending on maturity, the balance is recognized either under non-current assets, under current assets (amounts due from customers for contract work) or under current liabilities (amounts due to customers for contract work). Any amounts received prior to the rendering of production services are recognized in the consolidated balance sheet as liabilities under prepayments received.

## 17 Trade receivables.

Trade receivables are amounts due from customers for merchandise sold or services performed in the ordinary course of business. Receivables with a remaining term of up to one year are recognized as current receivables; all others are recognized as non-current receivables.

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## **18 Cash and cash equivalents.**

In the presentation of the cash flow statement, cash and cash equivalents include cash on hand, deposits held at call and other cash at banks. Overdrafts are recognized in the balance sheet under current financial liabilities.

## **19 Provisions.**

Provisions are set up when the group has a present legal or constructive obligation to third parties as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and a reliable estimate of the amount can be made. If such a reliable estimate is not possible, no provisions are set up. Provisions are measured based on the present value of the estimated settlement amount. The settlement amount is the best possible estimate of an expense on the basis of which a current obligation might be settled at the balance sheet date or transferred to a third party. This estimate takes into account future cost increases that are foreseeable and likely to occur on the balance sheet date. If they are material, provisions are discounted using a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the obligation. The increase in the provision due to passage of time is recognized as interest expense.

Provisions for warranties and liabilities for construction flaws, serial and systems problems mainly serve as coverage for obligations for free repairs and replacement deliveries, in accordance with the general sales and delivery conditions or due to individual agreements, and are measured on the basis of the group of obligations, using rates based on past experience regarding direct labor and material costs incurred, overheads, replacement deliveries or rebates. A provision is recognized for the best estimate of the costs incurred for defects to be rectified under the warranty for products sold before the balance sheet date.

Provisions for onerous contracts are recognized if the expected benefit to be derived from the contract is less than the unavoidable costs of meeting the obligations under the contract. The provision is measured at the present value of the amount from the fulfillment of the contract or any compensation payments in case of non-performance, whichever is lower. The recognition of impairment losses on assets dedicated to such "onerous" contracts is, however, established prior to the recognition of the provisions for onerous contracts.

## **20 Employee benefits.**

The group provides various post-employment benefits to employees and other long-term benefits either based on individual agreements or in accordance with local labor law provisions.

A defined contribution plan is a pension plan under which the group pays fixed contributions into a separate non-group entity (fund). The group has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee service in the current and prior periods. A defined benefit plan is a pension plan that is not a defined contribution plan.

Typically, defined benefit plans define an amount of pension benefit that an employee will receive on retirement, usually dependent on one or more factors such as age, years of service and compensation.

The projected unit credit method is used for the calculation of liabilities arising from pension obligations and termination benefits in accordance with IAS 19. According to this method, post-employment costs for employee benefits are recognized in the statement of comprehensive income in such a way that scheduled costs are spread over the employees' years of service on the basis of an expert opinion by a qualified actuary, who

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completely re-measures the schemes annually. The obligations for pension payments are calculated at the present value of future benefits using interest rates of high-quality corporate bonds whose term roughly equals the term of the liability. The liability recognized in the balance sheet with respect to defined benefit pension plans is the present value of the defined benefit obligation at the end of the reporting period less the fair value of plan assets.

Costs arising from defined benefit plans from pension obligations and termination benefits include the following components:

- ▶ Service costs include current as well as past service costs as well as gains or losses from benefit changes or curtailments. Service Costs are recognized in profit or loss within staff costs.
- ▶ The net interest cost on the defined benefit obligation or plan asset. This component is included in interest expense in the statement of comprehensive income.
- ▶ Remeasurements of the net defined benefit obligation or net asset. They are charged or credited to other comprehensive income in the period in which they arise.

Contributions paid by the group under a defined contribution pension scheme are charged to the statement of comprehensive income under staff costs in the period in which they occur.

For the calculation of liabilities arising from obligations for jubilee bonuses in accordance with IAS 19, the projected unit credit method is used. Jubilee bonuses are special lump-sum payments stipulated in the Collective Agreement and dependent on compensation and years of service. Eligibility is determined by a certain number of service years. The calculation of liabilities arising from obligations for jubilee bonuses is performed in a similar way as the calculation for liabilities arising from termination benefits. The expected expenses of these benefits are recognized in the result for the period.

## **21 Current and deferred income tax.**

The tax expense for the period comprises current and deferred tax. Tax is generally recognized in the statement of comprehensive income. Only taxes that relate to items recognized in other comprehensive income are recognized in other comprehensive income.

The current income tax charge is calculated on the basis of the tax laws applicable at the balance sheet date in the countries where the subsidiaries and associates operate and generate taxable income. The local management is responsible together with the local fiscal representative for the preparation of tax returns, particularly relating to matters subject to interpretations and for setting up provisions, if reasonable, for amounts payable to tax authorities.

Deferred income tax assets/liabilities are provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, if the deferred income tax assets/liabilities arise from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither IFRS profit or loss nor taxable profit or loss, it is not accounted for. Likewise, deferred taxes are not recognized if they arise from the initial recognition of goodwill.

Deferred income tax assets/liabilities are determined using tax rates (and laws) that have been enacted or substantially enacted by the balance sheet date and are expected to apply when the related deferred income tax asset is realized or the deferred income tax liability is settled.

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Deferred income tax assets are recognized to the extent that it is probable that future taxable profit will be available against which the temporary differences can be utilized. In addition, it is to be assumed that such temporary differences will be reversed in the foreseeable future.

The carrying value of deferred income tax assets is reviewed annually at the balance sheet date and impaired if it is no longer likely that sufficient taxable income will be available to realize such assets partially or in full.

Temporary differences mainly arise in connection with depreciation (amortization) periods of non-current assets, provisions for pension benefits, other post-employment benefits, differences regarding the measurement of receivables and payables and tax loss carry-forwards.

Deferred income tax liabilities are provided on temporary differences arising on investments in subsidiaries and associates, except where the timing of the reversal of the temporary difference is controlled by the group and it is probable that the temporary difference will not be reversed in the foreseeable future.

Taking into account the corresponding terms, deferred income tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income taxes assets and liabilities relate to income taxes levied by the same taxation authority on the same taxable entity.

## **22 Liabilities.**

Liabilities are recognized at amortized cost using the effective interest rate method. Liabilities with a remaining term of up to one year are recognized as current liabilities, those with longer terms are recognized as non-current liabilities. Liabilities denominated in foreign currencies are measured at the current rate at the balance sheet date. Borrowings are initially recognized at fair value, net of transaction costs incurred, and subsequently stated at amortized cost. Borrowing costs are charged to the statement of comprehensive income in the period in which they are incurred.

## **23 Contingent liabilities.**

Contingent liabilities occur for two reasons. For one, they comprise possible obligations that arise from past events and whose existence will be confirmed by uncertain future events that are at least partly beyond the group's control. For another, they comprise present obligations that fail to meet general or special recognition standards (i.e. the amount of an obligation cannot be measured with sufficient reliability or an outflow of resources to settle the obligations is not deemed probable).

The group discloses contingent liabilities unless the possibility of an outflow of resources embodying economic benefits is remote and a liability does not have to be recognized pursuant to IFRS.

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## 24 Revenue recognition.

In accordance with IAS 18, revenue is recognized at the fair value of the compensation received or outstanding in the statement of comprehensive income upon delivery and once the significant risks and rewards of ownership of the goods are transferred to the customer, net of discounts, other price reductions and eliminated sales within the group.

Revenues from sales of services are recognized in the reporting period in which the services are rendered, by reference to the rate of completion of the specific transaction assessed on the basis of the actual service provided as a proportion of the total services to be provided.

Revenues from sales of maintenance relate to the services under the single maintenance contracts rendered in the respective reporting period.

Revenue for construction contracts (mainly toll collection projects) is recognized in accordance with the percentage-of-completion method provided the conditions under IAS 11 are met.

Other revenue is recognized by the group as follows:

- ▶ Revenue from expenses recharged is recognized on the basis of the accumulated amounts in accordance with the respective agreements.
- ▶ Interest income is recognized on a time-proportion basis using the effective interest method.
- ▶ Dividend income is recognized when the right to receive payment is established.

## 25 Material accounting estimates and assumptions with regard to accounting policies.

The group makes estimates and assumptions concerning the future development. The resulting accounting estimates will, by definition, rarely equal the related actual results. All estimates and judgments are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

In particular, estimates and assumptions regarding revenue recognition have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next fiscal year.

### 25.1 Percentage-of-completion method for contract work

The group uses the percentage-of-completion method in accounting for its construction contracts. At the balance sheet date of 31 March 2016, the amounts due from customers for contract work amounted to TEUR 116,462 (2014/15: TEUR 110,983) and the amounts due to customers for contract work amounted to TEUR 20,340 (2014/15: TEUR 17,786). The use of the percentage-of-completion method requires the group to estimate the expected profit mark-up for the construction contract. Sensitivity analyses on assumptions made by the executive board of Kapsch TrafficCom AG indicate that the operating result would fluctuate by TEUR 11,090 (2014/15: TEUR 10,104) and the total comprehensive income for the period would fluctuate by TEUR 8,188 (2014/15: TEUR 7,578) if the actual margin of the significant projects deviated by 10% from estimates. The analysis of assumptions made in the past as well as of actual profit mark-ups showed that the estimates had been reliable up to now.

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## **25.2 Estimated impairment of goodwill**

In accordance with the accounting policy stated in note 3, the group tests annually whether goodwill has suffered any impairment. The recoverable amount of cash generating units is determined on the basis of the calculation of the value in use. These calculations require the use of estimates.

Sensitivities for the acquired goodwill are detailed in note 13.

## **25.3 Further assumptions and estimates**

Further areas where assumptions and estimates are significant to the consolidated financial statements include inventories, deferred income tax assets/liabilities, liabilities from post-employment benefits to employees and provisions for warranties, project risks and losses. Sensitivity analyses of the assumptions made by management in connection with inventories, deferred income tax assets/liabilities and provisions indicate that no material effect will arise if the actual final outcomes were to differ from the estimates made by 10 %.

The sensitivities for obligations for post-employment benefits to employees are detailed in note 23.

## **26 Critical judgments in the application of accounting policies.**

As a non-financial entity, the group does not have a major investment portfolio and currently holds only one significant AFS financial instrument (Q-Free ASA, Norway); refer to Note 15. Against this backdrop, no fixed rates or time bands were defined to establish whether a “significant” or a “prolonged” decline in accordance with IAS 39.61 exists. As a consequence, the Group measures equity instruments classified as “available for sale” on an individual basis, taking particularly into account qualitative criteria (e.g. volatility of equity instruments held, trading volume or adverse developments of the issuer). It is especially with instruments of lower liquidity and/or high volatility that higher percentages (of up to 30%) are used to establish whether a decline in value is considered to be “significant”.

## **27 Segment information.**

The reporting on operating segments is consistent with the internal reporting provided to the chief operating decision-maker (management approach). The chief operating decision-maker is responsible for allocating resources to the operating segments and assessing their performance. The executive board has been identified as the chief operating decision-maker.

With regard to the change in segment reporting made in fiscal year 2015/16 we refer to general information in the notes to the consolidated financial statements as well as to note 13.

# Notes to the Consolidated Financial Statements.

Figures in the disclosure notes are presented in euro thousands (TEUR) unless otherwise stated.

## 1 Segment Information.

### Operating segments

The group reports two operating segments (see section "General Information"):

- ▶ Electronic Toll Collection (ETC)
- ▶ Intelligent Mobility Solutions (IMS)

The segment information, considering the new segment structure as described in the section General information, follows the same principles and same accounting policies as applied in these consolidated financial statements.

The segment results for the fiscal year ended 31 March 2016 are as follows (in EUR million):

	ETC	IMS	Consolidated group
Revenues	442.1	84.0	526.1
Operating result	63.7	-1.3	62.3

The segment results for the fiscal year ended 31 March 2015 are as follows (in EUR million):

	ETC	IMS	Consolidated group (adjusted)
Revenues	389.3	67.1	456.4
Operating result	33.5	-0.8	32.7

The adjustment of the fiscal year 2014/15 results from the new reporting structure.

The segment assets and liabilities as of 31 March 2016 as well as capital expenditure, depreciation, amortization and impairment and other non-cash-effective positions for the period then ended are as follows (in EUR million):

	ETC	IMS	Consolidated group
Assets	299.0	41.3	340.3
Investments in associates	0.0	1.9	1.9
Liabilities	153.0	19.7	172.7
Capital expenditure	8.4	1.6	10.0
Depreciation, amortization and impairment	12.1	2.5	14.5
Other non-cash-effective positions	0.3	0.3	0.6

The segment assets include property, plant and equipment, intangible assets, other non-current assets, inventories as well as trade receivables and other current assets.

The segment liabilities include liabilities from post-employment benefits to employees, non-current provisions, other non-current liabilities, trade payables, other liabilities and deferred income, current tax payables as well as current provisions.



The segment assets and liabilities as of 31 March 2015 as well as capital expenditure, depreciation, amortization and impairment and other non-cash-effective positions for the period then ended are as follows (in EUR million):

	ETC	IMS	Consolidated group (adjusted)
Assets	328.2	46.6	374.8
Investments in associates	1.9	0.1	2.0
Liabilities	128.4	27.5	155.9
Capital expenditure	7.0	1.4	8.4
Depreciation, amortization and impairment	27.1	1.7	28.8
Other non-cash-effective positions	13.5	0.1	13.5

The adjustment of the fiscal year 2014/15 results from the new reporting structure.

The breakdown of revenue by customer who contributed more than 10 % to the result for the year is as follows. In addition, the respective segments are shown (in EUR million):

	2015/16			2014/15 (adjusted)		
	Revenues	ETC	IMS	Revenues	ETC	IMS
Customer 1	84.6	x	x	79.2	x	x
Customer 2	68.3	x		66.4	x	
Customer 3	58.3	x		40.2	x	
Customer 4	50.7	x		52.5	x	

The adjustment of the fiscal year 2014/15 results from the new reporting structure.

#### Information by region

Revenues are segmented by the location of the customer and balance sheet figures by the location of the company.

The figures for the fiscal year ended 31 March 2016 are as follows (in EUR million):

	Austria	EMEA (excl. Austria)	Americas	APAC	Consolidated group
Revenues	39.8	332.2	118.2	35.9	526.1
Non-current non-financial assets	15.1	32.7	30.1	7.9	85.8

The figures for the fiscal year ended 31 March 2015 are as follows (in EUR million):

	Austria	EMEA (excl. Austria)	Americas	APAC	Consolidated group (adjusted)
Revenues	38.2	297.9	92.6	27.7	456.4
Non-current non-financial assets	17.0	37.0	31.8	7.8	93.6

The adjustment of the fiscal year 2014/15 results from the new reporting structure.

### Revenues per category

Revenues are classified into the following categories:

	2015/16	2014/15
Sales of goods	132,474	122,072
Sales of services	344,391	367,157
Sales of maintenance	32,755	33,183
Accrued/deferred sales, license sales and discounts on invoiced sales	16,472	-66,035
	<b>526,092</b>	<b>456,377</b>

### 2 Other operating income.

	2015/16	2014/15
Exchange rate gains from operating activities	6,776	10,458
Research tax credits	1,394	2,427
Income from the sale of non-current assets	35	293
Income from costs recharged	105	106
Sundry operating income	8,718	7,937
	<b>17,028</b>	<b>21,221</b>

Sundry operating income mainly relates to the assumption of costs of transactions billed for the nationwide electronic truck toll collection system in the Czech Republic.

### 3 Change in finished and unfinished goods and work in progress.

	2015/16	2014/15
Change in unfinished goods and work in progress	-8,129	-759
Change in finished goods	-4,162	-4,517
	<b>-12,291</b>	<b>-5,276</b>

### 4 Costs of materials and other production services.

	2015/16	2014/15
Cost of materials	84,696	74,766
Cost of purchased services	117,165	93,268
	<b>201,861</b>	<b>168,034</b>

### 5 Staff costs.

	2015/16	2014/15
Wages, salaries and other remunerations	127,258	121,129
Expenses for social security and payroll-related taxes and contributions	19,948	20,775
Expenses for termination benefits (see Note 23)	259	281
Expenses for pensions (see Note 23)	7	11
Contributions to pension funds and other external funds (see Note 23)	1,390	1,214
Fringe benefits	4,300	4,693
	<b>153,161</b>	<b>148,102</b>

As of 31 March 2016, the number of staff amounted to persons 3,716 (31 March 2015: 3,545 persons) and averaged 3,514 persons in the fiscal year 2015/16 (2014/15: 3,510 persons).

## 6 Amortization of intangible assets, depreciation of property, plant and equipment and impairment.

	2015/16	2014/15
Depreciation of property, plant and equipment	6,905	7,676
Amortization of intangible assets	7,628	8,758
Impairment	0	12,342
	<b>14,533</b>	<b>28,776</b>

## 7 Other operating expenses.

	2015/16	2014/15
Communication and IT expenses	18,359	18,862
Legal and consulting fees	17,851	10,860
Rental expenses	13,326	13,073
Exchange rate losses from operating activities	8,140	6,974
Travel expenses	7,783	6,840
Marketing and advertising expenses	6,518	6,959
License and patent expenses	3,971	3,972
Automobile expenses	3,835	4,524
Office expenses	3,418	3,025
Maintenance	3,388	3,347
Insurance costs	3,371	3,242
Taxes and charges	1,795	1,524
Warranty costs and project financing	1,630	1,796
Training costs	1,664	1,714
Transport costs	1,049	939
Bank charges	737	562
Adjustment of provision for warranties	624	331
Membership fee	545	373
Losses on disposal of non-current assets	508	227
Commissions and other fees	268	515
Remuneration to supervisory board	120	54
Damages	63	1,720
Allowance and write-off of receivables	43	995
Reorganisation costs	0	1,760
Other	631	575
	<b>99,636</b>	<b>94,763</b>

The increase in legal and consulting fees by TEUR 6,991 mainly relates to current legal cases and consulting fees for acquisitions.

The item "Other" includes other administrative and selling expenses.

## 8 Financial result.

	2015/16	2014/15
<b>Interest and similar income:</b>		
Interest income	2,610	1,690
Income from securities	69	84
Income from interest accretion of non-current receivables	3,698	5,946
Gains from the disposal of financial assets	3,362	0
Exchange rate gains from financing activities	3,162	5,536
	<b>12,902</b>	<b>13,255</b>
<b>Interest and similar expenses:</b>		
Interest expense	-5,227	-5,983
Impairment of other investments	-1,513	-18,525
Expense from interest accretion of non-current payables	-264	-252
Exchange rate losses from financing activities	-12,724	-742
Interest expense from liabilities from post-employment benefits to employees	-509	-757
Interest expense from liabilities from anniversary bonuses to employees	-23	0
Expense from change in fair value of derivative financial instruments	-213	-47
	<b>-20,474</b>	<b>-26,307</b>
	<b>-7,572</b>	<b>-13,051</b>

The exchange rate gains/losses from financing activities in the group mainly result from exchange rate fluctuations of the translation of intercompany financing of subsidiaries in North America and South Africa.

The impairment of other investments in fiscal year 2014/15 concern the impairment, recognized in the interim financial report of the second quarter as impairment in the result for the period, due to the ongoing unfavorable development of the share price of the investment in Q-Free ASA, Trondheim, Norway amounting to TEUR 12,185 (see Note 10) as well as further net exchange losses in the third quarter of the fiscal year 2014/15 amounting to TEUR 6,340. In the fourth quarter of the fiscal year 2014/15 the exchange rate has recovered again and the increase in value was recognized in the other comprehensive income.

## 9 Income taxes.

	2015/16	2014/15
Current taxes	-15,445	-9,909
Deferred taxes (see Note 22)	-2,911	1,385
<b>Total</b>	<b>-18,356</b>	<b>-8,524</b>
Thereof income/expense from group taxation	-5,276	-4,641

The reasons for the difference between the arithmetic tax expense/income based on the Austrian corporate income tax rate of 25 % and the recognized tax expense/income are as follows:

	2015/16	2014/15
Result before income taxes	54,815	19,932
Arithmetic tax expense based on a tax rate of 25 % (2014/15: 25 %)	-13,704	-4,983
Unrecognized deferred tax assets on current losses	-6,305	-14
Utilization of previously unrecognized tax losses	0	2,895
Different foreign tax rates	3,134	-3,310
Tax allowances claimed and other permanent tax differences	-480	-4,892
Income and expenses not subject to tax and other differences	1,123	1,152
Adjustment in respect to prior year	-2,123	628
<b>Recognized tax expense</b>	<b>-18,356</b>	<b>-8,524</b>

In the fiscal year 2014/15 a disproportionate high tax rate arises due to the non-tax effective impairment of the investment in Q-Free ASA, Norway (effects from tax allowances claimed and other permanent tax differences in the amount of TEUR 4,631).

For further information on deferred tax assets and liabilities see Note 22.

## 10 Other comprehensive income.

2015/16	Before taxes	Tax expense/ income	After taxes
Fair value gains/losses on available-for-sale financial assets:			
Unrealized gains/losses in the current period	-4,607	10	-4,597
Gains/losses recognized in the result for the period	-2,081	829	-1,251
Remeasurements of liabilities from post-employment benefits	-231	93	-139
Currency translation differences	2,505	0	2,505
Currency translation differences from net investments in foreign business	-2,334	584	-1,751
<b>Fair value changes recognized in equity</b>	<b>-6,748</b>	<b>1,515</b>	<b>-5,233</b>

The unrealized gains/losses on available-for-sale financial assets recognized in the fiscal year 2015/16 amounting to TEUR -4,567 relate to fair value changes on the investment in Q-Free ASA, Trondheim, Norway. Due to the ongoing unfavorable development of the share price up to the third quarter of the fiscal year 2015/16 the contained net losses amounting to TEUR -5.432, together with net losses that have been recognized through other comprehensive income in equity in the amount of TEUR 4,194 up to 31 March 2015, were recognized as impairment in the result for the period (TEUR -1,238; reclassification from other comprehensive income to the result for the period).

The realized gains/losses on available-for-sale financial assets relate to a sale of joint ownership shares (ESPA Cash Asset-Backed) in the fiscal year 2015/16. Net gains recognized in equity in the amount of TEUR 3,318 up to 31 March 2015 were also reclassified in the result for the period.

2014/15	Before taxes	Tax expense/ income	After taxes
<b>Fair value gains/losses on available-for-sale financial assets:</b>			
Unrealized gains/losses in the current period	2,031	-129	1,902
Gains/losses recognized in the result for the period	12,185	0	12,185
Remeasurements of liabilities from post-employment benefits	-3,164	646	-2,519
Currency translation differences	-12,559	0	-12,559
Currency translation differences from net investments in foreign business	9,045	-2,261	6,784
<b>Fair value changes recognized in equity</b>	<b>7,538</b>	<b>-1,744</b>	<b>5,794</b>

The unrealized gains/losses on available-for-sale financial assets relate to market price fluctuations of the investment in Q-Free ASA, Norway, amounting to TEUR 1,516.

The realized gains/losses on available-for-sale financial assets relate to an impairment in that investment, recognized in the result of the period (TEUR 12,185, reclassification from other comprehensive income to the result for the period, see note 8) due to ongoing unfavorable development of the share price.

## 11 Additional disclosures on financial instruments by category.

### 11.1 Assets

	Note	2015/16	2014/15
<b>At fair value through profit or loss</b>			
Derivative financial instruments	—	0	0
		<b>0</b>	<b>0</b>
Financial instruments held-to-maturity		0	0
<b>Securities held-to-maturity</b>	<b>—</b>	<b>0</b>	<b>0</b>
<b>Receivables (financial assets recognized at (amortized) cost)</b>			
Non-current receivables	(16)	783	1,151
Loans	(15)	196	0
Trade receivables	(18)	51,425	72,754
Cash and cash equivalents	(19)	140,782	96,765
		<b>193,186</b>	<b>170,670</b>
<b>Available-for-sale financial assets</b>			
Available-for-sale securities (non-current), Level 1	(15)	3,030	3,085
Available-for-sale securities (non-current), Level 2	(15)	693	718
Available-for-sale investments, Level 1	(15)	14,825	19,291
Available-for-sale securities (current), Level 1	(15)	0	5,291
Other investments (at cost)	(15)	4	5
		<b>18,552</b>	<b>28,390</b>
<b>Total</b>		<b>211,739</b>	<b>199,060</b>

## 11.2 Liabilities

	Notes	2015/16	2014/15 (adjusted)
<b>At fair value through profit or loss</b>			
Derivative financial instruments	—	0	47
Other non-current liabilities	(24)	2,349	2,324
		<b>2,349</b>	<b>2,372</b>
<b>Loans (financial liabilities recognized at (amortized) cost)</b>			
Corporate bond	(21)	70,513	74,485
Other financial liabilities	(21)	36,570	63,469
Trade payables	—	52,041	48,441
Other non-current liabilities	(24)	983	2,332
		<b>160,107</b>	<b>188,727</b>
<b>Total</b>		<b>162,456</b>	<b>191,099</b>

Financial instruments are recognized in the statement of comprehensive income with the following net results:

	2015/16	2014/15
Available-for-sale financial assets	1,918	-18,442
Loans and receivables	-6,743	6,700
Financial liabilities recognized at (amortized) cost	-5,491	-6,235
At fair value through profit or loss	-237	-47
	<b>-10,553</b>	<b>-18,025</b>

## 12 Property, plant and equipment.

	Land and buildings	Technical equipment and machinery	Construction in progress	Other equipment, factory and office equipment	Prepayments	Total
<b>Carrying amount as of 31 March 2014</b>	<b>3,961</b>	<b>9,150</b>	<b>1,407</b>	<b>8,859</b>	<b>71</b>	<b>23,447</b>
Currency translation differences	102	520	316	332	0	1,270
Reclassification	1,106	0	-1,179	-820	0	-893
Additions	290	2,812	2,300	1,785	188	7,374
Disposals	0	-123	-749	-187	-71	-1,130
Scheduled depreciation	-886	-3,449	0	-3,341	0	-7,676
<b>Carrying amount as of 31 March 2015</b>	<b>4,572</b>	<b>8,909</b>	<b>2,096</b>	<b>6,628</b>	<b>188</b>	<b>22,393</b>
Acquisition/production costs	10,350	51,304	2,096	24,873	188	88,811
Accumulated depreciation	-5,778	-42,395	0	-18,245	0	-66,417
<b>Carrying amount as of 31 March 2015</b>	<b>4,572</b>	<b>8,909</b>	<b>2,096</b>	<b>6,628</b>	<b>188</b>	<b>22,393</b>
<b>Carrying amount as of 31 March 2015</b>	<b>4,572</b>	<b>8,909</b>	<b>2,096</b>	<b>6,628</b>	<b>188</b>	<b>22,393</b>
Currency translation differences	-49	-504	-83	-449	0	-1,084
Reclassification	375	201	-2,351	1,775	0	0
Reclassification of prepayments	0	188	0	0	-188	0
Additions from the acquisition of companies	0	843	401	7	0	1,251
Additions	665	1,463	1,302	3,619	0	7,049
Disposals	-7	-705	-448	-677	0	-1,837
Scheduled depreciation	-929	-2,406	0	-3,570	0	-6,905
<b>Carrying amount as of 31 March 2016</b>	<b>4,628</b>	<b>7,989</b>	<b>917</b>	<b>7,333</b>	<b>0</b>	<b>20,867</b>
Acquisition/production costs	10,655	45,743	917	26,313	0	83,628
Accumulated depreciation	-6,027	-37,754	0	-18,979	0	-62,761
<b>Carrying amount as of 31 March 2016</b>	<b>4,628</b>	<b>7,989</b>	<b>917</b>	<b>7,333</b>	<b>0</b>	<b>20,867</b>



### 13 Intangible assets.

	Capitalized development costs	Concessions and rights	Goodwill	Intangible assets on completion	Prepayment	Total
<b>Carrying amount as of 31 March 2014</b>	<b>0</b>	<b>26,393</b>	<b>56,663</b>	<b>734</b>	<b>5,778</b>	<b>89,567</b>
Currency translation differences	0	48	1,007	0	0	1,054
Reclassification	0	893	0	0	0	893
Additions	0	446	0	329	219	994
Disposals	0	-1	0	-156	0	-157
Impairment	0	0	-12,342	0	0	-12,342
Scheduled amortization	0	-8,758	0	0	0	-8,758
<b>Carrying amount as of 31 March 2015</b>	<b>0</b>	<b>19,019</b>	<b>45,328</b>	<b>907</b>	<b>5,997</b>	<b>71,250</b>
Acquisition/production costs	8,302	62,310	59,727	907	5,997	137,243
Accumulated amortization	-8,302	-43,291	-14,399	0	0	-65,992
<b>Carrying amount as of 31 March 2015</b>	<b>0</b>	<b>19,019</b>	<b>45,328</b>	<b>907</b>	<b>5,997</b>	<b>71,250</b>
<b>Carrying amount as of 31 March 2015</b>	<b>0</b>	<b>19,019</b>	<b>45,328</b>	<b>907</b>	<b>5,997</b>	<b>71,250</b>
Currency translation differences	-2	-72	0	0	0	-74
Reclassification of prepayments	0	5,997	0	0	-5,997	0
Additions from the acquisition of companies	46	0	0	0	0	46
Additions	149	2,606	0	58	132	2,944
Disposals	0	-663	0	-964	0	-1,627
Scheduled amortization	-194	-7,435	0	0	0	-7,628
<b>Carrying amount as of 31 March 2016</b>	<b>0</b>	<b>19,452</b>	<b>45,328</b>	<b>0</b>	<b>132</b>	<b>64,911</b>
Acquisition/production costs	9,725	66,227	59,727	0	132	135,810
Accumulated amortization	-9,725	-46,775	-14,399	0	0	-70,899
<b>Carrying amount as of 31 March 2016</b>	<b>0</b>	<b>19,452</b>	<b>45,328</b>	<b>0</b>	<b>132</b>	<b>64,911</b>

In consideration of restructuring of the business segments and reportable segments Kapsch TrafficCom Group has revised the representation of cash-generating units (CGU) and goodwill allocation.

According to IAS 36.72 the CGUs have been adjusted to the changed structure of the business segments and reportable segments. The reallocation of goodwill complies with IAS 36.87, according to which goodwill have to be reallocated based on a relative value approach, similar to that used for selling of a business unit within a CGU of a company.

Based on the revised business segments and reportable segments (see segment reporting) Kapsch TrafficCom Group defines the following cash-generating units for the purpose of impairment testing according to IAS 36:

	2015/16	2014/15 <sup>1</sup>
ZGE ETC-Americas: Electronic Toll Collection, Americas	11,723	n/a
ZGE ETC-EMEA: Electronic Toll Collection, Europe, Middle East and Africa	19,941	n/a
ZGE ETC-APAC: Electronic Toll Collection, Asia and Pacific	7,378	n/a
ZGE IMS-Americas: Intelligent Mobility Solutions, Americas	3,349	n/a
ZGE IMS-EMEA: Intelligent Mobility Solutions, Europe, Middle East and Africa	2,708	n/a
ZGE IMS-APAC: Intelligent Mobility Solutions, Asia and Pacific	230	n/a
	<b>45,328</b>	<b>n/a</b>

1 The disclosure for the fiscal year 2014/15 is not applicable due to the new reporting structure.

The following key assumptions for all cash-generating units were made for the purpose of impairment testing:

	2015/16	2014/15
Determination of recoverable amount	Value in use	Value in use
Detailed planning period	4 years	4 years
Discount rate after tax	6.36 %	8.28 %
Long-term growth rate	2.00 %	2.00 %

### 13.1 Cash-generating unit "Electronic Toll Collection, Americas" (CGU ETC-Americas)

#### Key assumptions for determining expected cash flows of the CGU ETC-Americas

Management has based its determination on the assumption that after the successful implementation of road toll collection systems, in particular in the U.S.A. and Chile, demand for toll systems will remain stable. The planning for the CGU ETC-Americas is based on implemented construction projects and current operation projects and their expansion as well as on the fact, that in various countries invitations to tender are in preparation or already in progress. Furthermore the delivery of components makes a substantial contribution to revenue.

#### Parameter CGU ETC-Americas

	2015/16	2014/15 <sup>1</sup>
Carrying amount of goodwill allocated to the CGU	11,723	n/a
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	n/a
Value in use of the CGU	232,044	n/a
Carrying amount	48,580	n/a
Discount rate before tax	7.6 %	n/a
Break-Even discount rate	31.1 %	n/a

<sup>1</sup> The disclosure for the fiscal year 2014/15 is not applicable due to the new reporting structure.

#### Sensitivity analyses with the impact of changes to the value in use of the CGU ETC-Americas

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	38,577	-28,750
Revenue growth	±10 %	-6,817	6,934
EBITDA margin	±10 %	-2,712	2,712
Long-term growth rate	±0,5 %	-21,127	26,606

### 13.2 Cash-generating unit „Electronic Toll Collection, Europe, Middle East and Africa" (CGU ETC-EMEA)

#### Key assumptions for determining expected cash flows of the CGU ETC-EMEA

Management has based its determination on the assumption that after the successful implementation of road toll collection systems in EMEA, in particular in Austria, the Czech Republic, Switzerland, South Africa, Poland and the Republic of Belarus, demand for toll systems will remain stable, in particular as a result of tight public budgets. The planning for the CGU ETC-EMEA is based on implemented construction projects and current operation projects, their expansion and delivery of components as well as on the fact, that in various countries invitations to tender are in preparation or already in progress.

#### Parameter CGU ETC-EMEA

	2015/16	2014/15 <sup>1</sup>
Carrying amount of goodwill allocated to the CGU	19,941	n/a
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	n/a
Value in use of the CGU	394,719	n/a
Carrying amount	120,615	n/a
Discount rate before tax	7.9 %	n/a
Break-Even discount rate	21.1 %	n/a

1 The disclosure for the fiscal year 2014/15 is not applicable due to the new reporting structure.

#### Sensitivity analyses with the impact of changes to the value in use of the CGU ETC-EMEA

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	68,574	-51,128
Revenue growth	±10 %	-4,649	30,207
EBITDA margin	±10 %	-6,919	6,919
Long-term growth rate	±0,5 %	-37,780	47,577

### 13.3 Cash-generating unit “Electronic Toll Collection, Asia and Pacific” (CGU ETC-APAC)

#### Key assumptions for determining expected cash flows of the CGU ETC-APAC

Management has based its determination on the assumption that after the successful implementation of road toll collection systems in APAC, especially in Australia, demand for toll systems will remain stable. The planning for the CGU ETC-APAC is based on implemented construction projects and current operation projects and their expansion as well as on the fact, that in Australia and New Zealand invitations to tender are in preparation or already in progress. Furthermore the delivery of components makes a substantial contribution to revenue.

#### Parameter CGU ETC-APAC

	2015/16	2014/15 <sup>1</sup>
Carrying amount of goodwill allocated to the CGU	7,378	n/a
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	n/a
Value in use of the CGU	146,052	n/a
Carrying amount	16,205	n/a
Discount rate before tax	7.8 %	n/a
Break-Even discount rate	99.6 %	n/a

1 The disclosure for the fiscal year 2014/15 is not applicable due to the new reporting structure.

#### Sensitivity analyses with the impact of changes to the value in use of the CGU ETC-APAC

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	23,172	-17,288
Revenue growth	±10 %	4,730	11,580
EBITDA margin	±10 %	-2,102	2,102
Long-term growth rate	±0,5 %	-12,558	15,815

### 13.4 Cash-generating unit “Intelligent Mobility Solutions, Americas” (CGU IMS-Americas)

#### Key assumptions for determining expected cash flows of the CGU IMS-Americas

Management has based its determination on the assumption that after the successful implementation of intelligent mobility solutions in North America, demand for intelligent mobility solutions will continue to rise. Furthermore it is expected that the technical maintenance and commercial operation will be performed by Kapsch TrafficCom. The planning for the CGU IMS-Americas is based especially on road safety and traffic monitoring systems.

#### Parameter CGU IMS-Americas

	2015/16	2014/15 <sup>1</sup>
Carrying amount of goodwill allocated to the CGU	3,349	n/a
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	n/a
Value in use of the CGU	79,389	n/a
Carrying amount	18,745	n/a
Discount rate before tax	7.5 %	n/a
Break-Even discount rate	18.4 %	n/a

<sup>1</sup> The disclosure for the fiscal year 2014/15 is not applicable due to the new reporting structure.

#### Sensitivity analyses with the impact of changes to the value in use of the CGU IMS-Americas

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	15,560	-11,585
Revenue growth	±10 %	-3,603	5,008
EBITDA margin	±10 %	-785	785
Long-term growth rate	±0,5 %	-8,570	10,792

### 13.5 Cash-generating unit “Intelligent Mobility Solutions, Europe, Middle East and Africa” (CGU IMS-EMEA)

#### Key assumptions for determining expected cash flows of the CGU IMS-EMEA

Management has based its determination on the assumption that after the successful implementation of intelligent mobility solutions in South Africa, the Netherlands, Great Britain, Italy and the Czech Republic, demand for intelligent mobility solutions will continue to rise. Furthermore it is expected that the technical maintenance and commercial operation will be performed by Kapsch TrafficCom. The planning for the CGU IMS-EMEA is based especially on road safety and traffic monitoring systems.

#### Parameter CGU IMS-EMEA

	2015/16	2014/15 <sup>1</sup>
Carrying amount of goodwill allocated to the CGU	2,708	n/a
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	n/a
Value in use of the CGU	64,186	n/a
Carrying amount	2,885	n/a
Discount rate before tax	7.7 %	n/a
Break-Even discount rate	482.2 %	n/a

<sup>1</sup> The disclosure for the fiscal year 2014/15 is not applicable due to the new reporting structure.

### Sensitivity analyses with the impact of changes to the value in use of the CGU IMS-EMEA

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	10,074	-7,506
Revenue growth	±10 %	1,807	3,953
EBITDA margin	±10 %	-1,179	1,179
Long-term growth rate	±0,5 %	-5,540	6,977

### 13.6 Cash-generating unit “Intelligent Mobility Solutions, Asia and Pacific” (CGU IMS-APAC)

#### Key assumptions for determining expected cash flows of the CGU IMS-APAC

Management has based its determination on the assumption that after the successful implementation of intelligent mobility solutions in Australia and New Zealand, demand for intelligent mobility solutions will continue to rise. Furthermore it is expected that the technical maintenance and commercial operation will be performed by Kapsch TrafficCom. The planning for the CGU IMS-APAC is based especially on road safety and traffic monitoring systems.

#### Parameter CGU IMS-APAC

	2015/16	2014/15 <sup>1</sup>
Carrying amount of goodwill allocated to the CGU	230	n/a
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	n/a
Value in use of the CGU	5,441	n/a
Carrying amount	2,300	n/a
Discount rate before tax	15.7 %	n/a
Break-Even discount rate	136.6 %	n/a

<sup>1</sup> The disclosure for the fiscal year 2014/15 is not applicable due to the new reporting structure.

### Sensitivity analyses with the impact of changes to the value in use of the CGU IMS-APAC

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	78	-70
Revenue growth	±10 %	-2,143	1,968
EBITDA margin	±10 %	-267	267
Long-term growth rate	±0,5 %	-15	19

### 13.7 Capitalized development costs

Development costs relate to expenses which in accordance with IAS 38 are capitalized and amortized over 3 to 5 years once the assets are available for commercial use.

Additional research and development costs of the group in the fiscal year 2015/16 amounted to EUR 56.6 million (2014/15: EUR 49.0 million). In the fiscal year 2015/16, EUR 32.4 million thereof (2014/15: EUR 22.0 million) related to project-specific development costs charged to the customer. The remaining amount of EUR 24.2 million (2014/15: EUR 27.0 million) was recognized as an expense.

## 14 Interests in associates.

Interests in associates developed as follows:

	2015/16	2014/15
<b>Carrying amount as of 31 March of prior year</b>	<b>2,014</b>	<b>1,596</b>
Currency translation differences	-138	184
Addition from foundation and acquisition	0	0
Disposal	0	0
Share in result	41	234
<b>Carrying amount as of 31 March of fiscal year</b>	<b>1,917</b>	<b>2,014</b>

On 3 December 2015, together with a partner, the group founded the Russian company LLC National operator of telematics services and holds an interest of 49%. The company is classified as an associated company. Therefore the investment is accounted for using the equity method. As of 31 March 2016 the book value of the interest amounting to TEUR 0 (31 March 2015: TEUR n/a).

The financial data of the entity as of the latest balance sheet date (31 March) are as follows:

	31 March 2016	31 March 2015
Non-current assets	12	n/a
Current assets	9	n/a
Non-current liabilities	0	n/a
Current liabilities	-68	n/a
<b>Net assets</b>	<b>-47</b>	<b>n/a</b>
Revenue	0	n/a
Result for the period	-51	n/a
Other comprehensive income for the period	0	n/a
<b>Total comprehensive income for the period</b>	<b>-51</b>	<b>n/a</b>

On 31 July 2012 the group acquired 33% of the shares in SIMEX, Integración de Sistemas, S.A.P.I. de C.V., Mexico. Taking potential voting rights into account (options for purchase of the remaining shares) the group has the majority of the shares. As the potential voting rights are not assessed to be substantial the presumption of control was rebutted. As significant influence over the financial and business policies exists, the investment is accounted for using the equity method.

The financial data of the entity as of the latest balance sheet date (31 December) are as follows:

	31 Dec. 2016	31 Dec. 2015
Non-current assets	1,474	1,340
Current assets	10,584	10,235
Non-current liabilities	-635	-620
Current liabilities	-6,471	-6,181
<b>Net assets</b>	<b>4,953</b>	<b>4,774</b>
Revenue	13,066	14,816
Result for the period	470	527
Other comprehensive income for the period	0	0
<b>Total comprehensive income for the period</b>	<b>470</b>	<b>527</b>

## 15 Current and non-current financial assets.

	2015/16	2014/15
Other non-current financial assets and investments	18,651	23,099
Other current financial assets	97	5,291
	<b>18,748</b>	<b>28,390</b>

	Available- for-sale securities	Available- for-sale investments	Other non-current financial assets	Total
<b>Other non-current financial assets and investments</b>				
<b>Carrying amount as of 31 March 2014</b>	<b>3,655</b>	<b>23,758</b>	<b>1,093</b>	<b>28,506</b>
Currency translation differences	0	0	98	98
Additions	0	362	0	362
Disposals	0	0	-1,190	-1,190
Change in fair value	148	-4,824	0	-4,676
<b>Carrying amount as of 31 March 2015</b>	<b>3,803</b>	<b>19,296</b>	<b>0</b>	<b>23,099</b>
Currency translation differences	0	0	1	1
Additions	0	101	98	199
Disposals	-40	0	0	-41
Change in fair value	-40	-4,567	0	-4,607
<b>Carrying amount as of 31 March 2016</b>	<b>3,723</b>	<b>14,829</b>	<b>99</b>	<b>18,651</b>

	Available- for-sale securities	Other	Total
<b>Other current financial assets</b>			
<b>Carrying amount as of 31 March 2014</b>	<b>4,924</b>	<b>0</b>	<b>4,924</b>
Additions	0	0	0
Disposals	0	0	0
Change in fair value	367	0	367
<b>Carrying amount as of 31 March 2015</b>	<b>5,291</b>	<b>0</b>	<b>5,291</b>
Currency translation differences	0	-9	-9
Additions	0	106	106
Disposals	-5,291	0	-5,291
Change in fair value	0	0	0
<b>Carrying amount as of 31 March 2016</b>	<b>0</b>	<b>97</b>	<b>97</b>

As of 31 March 2016, available-for-sale securities relate to government and bank bonds as well as shares in investment funds. As of 31 March 2016, investments classified as available-for-sale mainly relate to a 19.26 % investment in the listed company Q-Free ASA, Trondheim, Norway.

Unrealized gains and losses are recognized in other comprehensive income of the period (see Note 10).

### Fair value-hierarchies and determination of fair value:

Financial assets and liabilities have to be classified in one of the three following fair value-hierarchies:

**Level 1:** There are quoted prices in active markets for identical assets and liabilities. In the group, the investment in Q-Free ASA, Trondheim, Norway, as well as listed equity instruments are attributed to Level 1.

**Level 2:** The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques based on observable direct or indirect market data. This category comprises available-for-sale securities, such as mortgage bonds and government bonds, which are quoted, however not regularly traded on a stock market.

Specific valuation techniques used to value financial instruments include:

- ▶ quoted market prices or dealer quotes for similar instruments;
- ▶ the fair value of interest rate swaps is calculated as the present value of the estimated future cash flows based on observable yield curves;
- ▶ the fair value of forward foreign exchange contracts is determined using forward exchange rates at the balance sheet date, with the resulting value discounted back to present value;
- ▶ other techniques, such as discounted cash flow analysis, are used to determine fair value for the remaining financial instruments.

**Level 3:** Financial instruments are included in level 3 if the valuation information is not based on observable market data.

The classification of current and non-current financial assets is as follows:

	Level 1 Quoted prices	Level 2 Observable market data	Level 3 Not based on observable market data	2015/16
<b>Non-current financial assets</b>				
Available-for-sale securities	3,030	693	0	3,723
Available-for-sale investments	14,825	0	0	14,825
	<b>17,855</b>	<b>693</b>	<b>0</b>	<b>18,548</b>
<b>Current financial assets</b>				
Available-for-sale securities	0	0	0	0
	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>	<b>17,855</b>	<b>693</b>	<b>0</b>	<b>18,548</b>

In the fiscal year 2015/16, other non-current financial assets amounting to TEUR 99, other investments amounting to TEUR 4 as well as other current financial assets amounting to TEUR 97 were recognized at amortized cost.



	Level 1 Quoted prices	Level 2 Observable market data	Level 3 Not based on observable market data	2014/15
<b>Non-current financial assets</b>				
Available-for-sale securities	3,085	718	0	3,803
Available-for-sale investments	19,291	0	0	19,291
	<b>22,376</b>	<b>718</b>	<b>0</b>	<b>23,094</b>
<b>Current financial assets</b>				
Available-for-sale securities	5,291	0	0	5,291
	<b>5,291</b>	<b>0</b>	<b>0</b>	<b>5,291</b>
<b>Total</b>	<b>27,667</b>	<b>718</b>	<b>0</b>	<b>28,385</b>

In the fiscal year 2014/15, other non-current financial assets amounting to TEUR 5 are recognized at amortized cost.

## 16 Other non-current assets.

	2015/16	2014/15
Project in the Republic of Belarus	18,094	26,987
Truck toll collection system Czech Republic	711	1,148
Other	72	3
	<b>18,877</b>	<b>28,138</b>

Other non-current assets include amounts due from customers for contract work for the installation of the truck toll collection system in the Republic of Belarus as well as trade receivables (non-current) that are due from the Czech Ministry of Transport for the installation of the Czech truck toll collection system. As in the prior year, they fall due between 1 and 5 years as of the balance sheet date.

Non-current receivables were discounted on the basis of cash flows using an interest rate of 2.49 – 5.65 % (for that part which was funded by external loans) and an interest rate for alternative investments of 2.89 % (for that part which was funded by internal cash flows of the group). Thus, the fair values approximate the carrying amounts.

Gross cash flows of other non-current assets are as follows:

	2015/16	2014/15
Up to 2 years	19,891	29,706
Between 2 and 3 years	219	171
More than 3 years	62	0
	<b>20,172</b>	<b>29,877</b>

Amounts due from customers for contract work (non-current) are as follows:

	2015/16	2014/15
Construction costs incurred plus recognized gains	18,094	26,987
Less total amounts invoiced and advance payments received	0	0
	<b>18,094</b>	<b>26,987</b>

## 17 Inventories.

	2015/16	2014/15
Purchased parts and merchandise, at acquisition cost	26,268	25,925
Unfinished goods and work in progress, at production cost	6,551	14,680
Finished goods, at production cost	2,871	7,033
Prepayments on inventories	68	33
	<b>35,757</b>	<b>47,670</b>

Individual inventory items were written down, where necessary, to their net realizable values. The write-downs of inventories amount to TEUR 21,755 (2014/15: TEUR 21,171). In the reporting period TEUR 584 were recognized in the statement of comprehensive income (2014/15: TEUR 4,539).

## 18 Trade receivables and other current assets.

	2015/16	2014/15
Trade receivables	53,520	75,470
Allowance for bad debts	-2,095	-2,715
<b>Trade receivables – net</b>	<b>51,425</b>	<b>72,754</b>
Amounts due from customers for contract work	98,368	83,995
Amounts due from customers for service and maintenance contracts	15,247	8,502
Current tax receivables from income tax	3,754	3,336
Receivables from tax authorities (other than income tax)	10,489	12,994
Other receivables and prepaid expenses	20,629	23,805
	<b>199,912</b>	<b>205,387</b>

As of 31 March 2016 trade receivables with a net value of TEUR 2,238 (2014/15: TEUR 3,068) have been impaired. The corresponding impairment amounts to TEUR -2,095 (2014/15: TEUR -2,715).

Allowance for bad debt developed as follows:

	2015/16	2014/15
<b>Balance as of 31 March of the prior year</b>	<b>-2,715</b>	<b>-421</b>
Additions from the acquisition of companies	0	0
Addition	-70	-2,422
Utilization	261	73
Disposal	337	112
Currency translation differences	93	-58
<b>Balance as of 31 March of the reporting year</b>	<b>-2,095</b>	<b>-2,715</b>

Maturity structure of trade receivables and other current assets:

	2015/16	2014/15
Not yet due	21,954	52,350
Overdue:		
Less than 60 days (not impaired)	12,040	11,143
Less than 60 days (impaired)	0	0
More than 60 days (not impaired)	17,288	8,908
More than 60 days (impaired)	2,238	3,068
	<b>53,520</b>	<b>75,470</b>

Given the short maturities of these financial instruments, it is assumed that the fair values correspond to the carrying amounts. There is no concentration of credit risk with respect to trade receivables (except for the toll collection projects in the Czech Republic, South Africa, Poland and the Republic of Belarus), as the group generally has a large number of customers worldwide. Trade receivables (current) relating to the installation of the truck toll collection system of the Czech Republic amounting to TEUR 3,670 (2014/15: TEUR 2,481) and to the operation and maintenance of the system amounting to TEUR 20,474 (2014/15: TEUR 22,044) are due from Ředitelství silnic a dálnic ČR (RSD), a company of the Czech Republic. Trade receivables from the toll collection project in Poland due from GDDKiA (Generalna Dyrekcja Dróg Krajowych i Autostrad) amount to TEUR 4,890 (2014/15: TEUR 5,027). Trade receivables (current) relating to the installation of the truck toll collection system of the Republic of Belarus amounting to TEUR 39,042 (2014/15: TEUR 0) and to the operation of the system amounting to TEUR 3,317 (2014/15: TEUR 875) are due from BelToll.

Trade receivables amounting to TEUR 3,365 (2014/15: TEUR 4,989) were pledged as collateral to banks (see Note 21).

Amounts due from customers for contract work are as follows:

	2015/16	2014/15
Construction costs incurred plus recognized gains	471,098	439,282
Less amounts billed and prepayments received	-372,731	-355,287
	<b>98,368</b>	<b>83,995</b>

As of 31 March 2016, amounts due from customers for contract work primarily relate to toll collection projects in North America amounting to TEUR 23,592 (2014/15: TEUR 21,400), in France amounting to TEUR 422 (2014/15: TEUR 2,083) as well as the establishment of the toll collection system in the Republic of Belarus amounting to TEUR 64,174 (2014/15: TEUR 53,499).

Revenues from construction contracts amount to TEUR 115,263 (2014/15: TEUR 105,879).

## 19 Cash and cash equivalents.

	2015/16	2014/15
Cash on hand	90	62
Deposits held with banks	140,692	96,703
	<b>140,782</b>	<b>96,765</b>

The carrying amounts of this item also represent cash and cash equivalents at the end of the reporting period as presented in the cash flow statement.

## 20 Share capital.

	2015/16	2014/15
Carrying amount as of 31 March of fiscal year	13,000	13,000

The total number of shares issued is 13,000,000. The shares are ordinary bearer shares and have no par value.

## 21 Current and non-current financial liabilities.

	2015/16	2014/15
<b>Non-current</b>		
Corporate bond	70,513	74,485
Loans for project financing	0	14,500
Other non-current loans	15,221	0
	<b>85,734</b>	<b>88,985</b>
<b>Current</b>		
Loans for project financing	14,500	20,333
Other current loans	6,849	28,636
	<b>21,349</b>	<b>48,969</b>
<b>Total</b>	<b>107,083</b>	<b>137,954</b>

Movements are as follows:

	31 March 2014	Reclassification	Additions	Repayment	Currency translation differences	31 March 2015
Non-current financial assets	109,494	-20,693	184	0	0	88,985
Current financial assets	46,560	20,693	7,053	-30,220	4,883	48,969
<b>Total</b>	<b>156,054</b>	<b>0</b>	<b>7,237</b>	<b>-30,220</b>	<b>4,883</b>	<b>137,954</b>

	31 March 2015	Reclassification	Additions	Repayment	Currency translation differences	31 March 2016
Non-current financial assets	88,985	-3,220	471	0	-502	85,734
Current financial assets	48,969	3,220	2,830	-32,927	-742	21,349
<b>Total</b>	<b>137,954</b>	<b>0</b>	<b>3,301</b>	<b>-32,927</b>	<b>-1,245</b>	<b>107,083</b>

The corporate bond of Kapsch TrafficCom AG was successfully placed in November 2010 with a volume of EUR 75 million, a maturity of 7 years and an interest rate of 4.25 %. The effective interest rate amounts to 4.54 %.

In May 2015 debts with a nominal value of TEUR 4,182 of the corporate bond were reacquired prematurely. Therefore the corporate bond is outstanding with TEUR 70,818 with a maturity period until 3 November 2017.

The fair values and the gross cash flows of current and non-current financial liabilities are as follows:

	2015/16	2014/15
<b>Carrying amount</b>	<b>107,083</b>	<b>137,954</b>
<b>Fair value</b>	<b>113,768</b>	<b>151,226</b>
Gross cash flows:		
In the first half year of the next fiscal year	15,264	17,891
In the second half year of the next fiscal year	9,344	34,844
<b>Total up to 1 year</b>	<b>24,609</b>	<b>52,735</b>
Between 1 and 2 years	79,164	18,074
Between 2 and 3 years	3,677	78,382
Between 3 and 4 years	3,618	0
Between 4 and 5 years	3,558	0
More than 5 years	898	0
	<b>115,524</b>	<b>149,191</b>

The classification of financial liabilities is as follows:

	Level 1 Quoted prices	Level 2 Observable market data	Level 3 Not based on observable market data	2015/16
Corporate bond	73,297	0	0	73,297
Other financial liabilities	0	40,471	0	40,471
<b>Total</b>	<b>73,297</b>	<b>40,471</b>	<b>0</b>	<b>113,768</b>

	Level 1 Quoted prices	Level 2 Observable market data	Level 3 Not based on observable market data	2014/15
Corporate bond	78,338	0	0	78,338
Other financial liabilities	0	72,888	0	72,888
<b>Total</b>	<b>78,338</b>	<b>72,888</b>	<b>0</b>	<b>151,226</b>

The fair value of the other financial liabilities (level 2) was derived through discounting the gross cash flows over the contracted term at a risk-adjusted interest rate.

Interest rates on current and non-current financial liabilities are as follows:

	2015/16	2014/15
Total financial liabilities:		
Carrying fixed interest rates	72,364	78,537
Carrying variable interest rates	34,719	59,416
	<b>107,083</b>	<b>137,954</b>
Average interest rates:		
Loans for project financing	5.46 %	5.46 %
Corporate bond	4.54 %	4.54 %
Other loans	0.60–2.77 %	1.00–3.10 %

Trade receivables (current) amounting to TEUR 3,365 (2014/15: TEUR 4,989) were pledged as collateral for bank guarantees and loans.

For project financing of the Belorussian toll collection system, with an outstanding amount of TEUR 14,500 as of 31 March 2016 (2014/15: TEUR 34,833), Kapsch TrafficCom AG obtained a guarantee of a bill of exchange of the Oesterreichische Kontrollbank Aktiengesellschaft (OeKB) as well as a participation guarantee G4 of OeKB. The claims of the participation guarantee G4 have been assigned as security to the lending banks.

A bill of exchange amounting to TEUR 1,425 (2014/15: TEUR 1,425) was issued for an export promotion credit.

## 22 Deferred tax assets/liabilities.

	2015/16	2014/15
<b>Deferred tax assets</b>		
Deferred tax assets to be recovered after more than 12 months	9,251	9,274
Deferred tax assets to be recovered within 12 months	2,644	4,317
	<b>11,895</b>	<b>13,590</b>
<b>Deferred tax liabilities</b>		
Deferred tax liabilities to be recovered after more than 12 months	789	1,052
Deferred tax liabilities to be recovered within 12 months	2,401	1,328
	<b>3,190</b>	<b>2,380</b>
<b>Deferred tax assets net (+) / deferred tax liabilities net (-)</b>	<b>8,705</b>	<b>11,210</b>

Deferred taxes due to tax loss carry-forwards and other temporary differences deductible in the future are recognized only to the extent of their potential realization. In these consolidated financial statements, tax loss carry-forwards amounting to TEUR 37,983 (2014/15: TEUR 28,996) have not been recognized because it was uncertain whether there would be sufficient taxable profits available against which to offset them. These tax loss carry-forwards origin from foreign subsidiaries with the predominant part not expiring before 2030. All other deferred tax assets have been recognized in the respective group companies as future deductible items.

Deferred income tax assets and liabilities are offset, taking maturities into account, when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income taxes assets and liabilities relate to income taxes levied by the same taxation authority on the same taxable entity.

Deferred tax assets/liabilities are attributable to the following positions:

	31 March 2014	Taken through the profit of the period	Taken through other comprehensive income	Currency translation differences	Re- classification	31 March 2015
<b>Deferred tax assets</b>						
Tax loss carry-forwards	7,623	204	0	184	0	8,010
Provisions disallowed for tax purposes	6,976	-2,907	646	38	0	4,753
Depreciation disallowed for tax purposes	1,163	-123	0	10	0	1,049
Construction contracts	804	1,211	0	0	0	2,014
Other	5,103	1,538	-2,298	113	0	4,456
	<b>21,669</b>	<b>-77</b>	<b>-1,653</b>	<b>345</b>	<b>0</b>	<b>20,283</b>
<b>Deferred tax liabilities</b>						
Special depreciation/amortization of non-current assets	572	213	0	72	0	857
Gains from recognition at fair value	7,818	-2,508	0	0	0	5,310
Other	1,946	833	92	34	0	2,905
	<b>10,337</b>	<b>-1,462</b>	<b>92</b>	<b>106</b>	<b>0</b>	<b>9,073</b>
<b>Total change</b>	<b>11,332</b>	<b>1,385</b>	<b>-1,744</b>	<b>238</b>	<b>0</b>	<b>11,210</b>

	31 March 2015	Taken through the profit of the period	Taken through other comprehensive income	Currency translation differences	Re- classification	31 March 2016
<b>Deferred tax assets</b>						
Tax loss carry-forwards	8,010	13	0	-880	0	7,143
Provisions disallowed for tax purposes	4,753	221	93	-92	24	4,998
Depreciation disallowed for tax purposes	1,049	-168	0	-7	0	875
Construction contracts	2,014	0	0	0	-2,014	0
Other	4,456	-4	584	-226	-614	4,195
	<b>20,283</b>	<b>62</b>	<b>676</b>	<b>-1,205</b>	<b>-2,605</b>	<b>17,212</b>
<b>Deferred tax liabilities</b>						
Special depreciation/amortization of non-current assets	857	-47	0	-57	0	753
Contract work	0	3,772	0	0	-2,014	1,758
Gains from recognition at fair value	5,310	-1,949	0	0	0	3,361
Other	2,905	1,197	-839	-38	-590	2,635
	<b>9,073</b>	<b>2,973</b>	<b>-839</b>	<b>-95</b>	<b>-2,605</b>	<b>8,507</b>
<b>Total change</b>	<b>11,210</b>	<b>-2,911</b>	<b>1,515</b>	<b>-1,110</b>	<b>0</b>	<b>8,705</b>

## 23 Liabilities from post-employment benefits to employees.

Amounts recognized in the balance sheet:

	2015/16	2014/15
Termination benefits	9,505	9,690
Pension benefits	14,603	15,520
	<b>24,107</b>	<b>25,210</b>

### Termination benefits

Termination benefits include legal and contractual entitlements to one-off payments to employees of the group which result from events such as dismissal by the employer, amicable termination of the employment, retirement or death of the employee. For termination benefits the group bears the risk of inflation due to compensation increases. The obligations from termination benefits mainly result from the Austrian entities of the group.

### Retirement benefits

Liabilities for retirement benefits recognized at the balance sheet date relate to retirees only. All pension agreements are based on the final salary, are granted as fixed monthly pension payments and are not covered by external plan assets (funds). In addition, contributions are paid to an external pension fund for employees of the group (see Note 5). For retirement benefits the group bears the risk of longevity and inflation due to pension increases.

Termination benefits obligations were valued based on an interest rate of 1.30 % – 1.75 % (2014/15: 2.10 %), pension benefit obligations were valued based on an interest rate of 1.85 % (2014/15: 1.80 %) for the euro area and based on an interest rate of 4.30 % (2014/15: 3.75 %) for Canada and compensation increases based on a rate of 2.5 % (2014/15: 2.0 %). In addition, the calculation was based on the earliest possible statutory retirement age including transition provisions and using the mortality tables AVÖ 2008-P (2014/15: AVÖ 2008-P) by Pagler & Pagler. Pension increases were estimated at 0.89 % (2014/15: 1.7 %).

The following amounts are recognized in the statement of comprehensive income as expenses for termination benefits:

	2015/16	2014/15
<b>Change in liabilities recognized in the balance sheet:</b>		
<b>Carrying amount as of 31 March of prior year</b>	<b>9,690</b>	<b>8,790</b>
Remeasurements (actuarial gains/losses)	416	836
Current service cost	259	281
Interest expense	197	306
Payments	-1,038	-543
Currency translation differences	-18	19
<b>Carrying amount as of 31 March of fiscal year</b>	<b>9,505</b>	<b>9,690</b>
Total, included in the staff costs (Note 5)	259	281
Total, included in the financial result (Note 8)	197	306



Remeasurements are attributable to the following positions:

	2015/16	2014/15
Remeasurements from changes in demographic assumptions	-73	-158
Remeasurements from changes in financial assumptions	690	1,046
Remeasurements from other changes (experience adjustments)	-200	-53
<b>Total</b>	<b>416</b>	<b>836</b>

The expected allocation for termination benefits for the next fiscal year 2016/2017 amounts to TEUR 324. The weighted average duration amounts to 8.2 years.

#### Analysis of expected maturity of undiscounted benefits

	2016/17	2017/18	2018/19	2019/20	2020/21	over 5 years	Total
Termination benefits	623	646	624	617	846	8,206	11,562

In the following sensitivity analysis for termination benefit obligations, the impacts resulting from changes in significant actuarial assumptions were changed, whereas the other impact quantities were kept constant. However, in reality it will be rather likely that several of these impact quantities will change.

	Changes in assumption	Decrease in assumption	Increase in assumption
<b>Impact of changes in the discount rate</b>			
Defined benefit obligation (DBO)	± 0.5 BP	388	-363
Expected annual interest expenses (IC)	± 0.5 BP	-42	38
Expected annual service costs (CSC)	± 0.5 BP	10	-9
<b>Impact of changes in salary increases</b>			
Defined benefit obligation (DBO)	± 0.5 BP	-341	360
Expected annual interest expenses (IC)	± 0.5 BP	-5	6
Expected annual service costs (CSC)	± 0.5 BP	-10	11
<b>Impact of changes in fluctuation</b>			
Defined benefit obligation (DBO)	± 5 %	29	-28
Expected annual interest expenses (IC)	± 5 %	0	0
Expected annual service costs (CSC)	± 5 %	1	-1

The following amounts are recognized in the statement of comprehensive income as expenses for **retirement benefits**:

	2015/16	2014/15
<b>Change in liabilities recognized in the balance sheet:</b>		
<b>Carrying amount as of 31 March of prior year</b>	<b>15,520</b>	<b>13,363</b>
Remeasurements (actuarial gains/losses)	-185	2,328
Current service cost	7	11
Interest expense	312	452
Payments	-876	-862
Currency translation differences	-176	230
<b>Carrying amount as of 31 March of fiscal year</b>	<b>14,603</b>	<b>15,520</b>
Total, included in the staff costs (Note 5)	7	11
Total, included in the financial result (Note 8)	312	452

Remeasurements are attributable to the following positions:

	2015/16	2014/15
Remeasurements from changes in demographic assumptions	0	0
Remeasurements from changes in financial assumptions	-208	1,984
Remeasurements from other changes (experience adjustments)	23	344
<b>Total</b>	<b>-185</b>	<b>2,328</b>

The expected allocation for retirement benefits for the next fiscal year 2016/2017 amounts to TEUR 320. The weighted average duration amounts to 10.2 years.

#### Analysis of expected maturity of undiscounted benefits

	2016/17	2017/18	2018/19	2019/20	2020/21	over 5 years	Total
Retirement benefits	888	859	858	855	851	13,775	18,087

In the following sensitivity analysis for pension obligations, the impacts resulting from changes in significant actuarial assumptions were changed, whereas the other impact quantities were kept constant. However, in reality it will be rather likely that several of these impact quantities will change.

	Changes in assumption	Decrease in assumption	Increase in assumption
<b>Impact of changes in the discount rate</b>			
Defined benefit obligation (DBO)	± 0.5 BP	641	-591
Expected annual interest expenses (IC)	± 0.5 BP	-53	48
<b>Impact of changes in pension increases</b>			
Defined benefit obligation (DBO)	± 0.5 BP	-592	635
Expected annual interest expenses (IC)	± 0.5 BP	-11	12

## 24 Other non-current liabilities.

	2015/16	2014/15
Liabilities of acquisition of shares	2,077	2,036
Truck toll collection system Czech Republic	229	568
Other	1,027	2,053
	<b>3,333</b>	<b>4,657</b>

Liabilities of acquisition of shares relate to a variable purchase price component (earn-out payment) from the acquisition of shares in Kapsch Telematic Services GmbH, Vienna, amounting to TEUR 2,077 (2014/15: TEUR 2,036), see note 31.

Other non-current liabilities relate to trade payables (non-current) amounting to TEUR 229 (2014/15: TEUR 568) due to subcontractors for the installation of the Czech truck toll collection system. As in the prior year, these liabilities are due in more than 1 year and less than 5 years as of the balance sheet date. These non-current liabilities were discounted on the basis of cash flows using discount rates that correspond to those rates applied in discounting non-current receivables from the Czech truck toll collection system (see Note 16). Thus, the fair values approximate the carrying amounts.

Other non-current liabilities mainly relate to loans from minority shareholders of TMT Services and Supplies (Pty) Ltd., Capetown, South Africa amounting to TEUR 35 (2014/15: TEUR 1,483), to the non-current portion of a contingent payment obligation amounting to TEUR 272 (2014/15: TEUR 288) from the acquisition of the "Mobility Solutions" business of TechnoCom Corporation, Encino, U.S.A., as well as rental payments for American subsidiaries amounting to TEUR 576 (2014/2015: TEUR 0).

The gross cash flows of other non-current liabilities are as follows:

	2015/16	2014/15
Less than 2 year	573	1,080
Between 2 and 3 years	2,341	2,181
More than 3 years	654	1,704
	<b>3,568</b>	<b>4,966</b>

## 25 Other liabilities and deferred income.

	2015/16	2014/15
Amounts due to customers for contract work	20,340	17,786
Prepayments received	508	349
Current portion of other non-current liabilities	8	162
Current liabilities from derivatives and hedging activities	0	47
Current employee liabilities	22,274	18,984
Liabilities to tax authorities (other than income tax)	5,234	5,241
Liabilities from tax compensation to the tax group leader	4,421	4,298
Other liabilities and deferred income	26,557	18,668
	<b>79,342</b>	<b>65,535</b>

Amounts due to customers for contract work detail as follows:

	2015/16	2014/15
Construction costs incurred plus recognized gains	-136,723	-76,019
Less amounts billed and prepayments received	157,063	93,805
	<b>20,340</b>	<b>17,786</b>

As of 31 March 2016, amounts due to customers for contract work mainly relate to toll collection projects in North America (2014/15: toll collection projects in North America).

## 26 Provisions.

	2015/16	2014/15
Non-current provisions	1,396	1,661
Current provisions	8,946	9,225
<b>Total</b>	<b>10,341</b>	<b>10,886</b>

The provisions changed as follows:

	31 March 2014	Additions from the acquisition of companies	Addition from interest expenses	Addition	Utilization	Disposal	Reclassi- fication	Currency translation differences	31 March 2015
Obligations from anniversary									
bonuses	1,120	0	38	34	0	-2	0	0	1,189
Other	183	0	5	272	-52	0	0	64	472
<b>Non-current provisions, total</b>	<b>1,303</b>	<b>0</b>	<b>43</b>	<b>306</b>	<b>-52</b>	<b>-2</b>	<b>0</b>	<b>64</b>	<b>1,661</b>
Warranties	1,637	0	0	209	-18	-245	0	28	1,611
Losses from pending									
transactions and rework	16,201	0	0	0	-3	-16,162	0	-36	1
Legal fees, costs of litigation									
and contract risks	4,071	0	0	220	-2,682	-1,198	0	-9	402
Other	6,468	0	0	5,148	-4,337	-396	0	328	7,211
<b>Current provisions, total</b>	<b>28,378</b>	<b>0</b>	<b>0</b>	<b>5,577</b>	<b>-7,039</b>	<b>-18,001</b>	<b>0</b>	<b>311</b>	<b>9,225</b>
<b>Total</b>	<b>29,680</b>	<b>0</b>	<b>43</b>	<b>5,882</b>	<b>-7,091</b>	<b>-18,004</b>	<b>0</b>	<b>375</b>	<b>10,886</b>
	31 March 2015	Additions from the acquisition of companies	Addition from interest expenses	Addition	Utilization	Disposal	Reclassi- fication	Currency translation differences	31 March 2016
Obligations from anniversary									
bonuses	1,189	0	23	7	0	-33	0	0	1,186
Other	472	0	4	215	-5	-340	0	-137	210
<b>Non-current provisions, total</b>	<b>1,661</b>	<b>0</b>	<b>28</b>	<b>221</b>	<b>-5</b>	<b>-373</b>	<b>0</b>	<b>-137</b>	<b>1,396</b>
Warranties	1,611	711	0	218	-1	-359	0	-68	2,113
Losses from pending									
transactions and rework	1	0	0	0	0	-1	0	0	0
Projects (excl. impending									
losses)	0	0	0	0	-4	0	3,216	-17	3,196
Legal fees, costs of litigation									
and contract risks	402	0	0	6,572	-3,337	-184	0	-103	3,349
Costs of dismantling, removing									
and restoring assets	0	183	0	0	0	-15	0	-12	156
Other	7,211	0	0	2,041	-4,100	-1,699	-3,216	-105	132
<b>Current provisions, total</b>	<b>9,225</b>	<b>894</b>	<b>0</b>	<b>8,831</b>	<b>-7,442</b>	<b>-2,258</b>	<b>0</b>	<b>-305</b>	<b>8,946</b>
<b>Total</b>	<b>10,886</b>	<b>894</b>	<b>28</b>	<b>9,052</b>	<b>-7,447</b>	<b>-2,631</b>	<b>0</b>	<b>-441</b>	<b>10,341</b>

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The **provision for anniversary bonuses** relates to non-current entitlements of employees based on Collective Agreements. The valuation was based on an interest rate of 1.15 % – 1.75 % (2014/15: 2.10 %), the earliest possible statutory retirement age including transition provisions and using the mortality tables AVÖ 2008-P (2014/15: AVÖ 2008-P) by Pagler & Pagler, increases in salary were considered at 2.5 % (2014/15: 2.0 %).

As manufacturer, dealer and service provider, the group issues **product warranties** at the time of sale to its customers. Usually, under the terms of the warranty contract, the group has the obligation to repair or replace manufacturing or software defects that become apparent within the period under guarantee. When the group expects warranty claims on products sold or services rendered during the period under guarantee, a corresponding provision is set up in the financial statements. Based on the expectation that the majority of the expenditure will be incurred in the short or medium term, the best estimate for the cost of warranty is used for the recognition of the provision. Likewise, historical data is taken into account in the calculation of the provision amount. According to past experience, it is probable that there will be claims under the warranties.

The provision for **losses from pending transactions and rework** was set up for expected losses from not yet completed construction contracts at the balance sheet date. Due to a change in circumstances as of 30 September 2014 a provision for losses from pending transactions and rework in the amount of TEUR 16,162 had to be reversed in the second quarter of fiscal year 2014/15. The management considers the risk of incurring the pending loss as remote.

The provisions for **projects (excl. impending losses)** mainly regard to maintenance-, extension- and repair-services for current toll projects.

Provisions for **legal fees, costs of litigation and contract risks** mainly regard to current case laws and consulting costs related to acquisitions.

Costs of **dismantling, removing and restoring assets** mainly relate to a provision for dismantling sensors in the area of mobility solutions for cities after expiry of the contract of an American subsidiary.

**Other provisions** mainly include provisions for commissions and bonuses, rebate in kind, outstanding credit notes and project costs as well as discounts granted to customers.

## 27 Contingent liabilities, other commitments and operating lease commitments.

The group's contingent liabilities primarily result from large-scale projects. Other commitments mainly relate to contract and warranty bonds, bank guarantees, performance and bid bonds as well as sureties.

Contingent liabilities and other commitments only include commitments to third-parties and are as follows:

	2015/16	2014/15
<b>Contract, warranty, performance and bid bonds</b>		
South Africa (Toll collection systems)	47,029	45,697
Australia (Toll collection systems)	20,832	17,804
Other	241	1,246
<b>Total</b>	<b>68,102</b>	<b>64,747</b>

Operating activities require the disclosure of contract, warranty, performance and bid bonds for major projects, which are issued by financial institutes and insurance companies. In case the contractual obligations cannot be fulfilled, there is a risk of utilization, that can result in a recourse claim of the financial institute or insurance company against the group. Such an outflow of resources is expected as unlikely. This kind of contract, warranty, performance and bid bonds in the amount of TEUR 178,598 (previous year: TEUR 130,282) are not included in the contingent liabilities respectively in the financial statements.

For details of securities for above-mentioned contingent liabilities and other commitments, see Note 15 and Note 21. Furthermore, assets of Kapsch TrafficCom AB, Jönköping, Sweden, amounting to TEUR 9,756 (2014/15: TEUR 9,688) were pledged in favor of a Swedish bank in order to secure contingent liabilities.

### Financial obligations from lease contracts:

The future payments from non-cancelable obligations from rental and operating lease contracts are presented below:

	2015/16	2014/15
Up to 1 year	14,474	13,519
Between 1 and 5 years	25,999	31,656
Over 5 years	12,069	15,894
	<b>52,543</b>	<b>61,069</b>

### Rental and lease payments recognized as expenses in the reporting period:

Payments from operating leases recognized as expenses of the reporting period are as follows:

	2015/16	2014/15
Rent	10,365	10,833
Motor vehicle leases	1,461	1,621
IT leases	2,736	3,494
Other	640	532
	<b>15,202</b>	<b>16,481</b>

## 28 Business Combinations.

On 14 April 2015 the group acquired a controlling interest in the Californian Streetline, Inc. Streetline is a leading smart parking company that offers intelligent data and modern analytics to solve parking space problems for end users. Afterwards the entity was merged into KTC SL Merger Corp. and since then trades under the name Streetline, Inc.

Consideration paid	189
Less fair value of net assets acquired	-189
<b>Goodwill</b>	<b>0</b>

Assets and liabilities resulting from the acquisition are shown as follows:

	Fair value
Property, plant and equipment	1,251
Intangible assets	46
Receivables and other assets	580
Cash and cash equivalents	2,732
Liabilities, other liabilities and deferred income	-4,399
<b>Net assets acquired</b>	<b>210</b>
thereof controlling interests (90%)	189
thereof non-controlling interests (10%)	21

The acquired company contributed revenue of TEUR 2,506 and a net loss of TEUR -3,038 to the group's result for the period from 14 April 2015 to 31 March 2016. If the acquisition had occurred on 1 April 2015, there would have been no material impact on the group's revenues or net income.

## 29 Interests in subsidiaries.

Entity, Headquarter of Entity	Internal designation	31 March 2016		31 March 2015	
		Group's share	Non-controlling interests	Group's share	Non-controlling interests
Kapsch TrafficCom AG, Vienna	KTC	100.00%	0.0%	100.0%	0.0%
Kapsch TrafficCom Construction & Realization spol. s r.o., Prague, Czech Republic	KTC C&R CZ	99.0%	1.0%	99.0%	1.0%
Kapsch TrafficCom Ltd., Manchester, United Kingdom	KTC UK	100.00%	0.0%	100.0%	0.0%
Kapsch Components GmbH & Co KG, Vienna	KCO	100.00%	0.0%	100.0%	0.0%
Kapsch Components GmbH, Vienna	KCO GmbH	100.00%	0.0%	100.0%	0.0%
ArtiBrain Software Entwicklungsgesellschaft mbH, Vienna	ArtiBrain	100.00%	0.0%	100.0%	0.0%
Kapsch TrafficCom S.r.l. a socio unico, Milan, Italy	KTC Italy	100.00%	0.0%	100.0%	0.0%
Kapsch TrafficCom d.o.o., Ljubljana, Slovenia	KTC Slovenia	100.00%	0.0%	100.0%	0.0%
Transport Telematic Systems – LLC, Abu Dhabi, United Arab Emirates <sup>4</sup>	TTS, UAE	49.0%	51.0%	49.0%	51.0%
Kapsch TrafficCom Russia, OOO, Moscow, Russia	KTC Russia	100.00%	0.0%	100.0%	0.0%
Kapsch Telematik Technologies Bulgaria EAD, Sofia, Bulgaria	KTTB, Bulgaria	100.00%	0.0%	100.0%	0.0%
Kapsch TrafficCom Argentina S.A., Buenos Aires, Argentina	KTC Argentina	100.00%	0.0%	100.0%	0.0%
Kapsch TrafficCom Kazakhstan LLC, Almaty, Kazakhstan	KTC Kazakhstan	100.00%	0.0%	100.0%	0.0%

Entity, Headquarter of Entity	Internal designation	31 March 2016		31 March 2015	
		Group's share	Non-controlling interests	Group's share	Non-controlling interests
Kapsch Telematic Services IOOO, Minsk, Belarus	KTS Belarus	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom KGZ OOO, Bishkek, Kyrgyzstan	KTC Kyrgyzstan	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Lietuva UAB, Vilnius, Lithuania	KTC Lithuania	51.0 %	49.0 %	51.0 %	49.0 %
KTS Beteiligungs GmbH, Vienna	KTS Beteiligung	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom AB, Jonkoping, Sweden	KTC Sweden	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom do Brasil LTDA., Sao Paulo, Brazil	KTC Brazil	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Australia Pty Ltd, Melbourne, Australia	KTC Australia	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Chile S.A., Santiago de Chile, Chile	KTC Chile	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom France SAS, Paris, France	KTC France	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom PTE. LTD., Tripleone Somerset, Singapore	KTC Singapore	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom (M) Sdn Bhd, Kuala Lumpur, Malaysia	KTC Malaysia	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Limited, Auckland, New Zealand	KTC New Zealand	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom South Africa (Pty) Ltd., Johannesburg, South Africa	KTC SA	100.00 %	0.0 %	100.0 %	0.0 %
Electronic Toll Collection (PTY) Ltd., Centurion, South Africa	ETC	100.00 %	0.0 %	87.0 %	13.0 %
Kapsch TrafficCom South Africa Holding (Pty) Ltd., Cape Town, South Africa	KTC SA Holding	100.00 %	0.0 %	100.0 %	0.0 %
TMT Services and Supplies (Pty) Ltd., Cape Town, South Africa	TMT	100.00 %	0.0 %	62.9 %	37.1 %
Mobiserve (Pty) Ltd., Cape Town, South Africa,	Mobiserve	100.00 %	0.0 %	62.9 %	37.1 %
Berrydust 51 (Pty) Ltd., Cape Town, South Africa	Berrydust	100.00 %	0.0 %	53.5 %	46.5 %
Kapsch TrafficCom B.V., Amsterdam, Netherlands	KTC BV	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Canada Inc., Mississauga, Canada	KTC Canada	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom IVHS, S.A. de C.V., Mexico City, Mexico	KTC IVHS Mexico	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Holding II US Corp., McLean, U.S.A.	KTC Hold. II US Corp.	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom IVHS Inc., McLean, U.S.A.	KTC IVHS Inc., USA	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom USA Inc., Duluth, U.S.A.	KTC USA, Inc.	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Holding Corp., McLean, U.S.A.	KTC Holding Corp., USA	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Inc., McLean, U.S.A.	KTC Inc., USA	100.00 %	0.0 %	100.0 %	0.0 %
KTCSL Merger Corp., Delaware, U.S.A. <sup>3</sup>	KTCSL	—	—	100,0 %	0,0 %
Streetline Inc., Foster City, U.S.A. <sup>1</sup>	Streetline	81.2 %	18.8 %	—	—
Streetline International, Inc., Delaware, U.S.A. <sup>1</sup>	Streetline international	81.2 %	18.8 %	—	—
SPS funding Co. LLC, Delaware, U.S.A. <sup>1</sup>	SPS Funding	81.2 %	18.8 %	—	—
Kapsch Telematic Services GmbH, Vienna	KTS Austria	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch Telematic Services Kft. "v.a.", Budapest, Hungary <sup>2</sup>	KTS Hungary	—	—	100.0 %	0.0 %
Kapsch Telematic Services spol. s r.o., Prague, Czech Republic	KTS CZ	52.0 %	48.0 %	52.0 %	48.0 %
Kapsch Telematic Services GmbH Deutschland, Berlin, Germany	KTS Germany	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch Telematic Services Solutions A/S under tvangsoplosning, Copenhagen, Denmark <sup>5</sup>	KTSS Denmark	60.0 %	40.0 %	60.0 %	40.0 %
Kapsch Telematic Services Sp. z o.o., Warsaw, Poland	KTS Poland	100.00 %	0.0 %	100.0 %	0.0 %
Kapsch Road Services Sp. z o.o., Warsaw, Poland	KRS Poland	100.00 %	0.0 %	100.0 %	0.0 %

1 Foundation/acquisition in fiscal year 2015/16

2 Deconsolidation in fiscal year 2015/16

3 Merger in fiscal year 2015/16

4 Power over the relevant activities of the entity based on substantive rights

5 In liquidation



For ease of presentation, the internal designations of the entities are stated in the following tables and explanations.

For all entities mentioned above the headquarter of the company complies with the country of incorporation.

With exception of the following entities all mentioned subsidiaries report at balance sheet date as of 31 March:

Entities which don't report at balance sheet date as of 31 March due to legal restrictions:

- ▶ Kapsch TrafficCom Russia OOO, Moscow, Russia (31 December)
- ▶ Kapsch Telematik Technologies Bulgaria EAD, Sofia, Bulgaria (31 December)
- ▶ Kapsch TrafficCom Kazakhstan LLC, Almaty, Kazakhstan (31 December)
- ▶ Kapsch Telematic Services IOOO, Minsk, Republic of Belarus (31 December)
- ▶ Kapsch TrafficCom KGZ OOO, Bishkek, Kyrgyzstan (31 December)

Further entities with deviating balance sheet date:

- ▶ KTS Beteiligungs GmbH, Vienna  
The entity was acquired, the balance sheet date as of 31 December has not been adopted.
- ▶ Kapsch TrafficCom Lietuva UAB, Vilnius, Lithuania  
The entity was incorporated together with a partner and reports as of 31 December.

### 30 Non-controlling interests.

The non-controlling interests represent the third party shares in the equity of consolidated subsidiaries.

#### Information on the balance sheet

The balance sheet of the consolidated subsidiaries with material non-controlling interests and the carrying amount of material non-controlling interests are represented below:

Information on the balance sheet as of 31 March 2016	Amounts before intercompany eliminations					Net	Carrying amount of non-controlling interests
	Non-current assets	Current assets	Non-current liabilities	Current liabilities			
KTS CZ	1,285	36,076	0	18,545	18,816	8,772	
Streetline	804	1,324	441	2,667	-979	-516	
Remaining						-444	
<b>Carrying amount as of 31 March 2016</b>						<b>7,811</b>	

Information on the balance sheet as of 31 March 2015	Amounts before intercompany eliminations					Net	Carrying amount of non-controlling interests
	Non-current assets	Current assets	Non-current liabilities	Current liabilities			
KTS CZ	1,446	34,115	0	17,147	18,414	8,579	
KTS Poland	3,582	34,890	1,198	20,699	16,575	0	
TMT	8,576	7,259	1,483	3,454	10,899	4,374	
ETC	3,552	34,412	33,334	17,363	-12,733	-1,044	
KTS Austria	4,486	6,399	0	23	10,862	0	
Remaining						-506	
<b>Carrying amount as of 31 March 2015</b>						<b>11,403</b>	

### Information on the statement of comprehensive income

The statement of comprehensive income of the consolidated subsidiaries with material non-controlling interests are represented below:

Information on the statement of comprehensive income 2015/16	Amounts before intercompany eliminations			Amounts attributable to non-controlling interests			
	Revenues	Result for the period	Other comprehensive income	Total comprehensive income	Result for the period	Other comprehensive income	Total comprehensive income
KTS CZ	80,332	14,001	368	14,369	6,720	177	6,897
TMT	19,461	2,461	4,365	6,826	913	1,619	2,532
ETC	52,881	-12,001	1,961	-10,040	-1,773	255	-1,518
Streetline	2,506	-3,829	84	-3,745	-505	16	-489
Remaining					12	49	61
<b>Total</b>					<b>5,368</b>	<b>2,115</b>	<b>7,483</b>

Information on the statement of comprehensive income 2014/15	Amounts before intercompany eliminations			Amounts attributable to non-controlling interests			
	Revenues	Result for the period	Other comprehensive income	Total comprehensive income	Result for the period	Other comprehensive income	Total comprehensive income
KTS CZ	75,572	14,595	-37	14,558	7,111	-18	7,093
KTS Poland	66,294	16,062	-3	16,060	535	-2	533
ETC	53,567	1,311	-1,327	-16	71	-172	-102
TMT	19,343	164	1,051	1,215	61	390	450
KTS Austria	0	10,668	0	10,668	-7	0	-7
Remaining					7	1	8
<b>Total</b>					<b>7,778</b>	<b>198</b>	<b>7,976</b>

### Information on the cashflow statement and dividends

The cashflow statement and dividends of the consolidated subsidiaries with material non-controlling interests are represented below:

Information on the cashflow statement 2015/16	Cashflow from			Cash Net-increase/decrease	Dividends paid to non-controlling shareholders
	Operations	Investing activities	Financing activities		
KTS CZ	20,726	-482	-13,967	6,276	-6,704
Streetline	-465	-2,109	3,239	665	0
Remaining					-4
<b>Total</b>					<b>-6,709</b>

Information on the cashflow statement 2014/15	Cashflow from			Cash Net-increase/decrease	Dividends paid to non-controlling shareholders
	Operations	Investing activities	Financing activities		
KTS CZ	15,062	-433	-14,012	616	-6,726
KTS Poland	15,965	-398	-3,505	12,063	0
ETC	2,000	0	2,148	4,148	0
TMT	-166	-294	-829	-1,288	0
KTS Austria	12,301	38	-6,099	6,240	-195
KTS Belarus	11,901	-720	-20,464	-9,283	0
Remaining					-9
<b>Total</b>					<b>-6,930</b>

The information mentioned above relate to amounts before intercompany eliminations.

### 31 Related parties.

The following transactions were performed with related parties:

#### **KAPSCH-Group Beteiligungs GmbH, Vienna**

Since January 2005 the company has provided services to the group in the area of group consolidation and legal advice. Expenses incurred by the group in the fiscal year 2015/16 amounted to TEUR 704 (2014/15: TEUR 624). Furthermore, the company invoices insurance costs (directors & officers liability insurance) to the group amounting to TEUR 22 (2014/15: TEUR 22).

In fiscal year 2014/15 the company sold 3% of its shares in Kapsch Telematic Services GmbH, Vienna, to Kapsch TrafficCom AG. After this transaction, the group is the sole shareholder of Kapsch Telematic Services GmbH, Vienna. The purchase price consists of a fixed purchase price component (TEUR 2,000) and a variable purchase price component (earn-out component, that depends on the earnings before interest and taxes (EBIT) of the KTS Group, net of non-controlling interests, of the financial years 2015-2018). The fixed purchase price (TEUR 2,000) has been already paid in fiscal year 2014/15 the variable purchase price component in the amount of TEUR 2,077 (31 March 2015: TEUR 2,036) is recorded under other non-current liabilities, see Note 24).

KAPSCH-Group Beteiligungs GmbH acts as the tax group leader in a tax group formed in March 2005, of which Austrian subsidiaries of this group are also members. Accordingly, all tax effects of the group companies that are tax group members are considered to be related party transactions.

#### **Kapsch Aktiengesellschaft, Vienna**

In connection with the use of the KAPSCH trademark and logo, the company invoices license fees to the group. The license fee amounts to 0,5% of all third-party sales of the group. Expenses incurred by the group in the fiscal year 2015/16 amounted to TEUR 2,575 (2014/15: TEUR 2,199).

Activities in the area of corporate development, public relations, sponsoring and other marketing activities are carried out centrally by Kapsch Aktiengesellschaft for all group companies. Cost allocated to the group in the fiscal year 2015/16 amounted to TEUR 1,512 (2014/15: TEUR 1,722).

Furthermore, the company invoices management and consulting services (including costs for the chairman of the executive board of the company, Georg Kapsch, and costs for consulting services of certain supervisory

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board members of the company amounted to TEUR 0 (2014/15: TEUR 90) to the group. Expenses incurred by the group in the fiscal year 2015/16 amounted to TEUR 1,750 (2014/15: TEUR 1,470).

Kapsch Aktiengesellschaft has entered into various insurance contracts covering all group companies. The cost allocated to the group in the fiscal year 2015/16 amounted to TEUR 607 (2014/15: TEUR 611). In addition Kapsch Aktiengesellschaft maintains a software tool (Hyperion Financial Management) and invoiced TEUR 120 (2014/15: TEUR 130) to the group for this service.

**Kapsch Partner Solutions GmbH, Vienna**

The company provides human resources services (payroll services, administration, recruiting, advice on labor law and human resources development) to the group and provides apprentices and trainees. Expenses incurred by the group in the fiscal year 2015/16 amounted to TEUR 1,861 (2014/15: TEUR 2,181).

Kapsch Components GmbH & Co KG provides logistic services to the company amounting to TEUR 8 (2014/15: TEUR 7).

**Kapsch Financial Services GmbH, Vienna**

The company leases telephone and IT equipment (hardware and software) to the group and provides IT support. Expenses incurred by the group in the fiscal year 2015/16 amounted to TEUR 290 (2014/15: TEUR 877).

**Kapsch BusinessCom AG, Vienna**

The company delivers hardware (IT equipment) on behalf of Kapsch TrafficCom AG, Vienna, and provides maintenance and other services for various customer projects, the largest of which by far are the “truck toll collection system Austria” and the “truck toll collection system Poland”, in the previous year as well the “truck toll collection system of the Republic of Belarus”. The deliveries and services performed amounted to TEUR 3,132 in the fiscal year 2015/16 (2014/15: TEUR 3,592).

The company provides IT, data processing and telephone services to the group amounting to TEUR 5,303 (2014/15: TEUR 5,498), as well as other services amounting to TEUR 326 (2014/15: TEUR 111).

Kapsch Components GmbH & Co KG provides logistic services to the company amounting to TEUR 80 (2014/15: TEUR 76) and other services amounting to TEUR 14 (2014/15: TEUR 185).

**Kapsch CarrierCom AG, Vienna**

Kapsch Components GmbH & Co KG provides logistic services to the company amounting to TEUR 798 (2014/15: TEUR 736), manufacturing services for GSM-R amounting to TEUR 9,163 (2014/15: TEUR 7,433) and provides the company with other deliverables and performances amounting to TEUR 549 (2014/15: TEUR 277).

**Kapsch CarrierCom France SAS, Paris**

Kapsch Components GmbH & Co KG provides manufacturing services to the company for GSM-R projects amounting to TEUR 1 (2014/15: TEUR 6,105) and provides the company with other logistic services amounting to TEUR 106 (2014/15: TEUR 169).

**Kapsch CarrierCom s r.o., Prague**

The company supplies hardware (IT-equipment) to the group for a customer project and provides other services for the project in in the Czech Republic. The value of goods and services delivered in the fiscal year 2015/16 amounts to TEUR 52 (2014/15: TEUR 171).

**Kapsch BusinessCom s r.o., Prague**

The company provides technical maintenance services for the Czech truck toll collection system and is responsible for the current IT support for the Czech subsidiaries. Expenses incurred for this in the fiscal year 2015/16 totaled TEUR 4,279 (2014/15: TEUR 3,709). Furthermore, the company provided public relations services amounting to TEUR 91 in the fiscal year 2015/16 (2014/15: TEUR 90) and other services amounting to TEUR 64 (2014/15: TEUR 93).

**Kapsch Sp. z o.o., Warsaw**

The Company provides hardware (IT equipment) to the group and renders maintenance and other services for the customer project in Poland. These services amounted to TEUR 1,723 in the fiscal year 2015/16 (2014/15: TEUR 2,031).

**Kapsch Immobilien GmbH, Vienna**

The company provides services in the area of motor vehicle management and automotive services amounting to TEUR 107 (2014/15: TEUR 150) in the fiscal year 2015/16.

**Other related parties transactions**

Lease income of the group resulting from the sub-lease to related parties in the fiscal year 2015/16 totaled TEUR 481 (2014/15: TEUR 491).

In the prior year (fiscal year 2014/2015) Erwin Toplak, former member of the Managing Board of Kapsch TrafficCom AG, Vienna, received a dividend for his shareholding in Kapsch Telematic Services GmbH, Vienna, in the amount of TEUR 195. As of 31 March 2016 Erwin Toplak does not hold any shares in Kapsch Telematic Services GmbH, Vienna. Relating to this, no dividend was distributed in fiscal year 2015/2016.

Liabilities for pension benefits include pension obligations (pensions in payment) to the widow of Karl Kapsch, a former board member of Kapsch Aktiengesellschaft.

Services are usually negotiated with related parties on a cost-plus basis. Goods are bought and sold at arm's length.

The following tables provides an overview of revenues and expenses in the respective fiscal years as well as receivables from and payables due to related parties at the respective balance sheet dates:

	2015/16	2014/15
<b>Parent company</b>		
Revenues	0	0
Expenses	726	646
<b>Affiliated companies</b>		
Revenues	11,305	15,565
Expenses	23,764	23,867
<b>Other related parties</b>		
Revenues	149	184
Expenses	396	1,027

	2015/16	2014/15
<b>Parent company</b>		
Trade receivables and other assets	0	0
Trade payables and other payables	4,481	4,360
Liabilities from share purchase	2,077	2,036
<b>Affiliated companies</b>		
Trade receivables and other assets	1,728	2,107
Trade payables and other payables	3,512	3,738
<b>Other related parties</b>		
Trade receivables and other assets	15	127
Trade payables and other payables	293	289

### 32 Earnings per share.

Earnings per share (undiluted earnings) are calculated by dividing the result for the period attributable to equity holders of the company by the weighted average number of ordinary shares in issue during the year, excluding, if any, ordinary shares purchased by the Company and held as treasury shares. As of 31 March 2016, as in the prior year, no treasury shares were held by the company. There were no dilutive effects.

	2015/16	2014/15
Result for the period attributable to equity holders of the company (in EUR)	31,091,775	3,629,908
Weighted average number of ordinary shares	13,000,000	13,000,000
<b>Earnings per share (in EUR)</b>	<b>2.39</b>	<b>0.28</b>

### 33 Events after the balance sheet date.

- On 14 December 2015, Kapsch TrafficCom concluded an agreement with Schneider Electric S.E. concerning an acquisition of its global transportation business. The Closing was on April 1, 2016.

The transportation segment, which previously operated under the name Telvent Tráfico y Transporte, is a provider of real-time IT solutions and intelligent traffic systems for use in cities, on highways and in tunnels. The portfolio also includes tolling and transit solutions. The acquisition will enable Kapsch TrafficCom to offer existing and future customers an integrated portfolio of intelligent transportation solutions from the highway into the city.

Consideration paid	30,000
Adjustment of purchase price (provisionally determined)	-2,558
<b>Purchase price total (provisionally determined)</b>	<b>27,442</b>
Less fair value of net assets acquired (provisionally determined)	-30,432
<b>Difference between purchase price and net assets acquired (provisionally determined)</b>	<b>-2,991</b>

Assets and liabilities resulting from the acquisition are shown as follows (provisionally determined):

	<b>Fair value</b>
Property, plant and equipment	721
Intangible assets	5,170
Other non-current assets	157
Inventories	656
Receivables and other current assets	57,013
Cash and cash equivalents	9,542
Liabilities, other liabilities and deferred income	-42,827
<b>Net assets acquired (provisionally determined)</b>	<b>30,432</b>

The above presentation is based on a preliminary purchase price allocation. The values may change subject to the audit to be performed on the opening balances as well as any contractually stipulated purchase price adjustments.

- ▶ On 21 April 2016, the Kapsch TrafficCom Holding Corp., USA acquired non-controlling interests in ParkJockey Global, Inc., U.S.A., approximately amounting to EUR 2.4 million.
- ▶ Under the condition precedent of a still pending contractually defined consent, Kapsch Telematic Services GmbH, Austria, acquires 48 % in Kapsch Telematic Services spol. s r.o., Prague, Czech Republic, thus holding 100 % shares in the company that operates the toll system in the Czech Republic.
- ▶ With a view to refinance the corporate bond and to finance future growth, Kapsch TrafficCom AG prepares a promissory note bond addressing institutional investors in the public market. It was distributed on 1 June 2016. This transaction is planned to be completed in the course of the first quarter of the fiscal year 2016/17.

### 34 Supplementary disclosures.

The average number of staff in the fiscal year 2015/16 was 3,329 salaried employees and 186 waged earners (2014/15: 3,313 salaried employees and 196 waged earners).

#### Expenses for the auditor

The expenses for the auditor amount to TEUR 193 (2014/15: TEUR 199) and are broken down as follows:

	<b>2015/16</b>	<b>2014/15</b>
Audit of the consolidated financial statements	56	55
Other assurance services	80	65
Tax advisory services	0	0
Other services	57	79
	<b>193</b>	<b>199</b>

#### Compensation and other payments to members of the executive and the supervisory board

In the fiscal year 2015/16, the following persons served on the executive board:

Georg Kapsch (Chief Executive Officer)  
 André Laux  
 Alexander Lewald (since 1 November 2015)

The compensation paid to members of the executive board is shown below:

	Fix	Variable	Total	Total
	2015/16	2015/16	2015/16	2014/15
Georg Kapsch	653	0	653	643
André Laux	374	117	490	472
Alexander Lewald	133	0	133	0
<b>Total</b>	<b>1,160</b>	<b>117</b>	<b>1,276</b>	<b>1,114</b>

Expenses for termination benefits after use of provision for members of the executive board amount to TEUR 9 (2014/15: TEUR 59).

Individual pension agreements are granted to André Laux and Alexander Lewald. Therefore Kapsch TrafficCom AG paid TEUR 23 (2014/15: TEUR 10) to an external pension fund.

In the fiscal year 2015/16, the following persons served on the supervisory board:

Franz Semmerneegg (Chairman)  
Kari Kapsch (Deputy-Chairman)  
Sabine Kauper  
Harald Sommer

Delegated by the works council:

Christian Windisch  
Martin Gartler

Remunerations paid to supervisory board members (inclusive travel costs) amounted to TEUR 122 (2014/15: TEUR 46) in total.

As in the previous years, no advances or loans were granted to members of the executive and supervisory board, nor any guarantees issued in their favor.

Authorized for issue:  
Vienna, 8 June 2016



Georg Kapsch  
Chief Executive Officer



André Laux  
Executive board member



Alexander Lewald  
Executive board member



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# Auditor's Report.

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## Report on the Consolidated Financial Statements.

We have audited the accompanying consolidated financial statements of Kapsch TrafficCom AG, Vienna, which comprise the consolidated balance sheet as of 31 March 2016, the consolidated statement of comprehensive income, the consolidated cash flow statement and the consolidated statement of changes in equity for the fiscal year then ended, and the notes to the consolidated financial statements.

### **Management's Responsibility for the Consolidated Financial Statements**

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with International Financial Reporting Standards (IFRSs) as adopted by the EU, and the additional requirements under Section 245a UGB, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

### **Auditor's Responsibility**

Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit in accordance with Austrian generally accepted auditing standards. Those standards require the application of the International Standards on Auditing according to which we are to comply with ethical requirements and to plan and perform the audit to obtain reasonable assurance whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Group's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We draw attention to the fact that the English translation of this auditor's report according to Section 274 of the Austrian Commercial Code (UGB) is presented for the convenience of the reader only and that the German wording is the only legally binding version.

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We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

**Opinion**

Our audit did not give rise to any objections. In our opinion, the consolidated financial statements comply with legal requirements and give a true and fair view of the financial position of the Group as of 31 March 2016 and of its financial performance and its cash flows for the fiscal year then ended in accordance with International Financial Reporting Standards (IFRSs) as adopted by the EU and the additional requirements under Section 245a UGB.

## Comments on the Management Report for the Group.

Pursuant to statutory provisions, the management report for the Group is to be audited as to whether it is consistent with the consolidated financial statements and as to whether the other disclosures are not misleading with respect to the Group's position. The auditor's report also has to contain a statement as to whether the management report for the Group is consistent with the consolidated financial statements and whether the disclosures pursuant to Section 243a UGB are appropriate.

In our opinion, the management report for the Group is consistent with the consolidated financial statements. The disclosures pursuant to Section 243a UGB are appropriate.

Vienna, 8 June 2016

PwC Wirtschaftsprüfung GmbH



signed:  
Peter Pessenlehner  
Austrian Certified Public Accountant

We draw attention to the fact that the English translation of this auditor's report according to Section 274 of the Austrian Commercial Code (UGB) is presented for the convenience of the reader only and that the German wording is the only legally binding version.

## Kapsch TrafficCom AG, Vienna

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# Management Report

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## Kapsch TrafficCom AG, Vienna as of 31 March 2016 (Translation)

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### 1 General economic situation

#### Global economy

The 2015 economic development lagged behind the prior year's development but still showed a robust global economic growth of 3.1% (2014: 3.4%). While the developed economies were gradually gaining momentum, the emerging and developing countries again reported weaker growth; nonetheless, these countries accounted for approx. 70% of global economic growth. After a growth of 3.5% in 2014, global trade expanded by only 2.8% as a result of the weaker economic situation in 2015. The volumes of internationally traded goods and services are however predicted to grow more strongly in 2016. The economic forecast for the upcoming years shows a somewhat more dynamic development of the global economy. The International Monetary Fund (IMF) predicts global economic growth of 3.2% for 2016 and 3.5% for 2017.

#### U.S.A.

As in the previous year, the U.S. economy expanded by 2.4% in 2015. The Federal Reserve (Fed) changed its interest policy for the first time since 2006 by raising the US key interest rate (ranging from 0.25% to 0.5%). Due to the early announcement and the rather gradual "normalisation" of the monetary policy, the impact of this change on the economy was however negligible. The economic confidence was dampened in the reporting period by the strong appreciation of the dollar which put a strain on the export business. Privat consumption remained the key driver for growth.

#### Emerging and developing countries

In the reporting period, the emerging and developing countries have reported the lowest growth (4.0%) since the financial crisis 2008/09, with the still low commodity prices - among other things - inhibiting the economic development.

China's economy declined to reach a level of below 7%, and at 6.9%, showed the lowest value since 1990. The country currently is in a transformation process, changing from labour-intensive and export-intensive production to an economy that is more strongly based on technology and service. For the upcoming years, it is predicted that China's economy will once more slow down to 6.5% in 2016 and to 6.2% in 2017. Overall, Asia still reports a positive development. India achieved a significant GDP growth of 7.3% in 2015. With regard to the ASEAN 5 countries, at least a gradual improvement of the economic performance can be seen: GDP growth improved from 4.6% in the prior year to 4.7% in 2015 and is expected to improve even more in the upcoming years according to the IMF.

The Commonwealth of Independent States (CIS) was still in the grip of the Russia-Ukraine conflict, low oil prices and high inflation. In consequence, the economic performance fell by 2.8%, after having shown at least moderate growth of 1.1% in 2014. Russia, the biggest CIS member in terms of economy, faced a GDP decline of 3.7% in 2015. As in the previous year, the economic outlook was bleak due to the drop in the oil price, the economic sanctions of the EU and the depreciation of the rouble.

In Latin America (including the Caribbean), the economic performance also fell in 2015, even if only to a moderate extent (-0.1%). Weak commodity prices, declining demand, highly volatile financial markets and structural problems led to negative growth rates particularly with regard to the bigger economies, such as Brazil, Venezuela and Argentina. Other economies like Peru, Mexico or Chile at least were able to achieve low one-digit expansion rates.

The generally subdued economic development prevailing in the reporting period was also observed in sub-Saharan Africa and the MENAP region (Middle East, North Africa, Afghanistan and Pakistan), with growth significantly slowing down to 3.4% in sub-Saharan Africa and the MENAP region growing by only 2.5% after a growth of 2.8% in the prior year.

## **Europe**

Economic growth stabilised compared to the previous year in Europe in 2015, with aggregate GDP of the EU-28 growing by 1.9%. This development was particularly due to strong consumption, while the companies' willingness to invest was affected by the subdued global economy. The diverse developments at country level were also remarkable: While GDP growth in the big economies such as Germany (+1.7%) and France (+1.1%) was below the EU average, Ireland expanded at a relatively strong pace (+6.9%). Economists expect growth in Europe in 2016 to remain unchanged given the difficult international environment. The situation on the labour market, however, is expected to further improve. With a rate of below 10% in the EU-28 in 2015, unemployment improved to 8.9% at the beginning of 2016 which is the lowest level in seven years.

The economic trend in the euro area lagged behind the overall trend in the EU in 2015. The economy in the monetary union was up on the prior year by 1.6%. Although the majority of the euro countries did not slip into a deflation phase as predicted, the planned inflation target of just under 2% was not achieved. The European Central Bank (ECB) therefore extended its expansive monetary policy in the reporting period and prolonged the programme to purchase government bonds and other securities until at least the end of March 2017. Moreover, the key interest rate was lowered to 0% for the first time in history with a view to further promote the flow of money into the real economy.

Central and Southeast Europe reported a slight improvement in their economic development in 2015, with the region further gaining on the EU-28. The positive regional development was marked by the still precarious situation in Ukraine and Russia. Czechia, Romania, Poland and Slovakia however each achieved GDP growth of more than 3%. In 2016, Central and Southeast Europe is expected to remain on an overall stable growth path.

## **Austria**

The moderate economic development continued over the reporting period in Austria, showing GDP growth of 0.9% in 2015. Foreign trade contributed less to this development compared to the past. In specific terms, the nominal increase in exported goods stood at only 2.7% due to the economic downturn in the emerging countries and the EU sanctions on Russia. Nevertheless, economists expect a slightly stronger GDP growth of 1.6% for 2016.

### **1.1 Development of the market for Intelligent Transportation Systems (ITS)**

Kapsch TrafficCom addresses the market for Intelligent Transportation Systems (ITS). ITS employ information and communication technologies to support and optimise road transportation, including infrastructure, vehicles, users and industries.

### 1.1.1 Market segmentation

The study "Intelligent Transportation Systems - A global strategic business report" from Global Industry Analysts, April 2014, describes the ITS market as a diverse market with widely differing application and product segments. Thus, the market comprises the following three product segments:

**Electronic Toll Collection (ETC)** enables drivers to pay toll fees without stopping at toll stations.

**Advanced Traffic Management Systems (ATMS)** used for monitoring traffic, optimising signal timings and regulating the flow of traffic.

**Other Intelligent Transportation Systems (OTH)** comprise

- ▶ **Commercial Vehicle Operations (CVO)** encompassing systems for operating commercial vehicles in order to enhance freight carrier productivity and safety,
- ▶ **Public Vehicle Transportation Management Systems (PVTMS)** facilitating management of both local and long-distance public transportation, and
- ▶ **Advanced Vehicle Information Systems (AVIS)** enhancing traffic safety and security.

### 1.1.2 Market volume and growth

Global Industry Analysts (April 2014) estimated that the global volume of the ITS market amounted to approx. USD 17.2 billion in 2015 and is expected to continue growing. The largest product segment in 2015 was Other Intelligent Transportation Systems, accounting for 38.8% (USD 6.7 billion). Based on a worldwide volume of USD 4.5 billion, ETC had an ITS market share of 26.0%. The largest geographic region for ITS in 2015 was the U.S.A. at 38.2%, followed by Europe at 30.3%.

According to this study, the ITS market is expected to grow at an average annual rate of 8.7% between 2012 and 2020 to reach a global volume of USD 26.3 billion in 2020, of which ETC will account for USD 7.8 billion, equaling a share of 29.5% and thereby exhibiting the fastest growth of all product segments at an average annual rate of 11.5%.

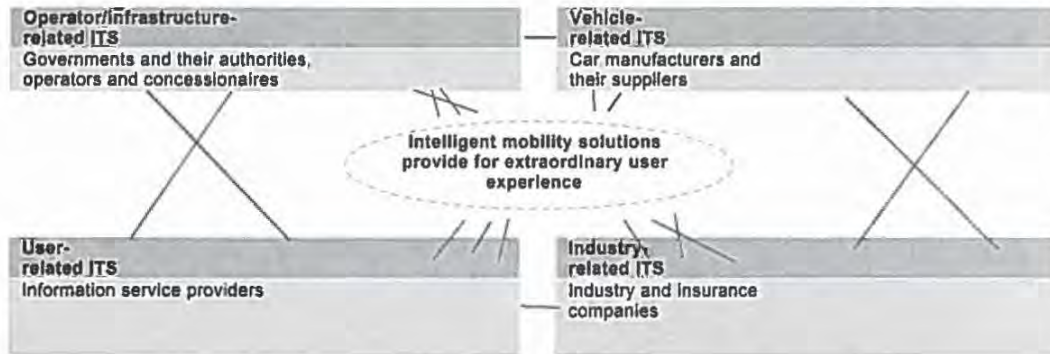
**Global ITS market by product segments and geographic regions (in USD billion)**

Product segments	2012	2015	2020	Regions	2012	2015	2020
ATMS	4.9 (37%)	6.0 (35%)	8.8 (34%)	U.S.A.	40%	38%	38%
ETC	3.3 (24%)	4.5 (26%)	7.8 (30%)	Europe	30%	30%	28%
OTC	5.3 (39%)	6.7 (39%)	9.7 (36%)	Japan	17%	17%	15%
				China	5%	6%	9%
				Other	8%	8%	10%

The past four years have shown that trends on the ITS market have arisen – in part due to economic conditions – that significantly influenced the development. Due to a lack of current studies, it is difficult to estimate how much the current market volume deviates from these forecasts from 2012.

### 1.1.3 Customer segments

Kapsch TrafficCom has developed its own understanding and view of the ITS market in order to define and develop its own market positioning. To this end, the ITS market was divided into four customer segments and the corresponding primary addressees were identified.



**Operator/infrastructure-related ITS** encompasses both ETC and ATMS as well as applications for urban access and parking. The addressees are governments and their authorities, road and toll operators as well as concessionaires, that develop transport policies using ITS to ensure the availability and quality of the infrastructure in a way that improves safety and security, performance, and environmental protection.

**Vehicle-related ITS** aims at in-car telematics such as remote diagnostics or driver assistance systems (AVIS). They are intended mainly to enhance vehicle productivity, particularly that of commercial vehicles (CVO), as well as traffic safety and security. Addressees are car manufacturers and their suppliers. This field also includes systems for real-time interaction between vehicles (vehicle-to-vehicle; V2V) as well as between vehicles and infrastructure (vehicle-to-infrastructure; V2I), collectively abbreviated as V2X, which Kapsch TrafficCom believes will be based on 5.9 GHz technology.

**User-related ITS** focuses mainly on convenience and efficiency for travelers. The customer in the car receives information to aid in orientation during the journey, thereby increasing traffic safety. Example applications for Advanced Vehicle Information Systems (AVIS) include for example transmitting traffic-related vehicle information to travelers before or during the journey as well as navigation services. Addressees are information service providers such as mobile network operators, radio broadcasters and vendors of portable navigation devices, as well as end users particularly with regard to future solutions.

**Industry-related ITS** encompasses commercial applications designed to reduce the costs or maximise the yield of vehicle fleet operators, including public transportation companies (PVTMS). Example applications include systems for fleet management and for collecting information on the logistics of large-scale vehicle operators. Among the addressees are insurance companies, who see pay-as-you-drive car insurance as a promising way to attract new customers by offering fair insurance rates and ITS-based value-added mobility services.

### 1.1.4 Market positioning

The current focus of Kapsch TrafficCom aims at the operator/infrastructure-related segment of the ITS market. In line with its Strategy 2020 and the goal to become a leading provider of intelligent mobility solutions, the focus will also be more on vehicle-related and user-related ITS. Kapsch TrafficCom also monitors the ongoing developments in industry-related ITS.

### 1.1.5 Market trends and drivers

Kapsch TrafficCom believes that the following matters are the main drivers for the market which it currently addresses.

**Mobility.** As prosperity rises, people want to be more mobile which thus leads to an increasing demand with regard to traffic systems. Mobility is increasingly perceived as a basic need or as a necessity. The traffic systems to meet this need or necessity vary considerably at global level. Taking the number of passenger cars per 1,000 inhabitants as an indicator to measure the level of development shows the catch-up potential in many countries: While the U.S.A. have an average of 800 passenger cars per 1,000 inhabitants, the rate declines to almost 100 passenger cars in Southamerican countries and in part significantly even below that number in Africa. If the emerging countries, such as China or Brazil, continue to gain in terms of economy at the same pace, individual traffic is expected to also grow strongly. The trend of newly registered cars confirms this development. In China alone more than 18 million new cars were registered in 2014 – up by one third compared to the EU taken as a whole. More than 30 cities in China today have more than 1 million cars.

**Urbanisation.** The number of people living in cities is growing. While only 2% of the global population lived in cities in 1800, this percentage rose to above 50% of the global population for the first time in 2007. According to forecasts, the number of people living in cities will reach 60% until 2030 and will again rise to 70% by 2050. Based on these numbers, there will be 40 mega cities with more than 10 million inhabitants already by 2025. This growth trend poses great challenges also for urban traffic infrastructure and means investments in intelligent and sustainable traffic systems.

**Climate protection.** Traffic in Europe is responsible for more than one quarter of the energy consumption and CO<sub>2</sub> emissions, road traffic makes up 20%. Today, 64% of all kilometres are travelled in urban environment. In Vienna, about one third of traffic-related CO<sub>2</sub> emissions alone is attributable to finding a parking space. The total annual amount of kilometres travelled in cities is expected to almost treble from 25.8 trillion to 67.1 trillion from 2010 to 2050. Based on this development, city dwellers will spend 106 hours per year in tailbacks in 2050. In addition to statutory provisions for the automobile industry to curb CO<sub>2</sub> emissions, a changed usage pattern and particularly intelligent traffic management systems are required to achieve substantial improvements.

**Expansion and funding of traffic infrastructure.** The basic need for mobility, increasing urbanisation as well as the increasing freight traffic in global economic exchange show the limits of today's traffic systems. Motorways built decades ago no longer meet the requirements. Despite intensive efforts to make railway transport more attractive, Europe's road traffic has been strong for years now.

The willingness of governments to invest in the expansion of transport systems is, among other things, related to reliable funding options. While Austria has increased investments in the motorway network over the past ten years, Germany, Japan and the United Kingdom cut back on investments in this sector.

At a total length of 84,700 km in 2005, the Trans-European Network (TEN-T) covered about 25% of the total primary road network in the European Union, but accounted for only 40% of road traffic. Until 2020, an average expansion of 4,800 km per year is expected, of which 3,500 km existing roads. It is particularly in the new EU Member States as well as the corridors leading to these countries that have a high demand for investments. In its white paper "European transport policy for 2010", the European Commission states investment costs of EUR 600 billion until 2020. Traffic is thus expected to increase in the longer term. Investments are required for the construction of new infrastructure as well as for maintenance and servicing of existing road infrastructures.

About USD 55 billion is invested in the road infrastructure in the USA per year. Experts, however, estimate at least a doubling of this amount to more than USD 100 billion in the upcoming years in order to maintain functionality. The high funding requirements change business models and foster the emergence of private concession models.



Given the constraints on government budgets, alternative financing models with private investors participating will gain in importance over the next years. In order to ensure an economic operation of motorways, toll systems and traffic management systems will also become more important in the future.

#### **1.1.6 Technology**

The ITS market and/or environmental factors are affected by new technologies and fast technology cycles, opening new perspectives for Kapsch TrafficCom. The apparently conflicting targets of managing traffic on the one hand and the opportunities created by mobility on the other hand have to be solved in an intelligent fashion. Technological and organisational means are to be employed in such a manner so that the demand for transport neither affects the

environment nor the economic development. Kapsch TrafficCom is going to make an important contribution to this goal also in the future.

#### **1.1.7 Intelligent mobility solutions**

In the past years, a convergence on the ITS market began – an increasing convergence of individual market segments. Anticipating this development, although not at this pace, Kapsch TrafficCom has evolved from a mere supplier of Electronic Toll Systems (ETC) to a supplier who includes select ITS applications. Today, Kapsch TrafficCom believes that intelligent and comprehensive mobility solutions will be the future. The Company therefore endeavours to play a leading role in this development. This goal is defined in the Strategy 2020, with the Company striving to create an Intelligent Mobility Solutions (IMS) business. In order to achieve this goal, end customers are also more directly addressed and the portfolio is expanded to include urban infrastructure in addition to motorways.

## 2. Economic situation of Kapsch TrafficCom AG

### 2.1 General situation

In fiscal year 2015/16, Kapsch TrafficCom AG generated net sales in the amount of EUR 140.0 million, meaning a decline of 3.2% year on year. The Electronic Toll Collection (ETC) segment contributed 91.7% to the generated net sales, representing the core business with tolls collected. The Intelligent Mobility Solutions (IMS) segment contributed 8.3% in the reporting period.

In Austria, about 2,200 km of motorways and expressways are equipped with fully electronic toll systems for trucks above a maximum authorised vehicle weight of 3.5 tons, with Kapsch TrafficCom AG delivering the complete central and roadside infrastructure for almost 490 toll stations and now about 1 million on-board units (GO boxes) since 2004. As in the previous year, the average toll transaction rate generated in Austria remained at the high prior-year percentage of 99.8%. On 27 September 2011, the Company reached a basic agreement with ASFINAG Maut Service GmbH to renew the current operation and maintenance agreement for the nationwide electronic truck toll collection system in Austria until the end of 2018, with the renewal until June 2017 having already been ultimately confirmed by ASFINAG Maut Service GmbH.

On 17 August 2015, Kapsch TrafficCom was commissioned to further expand the Belorussian toll road network. In total, the toll system "BeIToll" is planned to be expanded by 323 km from previously 1,200 km to more than 1,500 km within 10 months. Kapsch TrafficCom AG acts both as a developer as well as an operator of the toll system via its subsidiary Kapsch Telematic Services IOOO. An operating life of 20 years is envisaged.

On 18 August 2015, the Dutch Rijkswaterstaat, responsible for the construction and maintenance of road infrastructure, and Highways England, the English department responsible for operating and maintaining motorways, commissioned Kapsch TrafficCom on 7 October 2015 to deliver the advanced traffic management system DYNAC for the cross-border programme "CHARM", a joint programme of the English and Dutch authorities. The aim of this programme is an extensive modernisation and consolidation of motorway traffic management within 26 months. The order volume totals EUR 60 million, covering also services for a period of up to 13 years after the successful implementation of the system.

On 14 December 2015, Kapsch TrafficCom and Schneider Electric S.E. agreed on the transfer of the global transportation business. The transportation division, previously operating under the Telvent Tráfico y Transporte brand, offers real-time IT solutions and intelligent traffic systems for use in cities, on motorways and in tunnels. The portfolio also includes toll and transit solutions. This transfer enables Kapsch TrafficCom to offer an integrated combination of intelligent traffic solutions covering motorways and cities to existing and future customers around the world. The transfer was completed on 1 April 2016. Kapsch TrafficCom AG acquired the two Spanish companies and the "Ecotrafix" brand.

## 2.2 Financial performance indicators

### a. Earnings situation

Net sales of Kapsch TrafficCom AG reached EUR 140.0 million in fiscal year 2015/16, thus down by 3.2% on the previous year (EUR 144.7 million). The Intelligent Mobility Solutions (IMS) segment exhibited a growth in net sales from EUR 4.0 million in the previous year to EUR 11.6 million. The Electronic Toll Collection (ETC) segment generated net sales in the amount of EUR 128.4 million (previous year EUR 140.7 million).

In comparison with the previous year, personnel expenses fell by EUR 5.5 million from EUR 43.4 million to EUR 37.9 million. The average number of staff fell from 552 to 455 in the fiscal year under review.

Other operating expenses were down by EUR 3.8 million from EUR 40.9 million to EUR 37.1 million in fiscal year 2015/16.

The operating result (EBIT) of Kapsch TrafficCom AG rose to EUR 21.3 million in the reporting year compared to EUR 17.8 million in the previous year.

The financial result of EUR 12.6 million (previous year: EUR 8.0 million) was mainly attributable to the income from investments.

### b. Assets and liabilities

The balance sheet total of EUR 377.6 million at the balance sheet date 31 March 2016 fell by EUR 0.8 million compared to the end of fiscal year 2014/15 (31 March 2015: EUR 378.4 million).

At EUR 242.9 million, equity exceeded the amount of EUR 221.1 million as of 31 March 2015. Kapsch TrafficCom AG's equity ratio thus increased from 58.4 % as of 31 March 2015 to 64.3% as of 31 March 2016.

On the assets side, inventories increased slightly from EUR 7.5 million to EUR 8.1 million.

The group receivables (incl. borrowings) fell from EUR 224.5 million in the previous year to EUR 180.7 million in the reporting year, thus affecting liquid funds that rose from EUR 30.0 million to EUR 58.4 million.

On the liabilities side of the balance sheet, long-term liabilities in particular fell from EUR 89.5 million in the previous year to EUR 70.8 million as of the balance sheet date 31 March 2016.

The short-term liabilities decreased from EUR 62.0 million in the previous year to EUR 58.0 million as of the balance sheet date 31 March 2016. At EUR 19.0 million, the group liabilities as of 31 March 2016 remained almost at prior-year's level (EUR 18.5 million). The short-term bank loans and overdrafts fell from EUR 21.8 million to EUR 15.9 million as of 31 March 2016.

### c. Financial position

The net cash flow from operating activities amounted to EUR 47.9 million after EUR 34.6 million in the comparative prior-year period. This development was particularly attributable to the decrease in receivables from affiliated companies.

The net cash flow from investing activities in the amount of EUR 14.5 million (previous year: EUR 8.8 million) mainly results from the financing of subsidiaries.

The net cash flow from financing activities in the amount of EUR -34.1 million (previous year: EUR -20.7 million) resulted from the repayment of financial liabilities and the payment of the dividend. In total, cash and cash equivalents increased from EUR 30.0 million as of 31 March 2015 to EUR 58.4 million as of 31 March 2016.

### 3. Additional company information

#### Research and development

Kapsch TrafficCom AG has a global network of research and development centres in Vienna and Klagenfurt (Austria), Jönköping (Sweden), Bologna (Italy), Buenos Aires (Argentina), Mississauga (Canada), Kingston, Duluth, Pleasanton and San Mateo (U.S.A.), and Cape Town (South Africa). Research and development (R&D) are a high priority for Kapsch TrafficCom AG with respect to achieving its strategic goals. To ensure the inventiveness of the company, development departments exist for all strategic business fields to specifically work on new solutions for customer needs.

The following focal areas were defined in the past fiscal year:

The developments towards a modern platform for ETC back office solutions were consistently pursued. In doing so, special focus was on the integration and application of new technologies, such as data analytics tools or open source standard modules. Moreover, Kapsch TrafficCom AG further developed the different roadside platforms and launched a programme to gradually combine the different product lines.

Investments continue to be made to improve vehicle identification and classification sensors. The new generation of sensors increases the measurement accuracy and thus further optimises the overall performance of the solutions.

Kapsch TrafficCom AG develops DSRC components (on-board unit and transceiver) for the Italian market that are meant to support the special Italian radio standard ETSI-TS 102 708, HDR (High Data Rate). Basic development and certification of the transceiver were completed in the reporting period. The on-board unit is planned for 2017.

Kapsch TrafficCom AG's satellite-based toll system gains in importance due to the change in the toll market because the integration of smartphones and other terminal devices in addition to the GNSS on-board units expands the scope of the functions as well as the range of applications. Modernising the technologies used on an ongoing basis enables Kapsch TrafficCom AG to offer a future-proof solution that is modular and flexible with regard to the requirements of the combined ETC-IMS market.

With regard to cooperative systems (V2X), the focus was on the further development of Kapsch's traffic management solutions for vehicle-to-vehicle and vehicle-to-infrastructure communication in the course of the research project "European Corridor". Participation in some research projects in cooperation with the automotive industry led to close contact with leading original equipment manufacturers and first tier automotive suppliers. Activities in the field of V2X vehicle equipment were also pursued and the available products further improved. In addition to developing product and solutions portfolios for cooperating systems, Kapsch TrafficCom AG is also taking an active part in the required standardisation process in the U.S.A. and in Europe.

In the field of smart parking, the subsidiary Streetline developed a new procedure to register occupancy in a cost-efficient manner which reduces the required field sensor equipment to a minimum.

In fiscal year 2015/16, Kapsch TrafficCom AG invested roughly EUR 27.3 million in research and development (previous year: roughly EUR 33.7 million).

## **Non-financial performance indicators**

### **Sustainability management**

Kapsch TrafficCom AG sees itself as particularly committed to the central aspects of sustainability not least due to the business model of the Company. Securing the long-term stability of the company in consideration of all economic, environmental and social perspectives is the overarching goal. The focus lies on achieving the efficient and sparing use of resources of all kinds, securing the profitability and innovative strength and ensuring equal opportunities and fairness with respect to all relevant interest groups.

### **Consistent sustainability orientation**

Kapsch TrafficCom AG understands sustainability as a continuous process. In recent years, the Company has begun systematising all the related agendas. One important milestone was reached with the publishing of the fourth sustainability report in May 2015, which is available at [www.kapsch.net/ktc/investor\\_relations](http://www.kapsch.net/ktc/investor_relations).

The sustainability report satisfies the requirements of the Global Reporting Initiative, GRI Guideline G3.1 (Application Level C). It also serves as a progress report for the United Nations Global Compact, which defines ten principles for protecting human rights and labor standards as well as environmental protection and fighting corruption.

The report provides comprehensive information about the central fields of action:

- Protecting the environment, conserving resources and actively protecting the climate
- Securing the innovative strength
- Product responsibility and quality assurance
- Ensuring the competitiveness and profitability
- Integrity and compliance
- Attractive and responsible employer
- Social responsibility

Figures for success measurement as well as goals for the following period have been defined for each field of action. All such agendas are coordinated by a sustainability officer and reported to the executive board. Below please find a more detailed description of select fields of action.

### **Innovative products with added value for the environment and society**

The products and solutions for intelligent transportation systems from Kapsch TrafficCom AG make valuable contributions to climate protection. They allow road users to reach their destinations quickly, efficiently and with low environmental impact. In order for these ambitions to be realised also in the future in the best possible manner, Kapsch TrafficCom AG invests heavily in research and development.

A comprehensive guideline was created to ensure that environmental, economic, social, health and safety aspects are ideally taken into account in a structured fashion in the development and the design of products. The contents of this guideline must be integrated into the specifications and project invitations to tender.

### **Quality**

The high standards of quality, safety and robust processes are a top priority in all units of Kapsch TrafficCom AG. Kapsch TrafficCom AG defines its processes in an integrated HSSEQ management system (Health, Safety, Security, Environment, Quality). This system is based on certifications according to ISO 9001 Quality Management (since 2002) as well as OHSAS 18001 Occupational Health and Safety Management and ISO 14001 Environmental Management (since 2005). Kapsch TrafficCom AG has anchored the necessary measures for ensuring the associated standards into its internal processes and continuously monitors compliance. The

certificate according to ISO 27001 defines the required information security management. A high service quality is ensured in the area of technical operation with ISO 20000 for IT service management. The so-called HSSEQ Circle meets once per quarter to discuss the status of the goals and measures from the areas of health and safety, quality, the environment and information security and to optimise work processes and information sharing. These aspects are documented in a quarterly report to the executive board.

#### **Reliability and accuracy of installed systems**

The toll transaction rate is a figure for assessing the accuracy and reliability of a toll collection system. It indicates the number of successful transactions in relation to all potential toll transactions of vehicles equipped with a functioning on-board unit. A high toll transaction rate translates to high toll income.

The average toll transaction rate of the truck toll collection system in Austria was at approximately 99.81% in 2015 (2014: 99.89%), the average transaction rate of the nationwide electronic toll collection system in Czechia was approximately 99.6% in 2015 (2014: 99.6%). The calculation of the toll transaction rate is based on methods agreed upon with the respective customer, meaning that comparisons between the average transaction rates achieved in different projects are only possible on a limited basis.

#### **Protecting the environment and conserving resources**

The business activities are associated with the consumption of raw materials and the emission of climate-relevant emissions. Kapsch TrafficCom AG works intensively on minimising these impacts. The majority of the climate-relevant effects result from the business activities of the subsidiary Kapsch Components, which is responsible for production as well as the fleet of the entire group. Through effective measures to increase energy efficiency, but also influenced by a lower production volume, Kapsch Components was able to reduce its energy consumption by 0.7% in fiscal year 2013/14 following a reduction of 5% in the previous year. The waste volume per tonne of product was reduced by 13.5% to 135 kilograms and the nitrogen consumption per tonne of products by 5.1%.

#### **Attractive and responsible employer**

##### **Staff**

The average number of employees of Kapsch TrafficCom AG in fiscal year 2015/2016 was 455 (previous year: 552). As of 31 March 2016, the Company's headcount was 427 (previous year: 512).

Kapsch TrafficCom AG makes contributions to an external pension fund for employees of group companies in Austria under a defined contribution scheme. The amounts of the payments are based on the individual employee's income and the operating profit margin of the Company.

Kapsch TrafficCom AG is aware of the employees' contribution to its success and acknowledges this through a profit participation plan. The Kapsch TrafficCom Group thus rewards the commitment of its employees by distributing to them up to 5% of the group profit before income taxes. Country-specific upper limits have been established to ensure that the distribution reflects local purchasing power. Every employee receives a share, which is independent of the person's salary or wage and limited to EUR 1,500 per employee.

Kapsch TrafficCom AG places great importance on the continued training and education of its employees. This involves not only promoting professional education but also providing seminars and workshops for developing personal skills. In addition, training sessions tailored to the particular needs of employees are offered within the framework of the Kapsch University. A job rotation programme promotes the international exchange of staff between various locations, and selected employees are prepared for their future tasks in a management trainee programme.

At Kapsch TrafficCom AG, women are in particular supported through a flexible working hours scheme that is designed to help combine professional and private life. Kapsch TrafficCom cooperates with schools, universities

and universities of applied sciences in order to increase the proportion of women employed, among other goals. Kapsch TrafficCom AG also promotes women in the workforce through participation in specific programmes such as "FIT *Frauen in die Technik*" or "FemTech". A committee for non-discrimination has also been established within Kapsch TrafficCom AG.

### **Social responsibility**

Alongside statutory requirements and internal guidelines, the code of conduct of the Kapsch Group defines binding principles for ethically, morally and legally correct behavior that apply to all corporate units – and therefore to all employees of Kapsch TrafficCom AG. The code of conduct can be found on the website [www.kapsch.net](http://www.kapsch.net).

Additionally, within the scope of internal risk management, all business units over which Kapsch TrafficCom AG has primary influence are audited with regard to their corruption risks, and the employees of the first and second management levels are trained in anti-corruption policy and anti-corruption processes.

In accordance with the corporate values, Kapsch TrafficCom AG accepts social responsibility that extends even beyond its scope of operation and that is widely organised by the Kapsch Group. Only a selection of supported projects and initiatives are presented below.

### **Educational institutions**

Technical educational institutions are very important to Kapsch as a technology- and innovation-oriented group. The Company is therefore interested in establishing contact as early as possible with students as well as graduates of technical education programmes. Alongside the Vienna University of Technology and the University of Applied Sciences Technikum Wien, the Kapsch Group has also subsidised Universitäre Gründerservice Wien GmbH since 2005. This organisation aids young entrepreneurs in transforming ideas into convincing business concepts.

### **Development support**

One example of the many social projects supported in Austria and abroad is the Institute for Cooperation in Development Projects (ICEP). The goal of this organisation is to fight poverty around the world through projects with dependable local partners in many countries. In addition, Kapsch TrafficCom AG provides funding to projects that promote the integration of marginalised groups through targeted measures, thereby contributing to social justice, positive social development and long-term safety and security.

### **Support for art and cultural institutions**

The entire Kapsch Group – headed by Kapsch AG – supports many contemporary art and cultural institutions and projects and even initiates its own projects in this sector.

The Kapsch Group has participated in a general partnership with the Vienna Concert Hall (Wiener Konzerthaus) since 1992 under the motto of "It is an art to make money. It is an obligation to spend money on art." The Vienna Concert Hall is an expert in regularly attracting new segments of the public with its unusual programmes without alienating long-term friends of the Concert Hall. The festival "Wien modern" – one of the most famous contemporary music festivals in the world has been supported since 1989.

In the area of visual arts, Kapsch is particularly interested in supporting artists who are still in need of wider recognition. Consideration is therefore given to young artists from Austria and abroad with sponsorship campaigns. The showcase project in this area is the art calendar that the Kapsch Group has published since 1994 and presents annually in late autumn, creating a high-profile platform for the artists.

## **Risk management**

Risk management has been positioned as a separate function within the finance department of Kapsch TrafficCom AG, focusing on project risk management and enterprise risk management (ERM).

Project risk management covers both external customer projects as well as internal development projects, beginning in the bid or initiation phase. Using institutionalised processes allows for an analysis of all relevant opportunities and risks pertaining to the group's projects, thereby providing the basis for the timely planning and implementation of risk-mitigating activities.

The enterprise risk management (ERM) analyses not only Kapsch TrafficCom AG's significant project-related risks but also strategic, technological, organisational, financial, legal and IT risks. Reports are sent to the executive board, the audit committee of the supervisory board and the first reporting level on a quarterly basis. The goal of the ERM approach is early identification, analysis and control of those risks which may significantly affect meeting the Company's strategic and operational objectives. The primary objective in this context is not to avoid risks but to deal with risks in a controlled and deliberate manner and to recognise and realise opportunities as they arise over time in order to make a valuable contribution to the management of the Company.

The material risks faced by the Group and the respective risk management measures are briefly explained below.

### **Industry-specific risks**

#### **Volatility of new orders**

A major portion of the net sales of Kapsch TrafficCom AG is generated in the Electronic Toll Collection (ETC) segment. This segment includes implementation projects of country-wide, regional or route-by-route toll systems as well as the technical and commercial operation of such systems. Awarding such projects, including the operation of the systems, is generally made based on tenders. The final placement of orders with Kapsch TrafficCom AG is thus subject to a series of uncertainties both within and outside the Company's sphere of influence. Tenders for such huge projects may, for example, be delayed or withdrawn based on political changes, as well as appeals or legal actions by unsuccessful bidders. There also is the risk that Kapsch TrafficCom AG is not successful in tenders for new projects due to technological, financial, formal or other reasons.

In the past, the net sales of Kapsch TrafficCom AG have been heavily influenced by the realisation of implementation projects in the ETC segment in the given fiscal year. In particular, significantly higher net sales were recorded in fiscal year 2010/11 (implementation of a electronic toll system in the South African province of Gauteng), and 2011/12 (implementation of a nationwide electronic truck toll collection system in Poland). In fiscal years 2012/13, 2013/14 as well as 2014/15, sizeable revenues were generated from the implementation of a nationwide electronic truck toll collection system in Belarus. This project also contributed significantly to the Company's net sales from implementation projects in fiscal year 2015/2016.

The ongoing development of new business areas compatible with the core business of Kapsch TrafficCom AG is aimed at increasing net sales as well as mitigating sales peaks and thus stabilising the sales development. Measures to achieve this target are an increasing geographic diversification, an increasing expansion of the customer and product portfolio as well as the sustained growth of the share of revenues generated by the operation, including the maintenance, of offered systems. In a first step, the technological and commercial operation of the systems is generally linked with the order to implement the system, after system has been implemented, revenues generated from this system may be planned in the longer-term and more efficiently. In the past fiscal years, revenue contribution from the implementation of projects with a smaller volume have also constantly increased. The Intelligent Mobility Solutions (IMS) segment made valuable contributions in this context.



### **Risks of project execution**

In connection with the installation of systems, Kapsch TrafficCom AG is usually contractually obligated to provide performance and time-limit guarantees. Since electronic toll collection systems and other intelligent transportation systems are frequently sophisticated and technologically complex systems that must be implemented within a strict timeframe, system and product defects and/or missed deadlines may occur. Unexpected project modifications, temporary lack of qualified personnel, quality defects, technical problems as well as performance problems of suppliers or consortium members may also have a negative impact on project schedules. The failure to meet contractually guaranteed performance levels or deadlines usually results in penalties and compensation for damages, sometimes also compensation for lost toll revenues. Significant deadline overruns also frequently trigger contractual clauses that enable clients to terminate contracts prematurely. A significant delay in a project, failure to achieve contractually guaranteed performance levels or even failure to implement a project would also reduce the chances of success in future tenders for systems. There is also the risk that Kapsch TrafficCom AG cannot execute projects in line within the set cost budgets. Due to the strong social opposition to toll systems that is sometimes encountered, the risk of a late or limited rollout of the toll systems also exists in some projects, which can have further consequences on payment flows and net sales with regard to the operation project.

Kapsch TrafficCom AG employs project management methods and project risk management procedures based on IPMA (International Project Management Association) standards in order to minimise such risks associated with projects.

### **Long-term contracts with public authorities**

In many cases, public agencies commission projects. Framework agreements and service contracts in connection with toll collection or traffic management projects may include terms and conditions that are not negotiable in a tender process and that may be disadvantageous to Kapsch TrafficCom AG. Some multi-annual contracts include challenging requirements with regard to the desired performance of the implemented systems, components and processes. These requirements can, if they are not achieved, result in significant penalties, damages or even contract termination. On the other hand, some contracts include substantial bonus payments for over-fulfilment of performance requirements. In the case of long-term contracts, the margins earned can also differ from the original estimates due to changes in costs.

Liabilities arising from contracts may include liabilities regarding customers' loss of profit, product liabilities and other liabilities. While Kapsch TrafficCom AG aims to include appropriate limitations to its liability in contracts, it is still impossible to guarantee that all contracts contain sufficient limitations to the Company's liability or that these limitations can be enforced under applicable law.

### **Strategic risks**

#### **Capacity for innovation**

The strong market position of Kapsch TrafficCom AG is, to a large extent, based on its ability to develop state-of-the-art, efficient and reliable systems, components and products. Kapsch TrafficCom AG is committed to a permanent and integrated innovation process. In order to maintain its already strong position in technology, Kapsch TrafficCom AG invests a considerable portion of its net sales in research and development activities. However, if the Company does not succeed in developing new systems, components and products in line with market requirements, this can be detrimental to its competitive position.

Since its capacity for innovation is based largely on technology, internal know-how and intellectual property, the global increase in product piracy and reverse engineering may have negative effects on the market position of Kapsch TrafficCom AG. In addition, any failure in successfully protecting these technologies may have a negative impact on the competitive position. Kapsch TrafficCom AG thus places great importance on the protection of technologies and the Company's internal know-how, e.g. through patents and non-disclosure agreements with the relevant contracting parties. However, it is also possible that newly developed systems, components, products or services could infringe on the intellectual property rights of third parties.

## **Acquisition and integration of companies as a part of the Company's growth**

One of the strategic objectives of Kapsch TrafficCom AG is to grow internationally both by organic means and through select acquisitions and joint ventures. In the implementation of this strategy, the Kapsch TrafficCom Group has acquired and integrated companies around the world. In the course of these acquisitions, a number of challenges remain in order to realise the desired synergies and objectives and to implement the expected opportunities arising from the acquisition of new technologies and market know-how.

## **Country risk**

The strong expansion of business activities in non-European countries has exposed Kapsch TrafficCom AG to heightened political risks in these countries. Significant and at present unforeseeable political changes can exert a major influence on the ability to implement or operate projects in these countries and can also affect the availability and accessibility of funds. There may also be interference with the property rights of Kapsch TrafficCom AG or complications regarding business practices and activities. Kapsch TrafficCom AG considers these risks in the assessment of such projects.

## **Financial risks**

### **Foreign exchange risk**

As a company operating around the globe, Kapsch TrafficCom AG maintains branches and subsidiaries in a number of countries outside the euro zone. Implementing projects outside the euro zone results in transaction risks due to potential exchange rate fluctuations that may be included in the consolidated financial statements as exchange rate gains or losses. Kapsch TrafficCom AG aims to hedge to the greatest possible extent or to avoid these transaction risks in the amount of the net currency positions of the individual projects. As the net currency position of the respective cash flows often cannot be estimated reliably, hedging the associated risks is only possible to a limited extent; the remaining currency rate risk is accepted and taken into account in the Company's planning. Kapsch TrafficCom AG is also subject to translation risk, as the financial statements of subsidiaries operating outside the euro zone are translated into euro, the Group's currency. Moreover, exchange rate changes that are detrimental in the long run may also result in a change in Kapsch TrafficCom AG's position vis-à-vis competitors if, for example, products and solutions the costs of which are based on the euro may no longer be offered at competitive prices outside the euro zone.

### **Interest rate risk**

Within the framework of project financing, variable interest rates are agreed on a regular basis with these rates being tied to market interest rates (Euribor, etc.). This exposes Kapsch TrafficCom AG to interest rate risks. Kapsch TrafficCom AG utilises appropriate financial instruments to hedge against interest rate risks when these risks are significant.

### **Liquidity risk**

Sufficient financial resources must be available to ensure that Kapsch TrafficCom AG can meet its payment liabilities at any time. Medium and long-term financing must be available in order to carry out large-scale projects, such as implementing a nationwide toll collection system, under agreed delayed payment terms from the client and for acquiring other companies. Additionally, implementing large-scale projects often requires the provision of significant bank guarantees to secure bid obligations (bid bonds) or to secure possible warranty claims (performance bonds).

In financing agreements, Kapsch TrafficCom AG is subject to the customary restrictions in terms of its business policy, e.g. when drawing additional loans, using assets as collateral or providing guarantees and/or warranties for third parties. The availability of financing and bank guarantees depends on market conditions as well as the financial position and results of operations of Kapsch TrafficCom AG. A lack of liquid assets (even if the Group is otherwise solvent), of financing or of bank guarantees can have an extremely adverse impact on the financial position and results

of operations of Kapsch TrafficCom AG.

Liquidity risk is managed by ongoing, group-wide financial and cash planning. Potential liquidity shortages can thus be identified and appropriate countermeasures be taken in due time.

#### **Credit risk**

Kapsch TrafficCom AG is exposed to the risk of non-payment by customers. Many of the key customers of Kapsch TrafficCom AG are public authorities, especially in connection with implementing and/or operating nationwide or regional toll collection and traffic management systems. Kapsch TrafficCom AG also increasingly acts as a subcontractor to third parties (cessionaires, general contractors, etc.) in public sector projects. The potential default risk varies depending on the volume of the order and, with regard to defaulting counterparties in large-scale projects may have a significant impact on the results of operations. On principle, such large-scale projects are ordered by public authorities. The credit ratings of new and existing customers are checked as needed and secured in line with the assessment of the default risk. In addition, Kapsch TrafficCom AG uses services offered by public authorities, e.g. Oesterreichische Kontrollbank (OeKB, Austria's main provider of financial and information services) to hedge against the default risk by using guarantees.

There is also a risk that the counterparties (including financial institutions assumed to have good credit ratings) of both original and derivative financial instruments cannot meet their payment obligations when due. A payment default or the recognition of impairment charges to receivables can be extremely detrimental to the financial position and results of operations of Kapsch TrafficCom AG.

#### **Personnel risk**

The success of Kapsch TrafficCom AG depends heavily on key personnel with many years of experience in the industry. Moreover, the Company's ability to recruit qualified staff, integrate them into the Company and retain them over the long-term is crucial. The loss of key personnel and difficulties in the recruitment of personnel may adversely affect the success of the Group.

Kapsch TrafficCom AG has implemented a number of attractive measures to counteract personnel risks, such as incentive schemes or employee development opportunities.

#### **Legal risks**

A variety of regulations and legal requirements must be observed in connection with participating in public tenders, implementing and operating toll collection and traffic management systems. Identifying and adhering to applicable legal regulations and requirements can result in considerable administrative and technical expense. The failure to meet regulations or official requirements can lead to severe penalties and can also reduce the possibility of (successfully) taking part in tenders or continuing with the given business activity.

With the expansion of the business activities into new regions and select new IMS business areas, the risk of patent infringement or the violation of intellectual property rights (IPR) tends to increase. Kapsch TrafficCom AG has implemented active intellectual property management as a separate function that may lead to financial damage due to law suits and court and/or settlement procedures. In order to avoid legal actions and court proceedings to the greatest possible extent, Kapsch TrafficCom AG for example monitors potential intellectual property rights infringements prior to entry into new markets or regions. However, it is not possible to fully prevent this risk.

#### **IT risks**

As a technology group, Kapsch TrafficCom AG is exposed to typical IT risks relating to security, confidentiality and availability of data. For this reason, Kapsch TrafficCom AG has implemented an IT risk management system designed according to the corporate risk and IT security application method (CRISAM) and has been certified pursuant to ISO 27001 (information security management). Kapsch TrafficCom AG is also certified according to ISO 20000 "IT service management" (similar to ITIL) for the operation of toll collection systems. The Company promotes the rollout of CRISAM as an IT risk management tool within the Group.

## **Opportunities**

The enterprise risk management approach of Kapsch TrafficCom AG not only addresses risks but also encompasses the regular identification, evaluation and management of opportunities. The goal of these efforts is to manage the strategic orientation of the product portfolio and market activities through the early identification of opportunities and to develop corresponding potential.

Market opportunities exist in geographic diversification as well as increasing expansion of the customer and product portfolio, driven in part by the following factors:

Due to the increasing financing requirements of infrastructure projects and the growing need to relieve state budgets, there exists an opportunity to develop new markets, especially in emerging and developing countries, as well as an opportunity to expand our activities into already tapped markets.

The global rise in traffic volumes and the associated impact on the environment and society open up opportunities in the area of traffic management because measures such as toll collection, road pricing and the establishment of environmental zones or access restrictions are increasingly being employed as controlling instruments of environmental and traffic policy. In both the ETC and ITS segments, this is creating opportunities to further develop and market the portfolio according to the new requirements.

The drive to increase the productivity of vehicles and vehicle operations as well as the rising comfort expectations of travelers also open up new opportunities for expanding the functionality of existing systems. In this context, opportunities exist to attract new customers outside of the public sector, such as in the area of fleet management or to offer new parking management concepts to public authorities as well as end customers.

## **Other opportunities**

Constant innovation, technical advancements and the acquisition of new technologies in the course of company acquisitions offer opportunities for Kapsch TrafficCom AG to improve the efficiency and performance of customer systems as well as to gain a technological edge over competitors with regard to the performance and functionality of the offered systems.

## **Summary assessment of the risk situation**

From the current perspective, no risks have been identified that might endanger Kapsch TrafficCom AG's position to continue as a going concern. Increasing geographic diversification and the continuous expansion of the product and solution portfolio with select new ITS solutions helped to broaden the business model of Kapsch TrafficCom AG without influencing the core business. This constantly reduces the risk concentration in some regions and individual large-scale projects.

## **Internal Control System (ICS) with regard to the accounting process**

Kapsch TrafficCom AG began analysing and documenting its existing internal control processes for financial reporting on an ongoing basis many years ago. The results obtained so far have been presented at the quarterly audit committee meetings to the supervisory board for assessment and discussion. The internal audit department ensures by audits particularly of the subsidiaries of Kapsch TrafficCom AG that a reliable and functioning control system is implemented.

In fiscal year 2015/16, as in the previous year, the group-wide uniform documentation of all controls was improved with a view to achieve the significant control objectives, and their compliance and efficiency was assessed by the internal audit department in the course of local on-the-spot audits. A standardised collection of information allows for an improved control of measures and serves as a basis for evaluating the efficiency of local ICS.

The Group IFRS Accounting Manual represents the cornerstone for financial accounting and reporting throughout the whole Kapsch Group. The manual is published and regularly updated by the Kapsch Group and contains the essential financial and reporting procedures based on the International Financial Reporting Standards (IFRS). Groupwide guidelines, work instructions and process descriptions represent another important pillar of the internal control system.

The central elements of the ICS process include regular verification of compliance with the institutionalised principle of

dual control and the segregation of duties as well as defined actions for monitoring the effectiveness and efficiency of operating activities, the reliability of financial reporting and the compliance with relevant legal regulations. The ICS guidelines of Kapsch TrafficCom AG follow the basic structure of the internationally recognised standards for internal control systems (COSO - Internal Control Framework of the Committee of Sponsoring Organizations of the Treadway Commission).

The supervisory board is kept informed of business developments by the executive board during regular meetings by way of consolidated presentations consisting of segment reporting, earnings development analyses with comparisons of current figures to figures from the budget and the previous period, forecasts, consolidated financial statements and developments in the number of employees and order inflow as well as select financial key performance figures.

In line with local requirements, the respective local management is responsible for the implementation and monitoring of the Internal Control System. The management of the individual subsidiaries is responsible to implement and design an appropriate internal control and risk management for the accounting process in line with the requirements of the respective company, and is also responsible for compliance with group-wide guidelines and provisions. In order to better support the management of the subsidiaries, the function of an ICS manager was established within the finance department of Kapsch TrafficCom AG. The duty of this function is to standardise and continuously improve the ICS for the entire Kapsch TrafficCom Group, to initiate improvement processes with regard to found weaknesses and to report periodically to the audit committee of the supervisory board.

#### **Disclosures pursuant to Section 267 UGB in conjunction with Section 243a (1) UGB**

The registered share capital of Kapsch TrafficCom AG amounts to EUR 13.0 million and is fully paid in. It is divided into 13.0 million no-par value ordinary bearer shares.

There are no restrictions relating to the exercise of voting rights or the transfer of shares.

As of 31 March 2016, approximately 36.7% of the shares of Kapsch TrafficCom AG were in free float. As of 31 March 2016, KAPSCH-Group Beteiligungs GmbH held approximately 63.3% of the shares. KAPSCH-Group Beteiligungs GmbH is a wholly-owned subsidiary of DATAX HandelsgmbH, whose shares are equally held by Traditio-Privatstiftung, ALUK-Privatstiftung and Children of Elisabeth-Privatstiftung, each a private foundation under the Austrian Private Foundation Act (Privatstiftungsgesetz). These are each attributable to members of the Kapsch family. As of 31 March 2016, no other shareholder held more than 10% of the voting rights in Kapsch TrafficCom AG. None of the shares convey special control rights.

There are no restrictions regarding the execution of voting rights by employees with a share in the Company.

There are no special provisions on the appointment and removal of members of the executive board and the supervisory board and no special provisions regarding the amendment of the articles of association of the Company.

Neither authorised capital nor conditional capital currently exists at the Company, which empowers the executive board to issue shares with the approval of the supervisory board and without (renewed) consideration by the annual general meeting.

There are no agreements that become effective when a public takeover offer for shares is launched.

There are no agreements between Kapsch TrafficCom AG and members of the executive board or the supervisory board or employees which become effective when a public takeover offer for shares in the Company is launched.

#### **4. Significant events after the balance sheet date**

On 1 April 2016, Kapsch TrafficCom AG acquired the Spanish part of the global transportation division of Schneider Electric, with this part having previously been operating under the Telvent Tráfico y Transporte brand. The acquisition of the leading supplier of real-time IT solutions and intelligent traffic systems for about

EUR 27 million expands the Kapsch portfolio and strengthens the market position with regard to intelligent mobility systems.

With a view to refinance the corporate bond and to finance future growth, Kapsch TrafficCom AG prepares a promissory note bond addressing institutional investors in the public market. It was distributed on 1 June 2016. This transaction is planned to be completed in the course of the first quarter of the fiscal year 17.

## 5. Outlook and targets

In fiscal year 2016/17, the share of Kapsch TrafficCom Transportation's contribution in the net sales and results of Kapsch TrafficCom AG will on the one hand be evident – including the integration costs – and on the other hand, the implementation of the newly awarded projects will also make an increasing contribution. This particularly pertains, amongst others, to the cross-border programme "CHARM".

Kapsch TrafficCom AG also expects decisions concerning further projects: A nationwide toll system is currently being re-tendered in Austria, the tender for a new toll system was launched in Bulgaria. The Czech contract will expire at the end of 2016, meaning that the further course of action of the Prague government is expected to be determined in the near future.

In the next years, the main focus will be on further developing the strategy. Kapsch TrafficCom AG plans to expand the portfolio to include intelligent mobility solutions in order to offer customers an extraordinary experience when using these solutions. Systems and data will increasingly be interconnected and vehicles will be connected with the environment. The acquisition of the transportation division of Schneider Electric represents a major step towards the city, as Kapsch TrafficCom AG wants to carefully integrate this division and thus contribute to the design of future smart cities.

Vienna, 8 June 2016



signed:  
Georg Kapsch  
Chairman of the executive board



signed:  
André Laux  
Member of the executive board



signed:  
Alexander Lewald  
Member of the executive board

# Statement of all Members of the Management Board.

Statement of all Members of the Management Board pursuant to Section 82 Para. 4 No. 3 BörseG (Austrian Stock Exchange Act)

We declare to the best of our knowledge that the financial statements give a true and fair view of the assets, liabilities, financial position and profit or loss of the parent company as required by the applicable accounting standards and that the management report gives a true and fair view of the development and performance of the business and the position of the company, together with a description of the principal risks and uncertainties the company faces.

Vienna, 8 June 2016



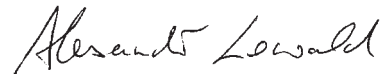
Mag. Georg Kapsch

Chief Executive Officer



André Laux

Chief Operating Officer



Dr. Alexander Lewald

Chief Technology Officer

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## **Additional information**

### **pursuant to Section 82 Para. 4 No. 3 BörseG. (Austrian Stock Exchange Act)**

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<b>Board member</b>	<b>Area of responsibility</b>
Georg Kapsch Chairman/ Chief Executive Officer	Finance, mergers & acquisitions, investor relations, compliance, strategy, legal, international subsidiaries & management systems, IT, human resources, marketing & public relations, baseline solution management, new ventures and sales region North America
André Laux Member/ Chief Operating Officer	All sales regions except for North America, production & logistics, supply chain management and delivery & operations
Alexander Lewald Member/ Chief Technology Officer	Engineering

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**Balance Sheet as of 31 March 2016**  
(Translation)

**Assets****Shareholder's Equity and Liabilities**

	31/3/2016	31/3/2015		31/3/2016	31/3/2015
	EUR	EUR '000		EUR	EUR '000
<b>A. Fixed assets</b>			<b>A. Shareholder's equity</b>		
I. Intangible assets			I. Share capital	13,000,000.00	13,000
1. Industrial property and similar rights and assets, and licenses in such rights and assets	9,366,598.35	2,371	II. Capital reserves		
2. Prepayments and construction in process	0.00	6,885	Appropriated	117,400,000.00	117,400
	9,366,598.35	9,256	III. Unappropriated retained earnings, thereof prior period unappropriated retained earnings brought forward	112,465,414.32	90,713
II. Tangible assets			EUR 84,212,695.41 (prior year: EUR 69,878k)		
1. Investments in leasehold buildings	1,780,732.74	2,218		242,865,414.32	221,113
2. Technical equipment and machinery	289,714.18	403			
3. Other equipment, factory and office equipment	1,571,638.80	1,919	<b>B. Investment grants</b>	543,533.48	288
4. Prepayments and construction in process	0.00	0			
	3,642,085.72	4,540			
III. Financial assets			<b>C. Accruals</b>		
1. Shares in affiliated companies	84,128,741.85	62,852	1. Accruals for severance payments	4,659,806.00	4,768
2. Loans to affiliated companies	45,436,149.07	44,192	2. Other accruals	17,959,642.53	15,776
3. Participating interests	17,649,952.78	17,550		22,619,448.53	20,544
4. Securities	4,375.00	5,004			
	147,219,218.70	129,598	<b>D. Accounts payable</b>		
	160,227,902.77	143,394	1. Bonds	70,818,000.00	75,000
<b>B. Current assets</b>			2. Bank loans and overdrafts	15,925,462.68	36,259
I. Inventories			3. Customer advances	154,798.00	77
1. Merchandise	4,978,032.44	6,323	4. Trade payables	2,015,759.91	2,116
2. Services not yet invoiced	3,037,142.42	842	5. Payables to affiliated companies	19,005,645.32	18,488
3. Prepayments	68,047.27	315	6. Other liabilities,	3,610,097.66	4,465
	8,083,222.13	7,480	of which taxes EUR 382,954.12 (prior year: EUR 900k),		
II. Receivables and other assets			of which social security payables EUR 664,934.10		
1. Trade receivables	7,843,395.09	7,373	(prior year: EUR 775k)		
2. Receivables from affiliated companies	135,234,177.29	180,314		111,529,763.57	136,405
3. Other assets	6,042,111.36	7,294			
	149,119,683.74	194,981			
III. Cash, bank balances	58,368,048.46	30,047			
	215,570,954.33	232,508			
<b>C. Prepaid expenses and deferred charges</b>	1,759,302.80	2,448			
	377,558,159.90	378,350		377,558,159.90	378,350

Contingent liabilities

216,405,748.39

198,134

**Income Statement for the Fiscal Year 2015/16**  
(Translation)

	2015/16	2014/15
	EUR	EUR '000
1. Net sales	140,014,602.31	144,671
2. Change in services not yet invoiced	2,195,223.22	-14,592
3. Other operating income		
a) Income from the retirement of fixed assets excluding financial assets	4,119.41	1
b) Income from the reversal of accruals	579,591.73	815
c) Other	10,276,840.98	21,118
	10,860,552.12	21,934
4. Cost of materials and purchased services		
a) Cost of materials	-12,501,064.67	-14,098
b) Cost of purchased services	-41,947,764.17	-34,103
	-54,448,828.84	-48,201
5. Personnel expenses		
a) Wages	-256,765.72	-205
b) Salaries	-28,633,077.38	-32,554
c) Expenses for severance payments and contributions to staff provision funds	-1,291,734.55	-1,588
d) Expenses for pensions	-73,750.00	-66
e) Expenses for statutory social security, payroll-relates taxes and mandatory contributions	-7,398,835.78	-8,679
f) Other social benefits	-262,666.71	-285
	-37,916,830.14	-43,377
6. Depreciation and amortization of fixed intangible and tangible assets	-2,258,436.38	-1,803
7. Other operating expenses		
a) Taxes not included in line 16	-474,681.65	-918
b) Other	-36,666,726.00	-39,950
	-37,141,407.65	-40,868
<b>8. Subtotal of lines 1 to 7 (Operating result)</b>	<b>21,304,874.64</b>	<b>17,764</b>
9. Income from participating interests, of which from affiliated companies EUR 11,045,972.57 (prior year: EUR 7,308k)	11,045,972.57	7,308
10. Other interest and similar income, of which from affiliated companies EUR 4,803,776.21 (prior year: EUR 5,627k)	4,945,995.31	5,643
11. Income from the retirement and write-up of fixed financial assets	334,756.23	76
12. Expenses on fixed financial assets, of which	-247,186.94	-893
a) Amounts written off EUR 0.00 (prior year: EUR 893k)		
b) Relating to affiliated companies EUR 0.00 (prior year: EUR 893k)		
13. Interest and similar expenses, of which relating to affiliated companies EUR 35,446.61 (prior year: EUR 73k)	-3,520,096.65	-4,093
<b>14. Subtotal of lines 9 to 13 (Financial result)</b>	<b>12,559,440.52</b>	<b>8,041</b>
<b>15. Net operating income</b>	<b>33,864,315.16</b>	<b>25,805</b>
16. Taxes on income, thereof recharged to group parent EUR 5,339,393.55 (prior year: EUR 4,689k)	-5,611,596.25	-4,970
<b>17. Net income for the year</b>	<b>28,252,718.91</b>	<b>20,835</b>
18. Prior period unappropriated retained earnings brought forward	84,212,695.41	69,878
<b>19. Unappropriated retained earnings</b>	<b>112,465,414.32</b>	<b>90,713</b>

## **Notes to the financial statements for fiscal year 2015/16** (Translation)

### **A. Accounting and valuation methods**

#### **1. General principles**

The financial statements as of 31 March 2016 have been prepared in accordance with the financial reporting requirements of the Austrian Commercial Code (UGB) as amended.

The financial statements, prepared under Austrian generally accepted accounting principles, present a true and fair view of the assets and liabilities, the financial situation of the Company, as well as its results of operations.

Accounting and valuation methods are based on generally accepted accounting principles. Section 201 (2) UGB was adhered to, as were the provisions on classification and valuation of balance sheet and income statement items under Sections 195 to 211 and 222 to 235 UGB. The income statement was prepared in accordance with the total expenditure format.

#### **2. Fixed assets**

Purchased **intangible assets** and **tangible assets** are valued at acquisition or production cost less scheduled straight-line amortization/depreciation charged according to the estimated useful life of the assets.

**Low-value fixed assets** with individual acquisition costs of less than EUR 400 were fully written off in the year of acquisition or production.

#### **Intangible assets**

Acquired IT software is amortized based on a useful life of between four to eight years.

### **Tangible assets**

Tangible assets were depreciated on a straight-line basis over the following useful lives:

	Years
Investments in leasehold buildings	2 - 12
Technical equipment and machinery	2 - 5
Other equipment, factory and office equipment	2 - 15

No unscheduled depreciation was charged in the fiscal year.

Additions to fixed assets are depreciated according to the date of their initial use.

### **Financial assets**

Financial assets are stated at acquisition costs or the lower market values at the balance sheet date. Write-downs / write-ups are made only in case a diminution / increase in value is expected to be permanent.

### **3. Foreign currency receivables and payables**

Foreign currency receivables are stated using the exchange rate at the date of the transaction or the lower bank buying rate at the balance sheet date.

Foreign currency payables are stated using the exchange rate at the date of the transaction or the higher bank selling rate at the balance sheet date.

### **4. Current assets**

Inventories and receivables were stated in accordance with the strict lower of cost or market principle.

#### **Inventories**

The stocks of purchased goods, recorded by means of electronic data processing, were stated using the moving average price method. Inventories denominated in foreign currencies were stated using the exchange rate at the date of acquisition. Where required, write-downs were made to the lower replacement costs.

A proportional deduction from acquisition or production cost was made for goods with diminished usability or marketability, which was derived from the respective inventory turnover ratio. In case of long-term contracts, no administrative and selling overheads were capitalized (option provided by Section 206 (3) UGB), directly attributable finance cost was capitalized depending on the project. At the balance sheet date, there are no services not yet invoiced for which finance cost was capitalized.

**Receivables**

Receivables were stated at nominal values. Identifiable risks were considered in the valuation of the individual receivables by write-offs. No-interest or low-interest receivables were discounted.

**5. Accruals**

The accruals were set up in accordance with the principle of prudence at the estimated amounts.

The accruals for severance payments and anniversary bonuses were calculated in accordance with IAS 19 using the projected unit credit method.

A discount rate of 1.75% (prior year: 2.1%) was used for the calculation of entitlements, and a percentage of 2.5% (prior year: 2.0%) was assumed for salary increases. Furthermore, the calculation was based on the earliest possible retirement age in accordance with the transitional statutory provisions and the mortality tables Pagler & Pagler AVÖ 2008-P (prior year: AVÖ 2008-P). Staff turnover rates were determined based on the period of service.

**6. Accounts payable**

In accordance with the principle of prudence, accounts payable were valued at the amount repayable.

**B. Comments on balance sheet items**

**Assets**

**Fixed assets**

Movements in fixed assets:

	Acquisition/Production cost				Balance 31/3/2016 EUR	Accumulated amortization/ depreciation EUR	Net book value		Amortization/ depreciation current year EUR
	Balance 1/4/2015 EUR	Additions EUR	Disposals EUR	Transfers EUR			Balance 31/3/2016 EUR	Balance 31/3/2015 EUR	
<b>I. Intangible assets</b>									
1. Industrial property and similar rights and assets, and licenses in such rights and assets	10,910,762.56	1,231,767.38	107,547.48	6,885,442.94	18,920,425.40	9,553,827.05	9,366,598.35	2,370,667.96	1,121,279.93
2. Prepayments and construction in process	6,885,442.94	0.00	0.00	-6,885,442.94	0.00	0.00	0.00	6,885,442.94	0.00
	17,796,205.50	1,231,767.38	107,547.48	0.00	18,920,425.40	9,553,827.05	9,366,598.35	9,256,110.90	1,121,279.93
<b>II. Tangible assets</b>									
1. Investments in leasehold buildings	5,022,139.02	36,699.54	0.00	0.00	5,058,838.56	3,278,105.82	1,780,732.74	2,217,659.91	473,626.71
2. Technical equipment and machinery	2,234,721.71	72,288.97	1,745.38	0.00	2,305,265.30	2,015,551.12	289,714.18	402,587.52	185,162.31
3. Other equipment, factory and office equipment	6,346,302.13	235,722.09	487,252.52	0.00	6,094,771.70	4,523,132.90	1,571,638.80	1,919,496.42	478,367.43
4. Prepayments and construction in process	0.00	57,506.77	57,506.77	0.00	0.00	0.00	0.00	0.00	0.00
	13,603,162.86	402,217.37	546,504.67	0.00	13,458,875.56	9,816,789.84	3,642,085.72	4,539,743.85	1,137,156.45
<b>III. Financial assets</b>									
1. Shares in affiliated companies	70,760,660.73	21,276,833.40	0.00	0.00	92,037,494.13	7,908,752.28	84,128,741.85	62,851,908.45	0.00
2. Loans to affiliated companies	44,191,722.17	1,299,182.66	54,755.76	0.00	45,436,149.07	0.00	45,436,149.07	44,191,722.17	0.00
3. Participating interests	17,549,659.73	100,784.99	491.94	0.00	17,649,952.78	0.00	17,649,952.78	17,549,659.73	0.00
4. Securities	5,004,419.99	0.00	5,000,044.99	0.00	4,375.00	0.00	4,375.00	5,004,419.99	0.00
	137,506,462.62	22,676,801.05	5,055,292.69	0.00	155,127,970.98	7,908,752.28	147,219,218.70	129,597,710.34	0.00
	168,905,830.98	24,310,785.80	5,709,344.84	0.00	187,507,271.94	27,279,369.17	160,227,902.77	143,393,565.09	2,258,436.38

**Financial obligations** of the Company from the use of tangible assets not recognized in the balance sheet amount to:

	In the following fiscal year		In the next 5 fiscal years	
	EUR	Prior year EUR '000	EUR	Prior year EUR '000
Obligations from rental and leasing agreements	6,394,795.78	6,024	19,452,033.74	19,219

### Shares in affiliated companies and shares in associates

#### Supplementary disclosures pursuant to Section 238 No. 2 UGB

Figures as of 31 March 2016	Share	Shareholders' equity	Result of fiscal year	FN
	%	EUR '000	EUR '000	
<b>a) Shares in affiliated companies</b>				
Kapsch TrafficCom AB, Jönköping, Sweden	100.00	20,011	4,285	1)
Kapsch TrafficCom Argentina S.A., Buenos Aires, Argentina	95.00	3,250	1,524	1)
Kapsch Components GmbH & Co KG, Vienna	100.00	8,277	2,083	1)
Kapsch Components GmbH, Vienna	100.00	108	5	1)
Kapsch TrafficCom B.V., Amsterdam, Netherlands	100.00	67,893	-42	1)
Kapsch Telematic Services GmbH, Vienna	93.00	17,929	17,855	1)
Kapsch TrafficCom Construction & Realization spol. s r.o., Prague, Czechia	99.00	1,350	832	1)
Kapsch TrafficCom S.r.l. a socio unico, Milan, Italy	100.00	305	-228	1)
Kapsch Telematic Technologies Bulgaria EAD, Sofia, Bulgaria	100.00	117	11	1)
Kapsch TrafficCom Ltd., Manchester, Great Britain	100.00	698	-102	1)
ArtiBrain Software Entwicklungsgesellschaft mbH, Vienna	100.00	43	-3	1)
Kapsch TrafficCom Russia OOO, Moscow, Russia	100.00	564	-423	1)
Kapsch TrafficCom d.o.o., Ljubljana, Slovenia	100.00	51	6	1)
Kapsch TrafficCom France SAS, Paris, France	30.19	177	48	1)
Electronic Toll Collection (PTY) Ltd., Centurion, South Africa	25.00	-20,791	-10,830	1)
Kapsch TrafficCom South Africa Holding (Pty) Ltd., Cape Town, South Africa	100.00	10,089	155	1)
Kapsch TrafficCom Kazakhstan LLC, Astana, Kazakhstan	100.00	54	10	1)
KTS Beteiligungs GmbH (formerly Jibesoev GmbH), Vienna	100.00	867	745	2)
Transport Telematic Systems LLC, Abu Dhabi, United Arab Emirates	49.00	67	4	1)
Kapsch Telematic Services IOOO, Minsk, Belarus	99.00	2,912	6,974	1)
Kapsch TrafficCom Lietuva, Vilnius, Lithuania	51.00	25	8	1)
Kapsch TrafficCom KGZ, Bischkek, Kyrgyzstan	100.00	10	4	1)
<b>b) Shares in associates</b>				
Q-Free ASA, Trondheim, Norway	19.26	44,240	-20,681	2)

1) Figures as of 31 March 2016

2) Figures as of 31 December 2015

In connection with the acquisition of 3% of the shares in Kapsch Telematic Services GmbH, Vienna, an outstanding variable purchase price component exists that depends on the earnings before interest and taxes (EBIT) of the KTS Group, net of non-controlling interests, of the fiscal years 2015-2018. This outstanding component amounts to a maximum of EUR 3.5 million (due for payment in July 2018 at the latest).

## Loans

Loans amounting to EUR 7,178,981.82 granted to affiliated companies have a residual term of less than one year.

## Current assets

### Inventories

Prepayments in the amount of EUR 0.00 (prior year: EUR 286k) relate to prepayments made to affiliated companies.

### Maturity of receivables

	31/3/2016		31/3/2015	
	Total	of which with a remaining maturity > 1 year	Total	of which with a remaining maturity > 1 year
	EUR	EUR	EUR	EUR
1. Trade receivables	7,843,395.09	0.00	7,373,314.82	0.00
2. Receivables from affiliated companies	135,234,177.29	24,340,225.40	180,313,783.97	81,276,047.71
3. Other assets	6,042,111.36	0.00	7,293,882.00	0.00
	149,119,683.74	24,340,225.40	194,980,980.79	81,276,047.71

Receivables from affiliated companies pertain to trade receivables in the amount of EUR 92,357,840.73 (prior year: EUR 103,944k), loan receivables in the amount of EUR 36,848,288.23 (prior year: EUR 70,041k) and dividend receivables in the amount of EUR 6,028,048.33 (prior year: EUR 6,329k).

Other assets mainly include research bonuses, receivables from fiscal authorities, accrued receivables and other assets.

Other assets include income in the amount of EUR 5,911,238.44 (prior year: EUR 7,125k) that will affect cash flow only after the balance sheet date.



## Shareholders' equity and liabilities

### Investment grants

Kapsch TrafficCom AG, Vienna, received an investment grant from the lessor for the adaptation of the new location at Euro Plaza. The grant is related to the following items of fixed assets:

	Balance 1/4/2015	Utilization	Balance 31/3/2016
	EUR	EUR	EUR
Leasehold improvements	288,025.22	76,890.76	211,134.46

### Accruals

Other accruals include the following items:

	31/3/2016 EUR	31/3/2015 EUR '000
Invoices not yet received as well as outstanding project costs and risks	12,488,755.66	9,371
Personnel accruals (including vacation accruals of EUR 1,794,691.96; prior year: EUR 2,328k)	4,772,638.82	4,308
Warranties and liabilities for construction flaws, as well as production and system defects	328,753.05	367
Sundry accruals	369,495.00	1,730
	<u>17,959,642.53</u>	<u>15,776</u>

## Accounts payable

### Maturity of payables

	31/3/2016			31/3/2015		
	Total	remaining maturity < 1 year	remaining maturity > 1 year	Total	remaining maturity < 1 year	remaining maturity > 1 year
	EUR	EUR	EUR	EUR	EUR	EUR
1. Bonds	70,818,000.00	0.00	70,818,000.00	75,000,000.00	0.00	75,000,000.00
2. Bank loans and overdrafts	15,925,462.68	15,925,462.68	0.00	36,258,795.96	21,758,795.98	14,499,999.98
3. Customer advances	154,798.00	154,798.00	0.00	76,573.00	76,573.00	0.00
4. Trade payables	2,015,759.91	2,015,759.91	0.00	2,115,985.13	2,115,985.13	0.00
5. Payables to affiliated companies	19,005,645.32	19,005,645.32	0.00	18,488,046.95	18,488,046.95	0.00
6. Other liabilities	3,610,097.66	3,610,097.66	0.00	4,465,258.64	4,465,258.64	0.00
	111,529,763.57	40,711,763.57	70,818,000.00	136,404,659.68	46,904,659.70	89,499,999.98

There are no accounts payable with a remaining maturity of more than 5 years.

In November 2010, Kapsch TrafficCom AG issued a corporate bond with a volume of EUR 75,000,000.00, a maturity of 7 years and a fixed coupon of 4.25% per annum. In May 2015, the bond was repaid early in a nominal value of EUR 4,182,000.00.

Payables to affiliated companies pertain to trade payables with the exception of tax compensation in the amount of EUR 5,339,393.55 (prior year: EUR 5,214k) and a loan in the amount of EUR 0.00 (prior year: EUR 3,132k).

Other liabilities include expenses in the amount of EUR 3,200,806.75 (prior year: EUR 3,551k) that will affect cash flow only after the balance sheet date.

### Collateral securities

The export promotion loan recognized in the amount of EUR 1,425,462.56 is secured by bill of exchange.

In connection with the project financing for Belarus with an outstanding loan in the amount of EUR 14.5 million as of 31 March 2016, the Company received a guarantee by aval from Oesterreichische Kontrollbank Aktiengesellschaft (OeKB) as well as a participation guarantee G4 from OeKB. Claims arising from the participation guarantee G4 were assigned as security to the lending banks.

**Contingent liabilities**

	31/3/2016 EUR	31/3/2015 EUR
Assumption of liabilities on behalf of subsidiaries	65,149,671.49	51,988,284.43
Bank guarantees for the performance of contracts relating to major projects	41,221,782.53	38,747,373.41
Payment guarantees	449,011.00	548,342.81
Project performance guarantees for subsidiaries	109,056,040.73	106,243,413.76
Other guarantees (security deposits, bid bonds and sureties)	529,242.64	606,591.70
	<u>216,405,748.39</u>	<u>198,134,006.11</u>

In addition, Kapsch TrafficCom AG, Vienna, provided performance bonds for export transactions and projects of Kapsch TrafficCom AB, Jönköping, Sweden, in a contract value of EUR 43.5 million (prior year: EUR 43.2 million).

A letter of subordination exists vis-à-vis Electronic Toll Collection (PTY) Ltd., Centurion, South Africa, relating to loan and trade receivables in the amount of EUR 22,983,392.08. In addition, a letter of comfort was issued for Electronic Toll Collection (PTY) Ltd., Centurion, South Africa, providing for additional financial support.

**Derivative financial instruments**

At the balance sheet date, the Company has no derivative financial instruments that would result in any obligation.

**C. Comments on income statement items**

In the course of a strategy project, the Kapsch TrafficCom Group decided to change the structure and the related corporate control in the fiscal year 2015/16. As a result of this project, the Company created two divisions, Electronic Toll Collection (ETC) and Intelligent Mobility Solutions (IMS).

**Breakdown of net sales**

By field of activity:	2015/16 EUR	2014/15 EUR '000
Electronic Toll Collection (ETC)	128,441,166.96	140,657
Intelligent Mobility Solutions (IMS)	11,573,435.35	4,014
	<u>140,014,602.31</u>	<u>144,671</u>

<b>By region:</b>	<b>2015/16</b> EUR	<b>2014/15</b> EUR '000
Domestic	25,727,554.90	26,940
European Union	64,219,268.81	61,258
Foreign	50,067,778.60	56,473
	<u>140,014,602.31</u>	<u>144,671</u>

**Expenses for severance payments and contributions to staff provision funds include the following:**

	<b>2015/16</b> EUR	<b>2014/15</b> EUR '000
Expenses for severance payments	953,425.19	1,189
Contributions to staff provision funds	338,309.36	399
	<u>1,291,734.55</u>	<u>1,588</u>

#### **Expenses for the auditor**

Expenses for the auditor amount to EUR 192,957.00 (prior year: EUR 199k) and are broken down as follows:

	<b>2015/16</b> EUR	<b>2014/15</b> EUR '000
Audit of the financial statements	52,740.00	52
Other assurance services	83,010.00	68
Other services	57,207.00	79
	<u>192,957.00</u>	<u>199</u>

#### **Taxes on income**

- a) The option to capitalize deferred tax assets on temporary differences between the business result and tax result was not used. The capitalizable amount pursuant to Section 198 (10) UGB amounts to EUR 130,924.67 (prior year: EUR 1,430k), of which EUR 87,837.09 (prior year: EUR 267k) is classified as short-term.
- b) The Company is member of a tax group, parent of the tax group is KAPSCH-Group Beteiligungs GmbH, Vienna. In accordance with Section 9 (1) KStG (Austrian Corporate Income Tax Act), the relevant tax result of the respective group member is allocated to the relevant tax result of the participating group member or the group parent in the respective fiscal year. Pursuant to Section 7 (2) KStG, the income is determined at the group parent based on the consolidated result of the group and taxed. Tax is allocated using the stand-alone method.

## **D. Other disclosures**

### **Disclosures on share capital**

The registered share capital of the Company amounts to EUR 13,000,000.00. The share capital is fully paid in. The total number of shares issued is 13,000,000. The shares are no-par value bearer shares.

### **Authorized capital**

The authorized capital amounts to EUR 0 as of 31 March 2016 (prior year: EUR 0k).

### **Group relations**

The Company is a 63.279% subsidiary of KAPSCH-Group Beteiligungs GmbH, Vienna, and thus is related to its shareholder and its affiliated companies as a group company.

DATA X HandelsgmbH, Vienna, prepares the consolidated financial statements for the largest group of companies. These consolidated financial statements are deposited at the Commercial Court Vienna.

The Company prepares the consolidated financial statements for the smallest group of companies.

With regard to the disclosure on the legal and economic relations with affiliated companies, the protection-of-interest clause pursuant to Section 241 (3) UGB was used.

### **Disclosures on board members and staff**

The average number of staff during fiscal year 2015/16 was 455, including 429 salaried employees and 26 waged workers (prior year: 525 salaried employees, 27 waged workers).

In fiscal year 2015/16, total remuneration of the management board amounted to EUR 1,276,074.13 (prior year: EUR 1,114k), expenses for severance payments and pensions for managing directors amounted to EUR 31,534.13 (prior year: EUR 24k).

With regard to supervisory board members, remuneration (including travel expenses) in the amount of EUR 122,080.37 (prior year: EUR 46k) was recognized as expenses.

The following persons served on the management and supervisory board:

**Management Board**

Georg Kapsch (Chairman)  
André Laux  
Alexander Lewald (since 1 November 2015)

**Supervisory Board**

Franz Semmernegg (Chairman)  
Kari Kapsch (Deputy Chairman)  
Sabine Kauper  
Harald Sommerer

delegated by the Works Council:

Christian Windisch  
Martin Gartler

Vienna, 8 June 2016

The Management Board:




signed:

Georg Kapsch



signed:

André Laux



signed:

Alexander Lewald

We draw attention to the fact that the English translation of this auditor's report according to Section 274 of the Austrian Commercial Code (UGB) is presented for the convenience of the reader only and that the German wording is the only legally binding version.

## Auditor's Report

### Report on the Financial Statements

We have audited the accompanying financial statements of Kapsch TrafficCom AG, Vienna, which comprise the balance sheet as of 31 March 2016, the income statement and the notes for the fiscal year then ended.

#### *Management's Responsibility for the Financial Statements*

Management is responsible for the preparation and fair presentation of these financial statements in accordance with the Austrian Commercial Code, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

#### *Auditor's Responsibility*

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Austrian generally accepted auditing standards. Those standards require the application of the International Standards on Auditing according to which we are to comply with ethical requirements and to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Company's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

*Opinion*

Our audit did not give rise to any objections. In our opinion, the financial statements comply with legal requirements and give a true and fair view of the financial position of the Company as of 31 March 2016 and of its financial performance for the fiscal year then ended in accordance with the Austrian Commercial Code.

**Comments on the Management Report**

Pursuant to statutory provisions, the management report is to be audited as to whether it is consistent with the financial statements and as to whether the other disclosures are not misleading with respect to the Company's position. The auditor's report also has to contain a statement as to whether the management report is consistent with the financial statements.

In our opinion, the management report is consistent with the financial statements.

Vienna, 8 June 2016

PwC Wirtschaftsprüfung GmbH



Peter Pessenlehner  
Austrian Certified Public Accountant

Disclosure, publication and duplication of the financial statements together with the auditor's report according to Section 281 (2) UGB in a form not in accordance with statutory requirements and differing from the version audited by us is not permitted. Reference to our audit may not be made without prior written permission from us.



**Kapsch TrafficCom** is a provider of intelligent transportation systems (ITS) in the segments of toll collection, traffic management, safety and security, smart urban mobility and connected cars. The end-to-end solutions of Kapsch TrafficCom cover the entire value creation chain of its customers as a one-stop shop, from components and design to the installation and operation of systems. The core business comprises the development, installation and operation of electronic toll collection and traffic management systems. References in 44 countries on all continents have made Kapsch TrafficCom a globally recognized ITS provider. As part of the Kapsch Group, an Austrian family-owned technology group founded in 1892, Kapsch TrafficCom is headquartered in Vienna, Austria, and has subsidiaries and branches in 30 countries. It has been listed since 2007 on the Vienna Stock Exchange (KTCG) and generated revenues of EUR 526 million in the fiscal year 2015/16 with over 3,700 employees.

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# Annual Financial Statements Fiscal year 2014/15.

always one step ahead

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# Management Report.

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## Kapsch TrafficCom AG on the Consolidated Financial Statements as of 31 March 2015.

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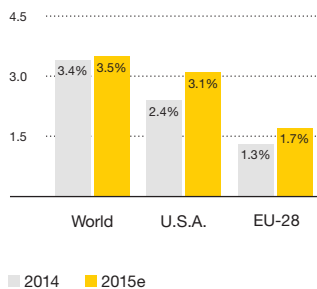
### 1 Economic climate.

#### 1.1 General economic situation

##### Global economy

The global economy expanded by 3.4 % in 2014 just as in the previous year. While the first half of the year was characterized by reserved growth, the international economy clearly picked up speed in the months that followed. The economic developments in the individual regions varied highly. While the economies of the U.S.A. and Great Britain gained momentum and the emerging markets and developing economies continued their solid performance, other regions lagged significantly behind expectations. A significant economic downturn was observed in the Commonwealth of Independent States (CIS), and Japan even suffered a slight decline in total economic production. In the euro zone, economic developments improved in comparison with 2013 but still remained largely weak. The International Monetary Fund (IMF) predicts global economic growth of 3.5 % for 2015, although the individual economic regions will continue to develop very differently. Risks for the global economy include uncertainties on the financial markets, geopolitical crises and price volatility on the commodities markets.

##### GDP growth (in %)



Source: IMF World Economic Outlook

##### U.S.A.

The U.S. economy expanded in 2014 by 2.4 % following 2.2 % in the year 2013. Especially in the second half of the year, the economy was boosted by high consumer spending and investment. The significantly reduced unemployment rate as well as rising real income and improved corporate balance sheets will further promote future growth in the U.S.A. Against this background, the IMF expects a growth rate of 3.1 % for 2015. The stronger U.S. dollar does represent a challenge, since it could lead to a reduction in net exports.

##### Emerging Markets and Developing Economies

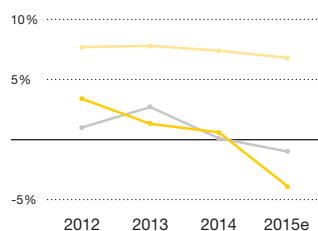
The economies of the emerging and developing countries definitely lost momentum.

The economies of this group of countries have gradually lost some momentum over recent years. Economic growth declined in 2014 to 4.6 %, down from a 5.0 % rate of expansion in 2013 and 7.5 % in 2010.

The economy of the Commonwealth of Independent States came under increasing pressure in 2014 from the ongoing Russia-Ukraine conflict and the drastically fallen oil price. GDP growth slowed to 1.0 % after the previous year saw the economy expand by 2.2 %. Russia achieved a GDP growth of only 0.6 % in 2014 due to flight of capital, worse refinancing options for Russian banks on the international capital market and weak oil prices. The heavily damaged trust in Russia as a business location alongside international sanctions and the drop in the oil price can be expected to further intensify the already precarious economic situation. In addition, falling real income is dampening private consumption.

## GDP growth 2012-2015

(in %)



■ Russia  
■ China  
■ Brazil

Source: IMF World Economic Outlook

Asia remained the most rapidly expanding economic region in the world with GDP growth in 2014 of 6.8% (after 7.0% in the previous year). In China, however, the economy clouded over in response to declining consumption, softening of the real estate boom and lower investment. The growth rate declined from 7.8% in the previous year to 7.4%. A further cooldown in investment activity can be expected, leading to a growth forecast of only 6.8%. Economic developments also lost some momentum in the ASEAN-5 region (Indonesia, Malaysia, Thailand, the Philippines and Vietnam).

Growth-inhibiting trends dominated in Latin America (including the Caribbean), resulting in economic growth of only 1.3% after 2.9% growth in the previous year. While countries such as Brazil, Argentina and Venezuela had to accept significant slowdowns in some cases due to falling commodity prices, lower foreign demand and structural problems, the economies of Central America benefited from impulses coming out of the U.S.A.

Muted growth was also observed in sub-Saharan Africa, while the MENAP region (Middle East, North Africa and Pakistan) was able to slightly improve on its macroeconomic performance of the previous year: After GDP growth of 2.4% in 2013, economic output grew in 2014 by 2.6%. For 2015, the IMF predicts growth of 2.9%.

## Europe

Economic developments in Europe were characterized by a weak dynamic in 2014. GDP growth in the EU-28 was only 1.3%. Major factors here included the Russia-Ukraine conflict, curbed global trade, low industrial production and the threat of a deflation spiral. Nevertheless, positive developments were also seen in individual countries. The economy of Great Britain expanded strongly again for the first time in years at 2.6%. Spain and Portugal also declined additional international assistance on the basis of clear indications of an upswing. Even crisis-plagued Greece exhibited slight GDP growth after six years of recession. Prospects are good for a stronger expansion of the European economy in 2015. In concrete terms, the economic output of the EU-28 is expected to increase by 1.7%.

In the euro zone, measures were taken to stimulate the economy.

The economy of the euro region recovered more slowly than the EU overall in 2014, with economic output rising by only 0.8%. In contrast to the year before, this is not attributable to the tense situation in peripheral states but rather to the weak growth in the core countries of the currency union. Against this backdrop, the European Central Bank passed a number of measures in 2014 for promoting the flow of credit into the real economy. Alongside these monetary measures, the economy should also profit from a new EU-wide investment initiative.

The economic developments in Central and Southeastern Europe also lagged behind expectations in 2014. The main causes for this lie in subdued demand from the large economies in the euro zone and the conflict between Russia and Ukraine. A heterogeneous picture can be seen in the individual countries. While relative strong growth was observed in Poland (+3.3%), the Czech Republic (+2.0%), Slovakia (+2.4%) and Hungary (+3.5%), the Balkan countries were confronted with economic downturns as a result of structural problems and catastrophic floods in spring 2014. With regard to 2015, only moderate growth is expected for Central and Southeastern Europe.

## Austria

Austria recorded GDP growth of only 0.3% in 2014.

Compared with Europe in general, the economic dynamic in Austria was weak in 2014. The gross domestic product increased by only 0.3% over the previous year. For 2015, economists predict only a slight acceleration of growth to 0.5%. Foreign trade may supply some positive momentum here. Specifically, real growth in goods exports should grow since the depreciation of the euro against the dollar primarily has a positive impact on the competitiveness of the domestic export business outside of Europe.

## 1.2 Development of the market for intelligent transportation systems (ITS)

Kapsch TrafficCom addresses the market for intelligent transportation systems (ITS).

Kapsch TrafficCom addresses the market for intelligent transportation systems (ITS). ITS employ information and communication technologies to support and optimize road transportation, including infrastructure, vehicles, users and industry.

### Market segmentation

The study "Intelligent Transportation Systems – A global strategic business report" from Global Industry Analysts, April 2014, describes the ITS market as a diversifying market with widely differing application and product segments. Thus, the market comprises the following three product segments:

The ITS market comprises three product segments

**Electronic toll collection (ETC)** enables drivers to pay toll fees without stopping at toll stations.

**Traffic management systems (TMS)** monitor traffic, optimize signal timing and regulate the flow of traffic.

**Other intelligent transportation systems (OTH)** comprise in particular

- ▶ Commercial vehicle operations (CVO) encompassing systems for operating commercial vehicles in order to enhance freight carrier productivity and safety,
- ▶ Public vehicle transportation management systems (PVTMS) facilitating management of both local and long-distance public transportation, and
- ▶ Advanced vehicle information systems (AVIS) transmitting traffic-related vehicle information to travelers before or during the trip or provide navigation services.

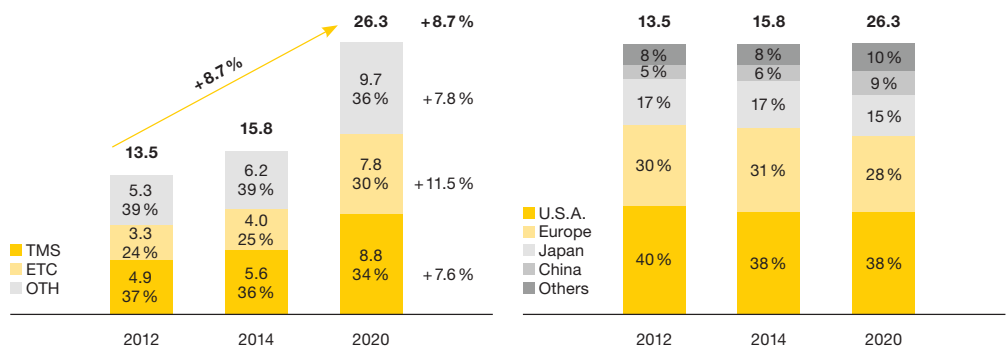
### Market volume and growth

The global volume of the ITS market is estimated at USD 15.8 billion in 2014.

Global Industry Analysts (April 2014) estimated that the global volume of the ITS market amounted to USD 15.8 billion in 2014 and is expected to continue growing. The largest product segment in 2014 was OTH, accounting for 39.2% (USD 6.2 billion). Based on a worldwide volume of about USD 4.0 billion, ETC had an ITS market share of 25.3%. The largest geographic region for ITS in 2014 was the U.S.A. at 38.3%, followed by Europe at 30.6%.

The ITS market is expected to grow at an average annual rate of 8.7% between 2012 and 2020 to reach a global volume of USD 26.3 billion in 2020, of which ETC will account for USD 7.8 billion, equaling a share of 29.5% and thereby exhibiting the fastest growth of all product segments at an average annual rate of 11.5%.

Global ITS market by product segment and by geographic regions (in USD billion)

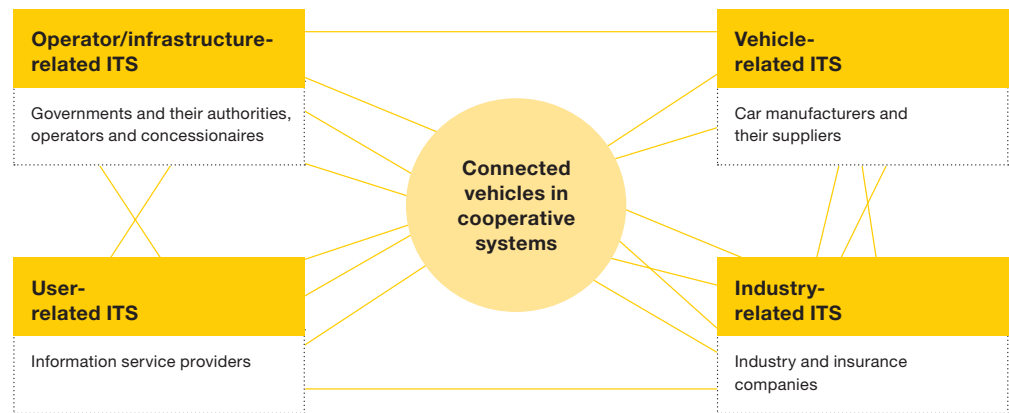


The past three years have shown that trends on the ITS market have arisen – in part due to economic conditions – that significantly influenced the developments. Due to a lack of current studies, it is difficult to estimate how much the actual market volume deviates from these forecasts from the year 2012.

### Customer segments

Kapsch TrafficCom divides the ITS market into customer segments and the primary addressees

Kapsch TrafficCom has developed its own understanding and view of the ITS market in order to define and develop its own market positioning. From this perspective, the ITS market was divided into four customer segments and the corresponding primary addressees were identified.



The current focus aims at the operator/ infrastructure-related segment of the ITS market.

**Operator/infrastructure-related ITS** encompasses both ETC and TMS as well as applications for urban access and parking. The addressees are governments and their authorities, road and toll operators as well as concessionaires, that develop transport policies using ITS to ensure the availability and quality of the infrastructure in a way that improves safety, performance, security and environmental protection.

**Vehicle-related ITS** aims at in-car telematics such as remote diagnostics or driver assistance systems (AVIS). They are intended mainly to enhance vehicle productivity, particularly that of commercial vehicles (CVO), as well as traffic safety and security. Addressees are mainly car manufacturers and their suppliers. This field also includes systems for real-time interaction between vehicles (vehicle-to-vehicle; V2V) as well as between vehicles and infrastructure (vehicle-to-infrastructure; V2I), collectively abbreviated as V2X, which Kapsch TrafficCom believes will be based on 5.9GHz technology.

**User-related ITS** focuses mainly on convenience and efficiency for travelers. The customer in the car receives information to aid in orientation during the journey, thereby increasing traffic safety. Example applications for advanced vehicle information systems (AVIS) include transmitting traffic-related vehicle information to travelers before or during the trip as well as navigation services. Addressees are information service providers such as mobile network operators, radio broadcasters and vendors of portable navigation devices.

**Industry-related ITS** encompasses commercial applications designed to reduce the costs or maximize the yield of vehicle fleet operators, including public transportation companies (PVTMS). Example applications include systems for fleet management and for collecting information on the logistics of large-scale vehicle operators. Among the addressees are insurance companies, who see pay-as-you-drive car insurance as a promising way to attract new customers by offering fair insurance rates and ITS-based value-added mobility services.

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Kapsch TrafficCom intends to be a leading provider in the future area of “V2X” as well.

### Market positioning

The current focus of Kapsch TrafficCom aims at the operator/infrastructure-related segment of the ITS market. The goal is to become a leading provider of solutions and technologies in the future field of “Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication – V2X”. With this, Kapsch TrafficCom intends to offer solutions at both the infrastructure and vehicle levels, supplying the information and communication technologies as well as designing, building and operating select applications. The future focus will therefore also be on vehicle-related and user-related ITS, and the ongoing developments in industry-related ITS will be monitored as well.

### Market situation and market drivers

Kapsch TrafficCom believes that the following six factors are the main drivers for the market which it currently addresses:

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The market is influenced by economic as well as environmental and social aspects.

**Funding for infrastructure projects.** The worldwide increase in number of cars and the growing road traffic as a consequence of the global population growth require additional financing to construct new and maintain existing roads. Toll collection offers a constant source of income and thus helps to provide the necessary funding for infrastructure projects. Efficient toll collection systems, especially electronic ones, offer a significant, constant and sustainable source of additional funds for governments and their authorities, road and toll operators as well as concessionaires that can be used for the expansion and maintenance of road infrastructure.

**Urbanization.** The urbanization is the second megatrend next to the global population growth driving the ITS market in the view of Metalan Research. In large conurbations and capital cities, there is a growing need for electronic systems to control and reduce traffic. Toll collection is largely perceived as an effective solution for reducing high levels of congestion, as mandatory payments for road usage encourage carpooling or the use of public transportation. Systems for city charging and enforcing low-emission environmental zones are deployed by cities to reduce traffic congestion and environmental pollution. Traffic safety devices to monitor compliance with traffic regulations are another field of ITS applications in cities. Examples include systems to monitor traffic violations at junctions (e.g. running red lights).

**Reducing congestion and further environmental pollution caused by road traffic.** Efforts to reduce environmental pollution caused by road traffic have become a market driver for the introduction of toll collection systems. Such systems encourage reduced or modified vehicle usage, thereby lowering emissions and pollution levels. Electronic toll collection systems, in particular for multi-lane free-flow traffic, have proven their ability to decrease environmental pollution and carbon dioxide emissions by reducing congestion at toll plazas without interfering with the traffic flow.

**Increasing traffic safety and security.** Governments and their authorities, road and toll operators as well as concessionaires, are particularly engaged in improving the availability and quality of traffic infrastructure in a way that increases safety and security. Traffic management systems (market segment TMS) lower accident rates while also helping increase the probability of surviving accidents.

**Enhancing vehicle and fleet productivity.** Car manufacturers and their suppliers are aimed at enhancing vehicle productivity, particularly that of commercial vehicles. In addition, cost reduction and yield increase are becoming more and more important in the operation of vehicles. Vehicle-oriented ITS are aimed at in-car telematics such as remote diagnostics or advanced driver assistance systems (market segment CVO). Their purpose is mainly to enhance vehicle productivity as well as traffic safety and security. Commercial applications of vehicle operations including public vehicle transportation (market segment PVTMS) support fleet management and collect information on the logistics of large-scale vehicle operators.



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**Increased comfort expectations of travelers.** Greater convenience and efficiency for users generally also means higher traffic safety. Model applications include vehicle information systems that forward traffic-relevant data to the vehicle driver before and during travel as well as navigation services. Information service providers such as mobile network operators, radio broadcasters and vendors of portable navigation devices are all interested in the further development of such systems. The 5.8 GHz technology will enable as a communication platform multiple future applications in the connected car.

### **Technology**

Depending on the requirements of the specific application, systems are used for toll collection which are based on microwave technology (dedicated short-range communication; DSRC), satellite navigation (global navigation satellite system; GNSS), or video technology using automatic number plate recognition (ANPR). While in Europe the DSRC technology is predominantly based on 5.8 GHz according to the Comité Européen de Normalisation (CEN) standard, electronic toll collection systems in North America are based on proprietary protocols in the 915 MHz band. In addition to the toll application, the communication standard 5.9 GHz WAVE (Wireless Access in the Vehicular Environment) is intended for real-time vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication.

### **Convergence on the ITS market**

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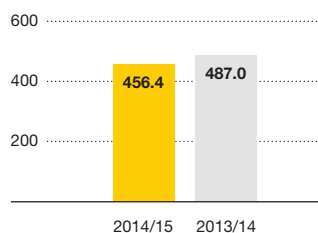
The product and customer segments of the ITS market are increasingly merging with the incremental convergence

A common thread among all these market drivers and technologies is a convergence on the ITS market. Kapsch TrafficCom has realized that product and customer segments are becoming increasingly interconnected in view of future solutions and is convinced that applications, platforms and technologies will finally converge. In the view of Kapsch TrafficCom, the future lies in the interaction between vehicles (vehicle-to-vehicle; V2V) and vehicle to infrastructure (vehicle-to-infrastructure; V2I). The driving forces in this convergence are governments and the automotive industry.

## 2 Economic situation of the Kapsch TrafficCom Group.

### 2.1 Business development

**Revenue decline of 6.3 %**  
(in million EUR)



In the 2014/15 fiscal year, the Kapsch TrafficCom Group achieved a revenue of EUR 456.4 million, a 6.3 % decline compared to the previous year. The segment of Services, System Extensions, Component Sales (SEC) accounted for 81.6 % (previous year: 68.1 %) of the revenue as the recurring portion of the business. The segment Road Solution Projects (RSP), which represents the project business, contributed a lower share of revenue than in the previous year at 13.2 % (previous year: 27.1 %). The revenue in the segment Others (OTH) amounted to 5.2 % of total revenue in the 2014/15 fiscal year (previous year: 4.8 %). In addition to existing major projects in Belarus, France and the U.S.A. that shaped the 2014/15 fiscal year, the following new projects were acquired as well as project progress made and partnerships formed:

- ▶ On 1 April 2014, Kapsch TrafficCom and Autofind Industrial signed an agreement for a strategic partnership for joint sale of end-to-end solutions for the SINIAV system (Sistema de Identificação Automática de Veículos) in Brazil.
- ▶ In April 2014, Kapsch TrafficCom concluded framework agreements for the delivery of on-board units for electronic toll collection to Chile, Denmark, France and Spain. These framework agreements cover the delivery of roughly three million on-board units of the newest generations within the next four years.
- ▶ Since 1 July 2014, the manual toll processing has been handled by the local Kapsch TrafficCom company in Poland. This led to an increase of overall profitability.
- ▶ On 21 July 2014, Kapsch TrafficCom was awarded an order by the New York State Thruway Authority for the development, installation and technical support of an all-electronic tolling (AET) system. Because the toll collection will take place without a reduction in speed, the AET system will contribute to the unobstructed flow of traffic and help minimize traffic jams on the multi-lane roadways. The resulting vehicle emissions reduction has a direct positive impact on the environment. The order value amounts to USD 18.6 million (roughly EUR 13.7 million), and the system is expected to go into operation in the first quarter of 2016.
- ▶ On 9 December 2014, Kapsch TrafficCom was contracted to deliver a toll system to the WestConnex Delivery Authority (WDA). The order encompasses an electronic toll system with 14 tolling points on 41 lanes with a total of 14 toll bridges in Sydney, Australia.

The following official changes and events took place in the fiscal year 2014/15:

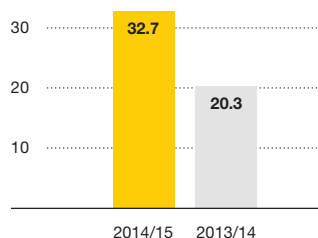
- ▶ On 27 August 2014, the new company Kapsch TrafficCom KGZ, Bishkek, Kyrgyzstan, was founded.
- ▶ On 10 September 2014, Kapsch TrafficCom Lietuva, Vilnius, Lithuania, was founded jointly with a local partner.
- ▶ On 31 March 2015, KTCSL Merger Corp., Delaware, U.S.A., was founded.

### 2.2 Earnings situation

**The revenue** of the Kapsch TrafficCom Group reached EUR 456.4 million in the fiscal year 2014/15, which is 6.3 % below the previous year's value of EUR 487.0 million.

**The operating result (EBIT)** of the Kapsch TrafficCom Group was EUR 32.7 million, which exceeds the previous year's EBIT by 61.5 % (EUR 20.3 million). The EBIT margin was 7.2 % (previous year: 4.2 %).

**EBIT increase of 61.5 %**  
(in million EUR)



The postponement of new large projects had a negative impact on the segment RSP.

**Revenue and operating result (EBIT) by segment**

The segment reporting of the Kapsch TrafficCom Group is split between the three segments of Road Solution Projects (RSP), Services, System Extensions, Components Sales (SEC) and Others (OTH).

**Road Solution Projects (RSP).** Projects for the installation of toll systems are included in this segment. These are generally projects awarded based on invitations to tender by public agencies or private concessionaires. The systems cover either individual road sections or nationwide road networks.

*The segment RSP contains the one-time effects from the realization of projects.* The project nature of this segment results in fluctuations in revenue, material costs and production expenses, staff costs and other operating expenses. Some projects also include project financing costs. Revenue and operating results differ greatly from period to period, depending on whether individual projects are in the preparation, starting or implementation phase.

*In fiscal year 2014/15, revenue decreased by 54.4 % to EUR 60.2 million (previous year: EUR 132.0 million). The largest revenue contributions during the reporting period came from the implementation project in Belarus and the managed lane system project in Texas, U.S.A.; however, these were significantly below the comparison value of the previous year due to the advanced stages of completion. In the managed lane system project in the U.S.A., 22 out of a total of 29 toll stations have been successfully put into operation, and Kapsch TrafficCom has been commissioned with an expansion by 10 additional stations. In Belarus, phase 2b with a length of 256 km was put into operation on schedule in August 2014. The revenue contributions of the GNSS (Global Navigation Satellite System) project in France and the M5 South Western Motorway project in Sydney, Australia, were also below those of the previous year due to the high level of completion already in the previous year. The projects obtained in fiscal year 2014/15 in New Zealand (Tauranga) and the U.S.A. (New York State Thruway Authority) as well as the projects of the company KTC USA Inc., U.S.A., acquired in January 2014 (formerly Transdyn, Inc., U.S.A.), also supplied significant revenue contributions.*

*The EBIT of the segment RSP was EUR -50.7 (previous year: EUR -34.6 million). The decline in the EBIT associated with this segment is due to the lower revenue contributions. In consequence, it was also not possible to sufficiently cover the expenditures for development and preparatory work for potential tenders as well as expenditures for ongoing tenders attributed to this segment. In addition, the EBIT of the segment was weighed down in the second quarter by a goodwill impairment to the cash-generating unit "Road Solution Projects, Electronic Toll Collection" in the amount of EUR 12.3 million. The results were improved by the release of a provision in the amount of EUR 16.1 million on 30 September 2014 due to changed circumstances.*

**Services, System Extensions, Components Sales (SEC).** After installation, Kapsch TrafficCom generally also takes over the technical operation of the systems, including maintenance. Additional deliveries of components, such as on-board units and transponders, transceivers and readers as well as cameras also frequently take place for the expansion or adaptation of existing systems or for upgrading from manual to automated or electronic toll systems. Since 2005, Kapsch TrafficCom has also offered the commercial operation of systems. All of these activities focused on continuous income are allotted to the SEC segment.

*The segment SEC encompasses the recurring portion of the business.* It is characterized by relatively stable revenue over certain periods since the associated services are generally provided on the basis of medium- or long-term service and framework agreements.

The revenue and EBIT of the segment SEC profited from the contributions of the operation projects in South Africa and Belarus.

In fiscal year 2014/15, revenue increased by 12.3% to EUR 372.6 million (previous year: EUR 331.8 million). The operation project in the Gauteng province, South Africa, that was started in the third quarter of the previous year as well as the technical and commercial operation project in Belarus, which went into operation in the second quarter of the previous year, contributed significantly to the increase in revenues. The technical and commercial operation of the nationwide system in the Czech Republic, the technical and commercial operation project in Poland and the technical operation including maintenance of the nationwide system in Austria continued to provide stable revenue. An expansion to the toll system in Poland also enhanced revenue during the reporting period.

The number of on-board units sold was below the level of the previous year at 7.4 million units (previous year: 9.2 million units). It should be noted here that the initial delivery for the nationwide toll project in Belarus took place in the comparison period of the previous year. Lower sales volumes were observed in North America during the reporting period. In contrast, the volume sold in France, Russia and Australia increased, and on-board units were also sold to Norway for the first time.

The EBIT of the segment SEC was EUR 82.2 million (previous year: EUR 53.8 million), which put the EBIT margin at 22.1% (previous year: 16.2%). This positive development compared with the same period of the previous year was due in part to the fact that the operation projects in Belarus and South Africa contributed for the entire reporting period of twelve months. In addition, a solution for compensation of a portion of the costs arising from maintaining the operational readiness of the system was reached with the customer of the South African project in the second quarter. This one-time effect amounts to EUR 5.6 million. The nationwide technical and commercial operation project in the Czech Republic, the technical and commercial operation project and ongoing expansions in Poland and the technical operation project including maintenance of the nationwide system in Austria continued to supply stable profit contributions.

**Others (OTH).** The segment Others contains the non-core business, which is handled by the subsidiary Kapsch Components GmbH & Co KG as well as the company KTC USA Inc., U.S.A., which was acquired in the previous year. This business includes engineering solutions, electronic manufacturing and logistics services for affiliated companies and outside customers as well as solutions, systems and services for operational monitoring of public transportation and environmental systems used for the operation of subway and railroad networks as well as waste water treatment plants.

In the segment OTH, revenue and EBIT increased.

In fiscal year 2014/15, revenue increased by EUR 2.1% to EUR 23.6 million (previous year: EUR 23.1 million). This increase can be largely attributed to the non-ETC- and non-ITS-related revenue of KTC USA Inc., U.S.A. The production and deliveries for the GSM-R projects of Kapsch CarrierCom also supplied additional revenue contributions.

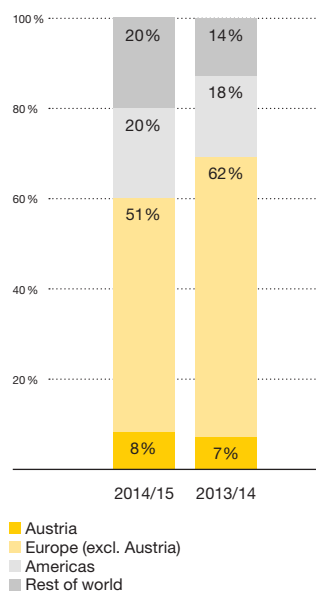
The EBIT of the segment OTH was EUR 1.3 million (previous year: EUR 1.1 million). This placed the EBIT margin at 5.4% (previous year: 4.7%).

The segment SEC contributed 81.6% to the total revenue.

Revenues by segment		2012/13	2013/14	+/-	2014/15
<b>Road Solution Projects (RSP)</b>					
Revenues (share of total revenues)	in million EUR	128.3 (26%)	132.0 (27%)	-54%	60.2 (13%)
EBIT	in million EUR	-51.7 (-40.3%)	-34.6 (-26.2%)	-47%	-50.7 (-84.4%)
<b>Services, System Extensions, Components Sales (SEC)</b>					
Revenues (share of total revenues)	in million EUR	342.3 (70%)	331.8 (68%)	12%	372.6 (82%)
EBIT	in million EUR	67.3 (19.7%)	53.8 (16.2%)	53%	82.2 (22.1%)
<b>Others (OTH)</b>					
Revenues (share of total revenues)	in million EUR	18.3 (4%)	23.1 (5%)	2%	23.6 (5%)
EBIT	in million EUR	0.9 (5.1%)	1.1 (4.7%)	17%	1.3 (5.4%)

## Revenues by region

(in %)



A goodwill impairment of EUR 12.3 million was recognized under depreciation and amortization expenses.

An impairment of EUR 18.5 million was recognized under finance costs as a loss.

## Revenues by region

The largest share of the total revenue came once again in the 2014/15 fiscal year from the region of Europe at 51.3%, although it declined by EUR 66.1 million EUR (-22.0%), primarily due to lower revenue in Belarus and France. Sales in the Americas increased by EUR 5.6 million (+6.4%). This can be attributed largely to revenue contributions from projects of KTC USA Inc., U.S.A., which was acquired in the previous year, and the project progress in implementation of the New York State Thruway Authority project. Expansion projects in Chile further contributed to increased revenue. Sales in the rest of the world increased by EUR 24.6 million (+36.6%). Higher revenue in South Africa and implementation projects in Australia and New Zealand factored into this rise. In Austria, revenue increased over the previous year by EUR 5.3 million (+16.2%) on the strength of deliveries for the GSM-R projects of Kapsch CarrierCom.

## Main positions of the consolidated statement of comprehensive income

**The cost of material and other production services** declined by EUR 60.0 million to EUR 168.0 million (previous year: EUR 228.0 million). Compared with the previous year, the share of costs for materials and other production services with respect to sales revenue therefore fell from 46.8% to 36.8%. The release of the provision for losses from pending transactions and rework in the amount of EUR 16.1 million was included in this item.

**Staff costs** increased by EUR 8.9 million to EUR 148.1 million (previous year: EUR 139.2 million). At the same time, the average number of employees grew by 338 persons, changing from 3,172 to 3,510 in the reporting period. Compared with the previous year, the staff cost ratio (staff costs in relation to total revenue) increased from 28.6% to 32.5%.

The implementation of the measures for improving profitability (Program 2020) resulted in the planned savings at the parent companies. In contrast, the year-round staff costs of the previous year acquired KTC USA Inc., U.S.A., the assumption of external temporary staff at the South African company ETC Pty and the further expansion of the operation companies in Poland and Belarus combined to produce an overall increase in staff costs.

**Depreciation and amortization expenses** remains stable amounting to EUR 16.4 million (previous year: EUR 16.6 million).

**The impairment charge** is directly associated with the goodwill impairment in the cash-generating unit "Road Solution Projects, Electronic Toll Collection" in the amount of EUR 12.3 million.

**Other operating expenses** rose by EUR 2.5 million to EUR 94.8 million (previous year: EUR 92.3 million). Higher IT and communication expenditures were also recorded, while savings were achieved in marketing and advertising costs as well as licensing and patent fees.

**The financial result** improved from EUR -14.9 million in the previous year to EUR -13.1 million. The finance income increased due to compounding of the receivables from the installation of the Belorussian toll system as well as not yet realized foreign exchange gains.

Due to the continued negative share price developments for the interest in Q-Free ASA, an impairment of EUR 18.5 million was recognized under finance costs as a loss. This amount comprises net losses from exchange rate fluctuations in previous periods (up to 31 March 2014) already recorded previously in equity under other comprehensive income in the amount of EUR 9.5 million and exchange rate losses incurred in fiscal year 2014/15 in the amount of EUR 9.0 million. Foreign currency gains and foreign currency losses resulting from the conversion of the group-internal financing of the subsidiaries in North America and South Africa by the parent company burdened financial result to a lower extent than in previous financial year.

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**The profit from joint ventures and associated companies** was almost unchanged from the previous year at EUR 0.2 million (previous year: EUR 0.2 million) and resulted from the share in Simex, Integración de Sistemas, S.A.P.I. de C.V., Mexico.

**The profit before taxes** increased by EUR 14.4 million to EUR 19.9 million (previous year: EUR 5.5 million).

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The profit per share was positive at EUR 0.28.

**The profit for the period** improved by EUR 8.6 million to EUR 11.4 million EUR (previous year: EUR 2.9 million), of which EUR 3.6 million (previous year: EUR -4.3 million) is attributable to the equity holders of the company. The profit per share was therefore positive again at EUR 0.28 (previous year: EUR -0.33).

### 2.3 Assets and liabilities

**The balance sheet total** decreased by EUR 51.2 million to EUR 515.6 million at the close of the period on 31 March 2015 (31 March 2014: EUR 566.8 million).

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The equity ratio improved by 5 percentage points.

**The equity** increased by EUR 6.3 million to EUR 219.4 million (previous year: EUR 213.1 million). As a result, the equity ratio of the Kapsch TrafficCom Group improved from 37.6 % on 31 March 2014 to 42.5 % on 31 March 2015.

**The largest change in assets** concerns the non-current assets. Other non-current assets decreased by EUR 43.0 million. This is mainly due to the contractually agreed repayment from the Belorussian installation project over a period of 36 months, beginning in August 2013 and the resulting shift from non-current to current trade receivables. The intangible assets declined by EUR 18.3 million, largely due to the goodwill impairment in the amount of EUR 12.3 million. Under current assets, the trade receivables and other current assets fell by EUR 4.3 million and the inventories by EUR 10.4 million, largely as a result of the project business.

**The largest changes in the liabilities** occurred in the area of non-current financial liabilities, which decreased by EUR 20.5 million due to repayment of the financing for construction of the nationwide electronic truck toll system in Belarus. The largest changes in the current liabilities resulted from the decrease in current provisions by EUR 19.2 million, primarily due to the release of the provision for losses from pending transactions and follow-up work in the amount of EUR 16.1 million. The decline in trade payables by EUR 18.9 million arose directly from the project business.

### 2.4 Financial position

**The net cash flow from operating activities** amounted to EUR 75.2 million (previous year: EUR -10.9 million). This increase can be attributed to the decrease in current and non-current receivables and assets as well as the good operating result; the decline in trade liabilities and the release of the provision exerted an opposing influence here.

**Net cash flow from investment activities** amounted to EUR -7.4 million and relates largely to investments in the expansion of IT hardware, investments in modernization of the office building and replacement investments. The improvement in net cash flow from investment activities by EUR 18.4 million resulted from the previous year's acquisition of KTC USA Inc., U.S.A., and the associated intangible assets.

**The free cash flow** developed extraordinarily well and was positive at EUR 68.2 million (previous year: EUR -24.7 million).

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**The net cash flow from financing activities** was EUR -31.9 million (previous year: EUR 18.9 million) due to the decline in non-current financial liabilities.

**Cash and cash equivalents** reached a record level of EUR 96.8 million on 31 March 2015 (31 March 2014: EUR 57.7 million). The decrease in non-current financial liabilities and the increase in cash and cash equivalents led to a decline in net debt from EUR -93.4 million on 31 March 2014 to EUR -35.9 million on 31 March 2015.

### 3 Additional company information.

#### 3.1 Research and development

The Kapsch TrafficCom Group has a global network of research and development centers in Vienna and Klagenfurt (Austria), Jonkoping (Sweden), Bologna (Italy), Buenos Aires (Argentina), Mississauga (Canada), Kingston (U.S.A.), Duluth (U.S.A.) and Cape Town (South Africa). On 31 March 2015, Kapsch TrafficCom employed roughly 400 engineers (previous year: roughly 470) for its research and development activities.

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The development departments for all strategic business fields ensure strong innovation.

Research and development (R&D) are a high priority for Kapsch TrafficCom with respect to achieving its strategic goals. To ensure the inventiveness of the company, development departments exist for all strategic business fields to work on new solutions for customer needs.

The following focal areas were defined in the past fiscal year:

In the back office area, completion of the development of standardized platforms has the highest priority. Additional functionality has been implemented and successfully tested for the use of video tolling in a load scenario.

Investments continue to be made in improving vehicle identification and classification sensors, which are integrated into the inexpensive single-gantry roadside system. The new generation of sensors and infrared lighting increase the measurement accuracy to meet the constantly rising expectations of the market.

In connection with the requirements of the Italian market, Kapsch TrafficCom started an evaluation and prototype development project for DSRC components (on-board unit and transceiver) to enable the communication also with the special Italian radio standard ETSI-HDR.

The completion of the first satellite-based toll system with ITS functionality in France is a milestone for Kapsch TrafficCom that adds an important component to the portfolio. This success is based on cooperation between the development locations in Sweden and Austria as well as intensive collaboration with the customer, who is also offering its customers a new feature with this GNSS-based (Global Navigation Satellite System) toll system.

In order to safeguard the existing 5.8GHz portfolio, it is essential to cover this business field also with other technologies. With the new RFID (Radio Frequency Identification) platform according to ISO 18000-6C, Kapsch TrafficCom can also address markets in which RFID sticker tags have already become established or are explicitly in demand. This allows Kapsch TrafficCom to select the specific technology that is best suited to the requirements of the customer. The RFID-MLFF platform expands the solution portfolio for tolling and registration applications to include RFID standard components from third-party providers that already implement ISO

For the traffic management solutions, the Kapsch TrafficCom Group made significant improvements to the user experience. In particular, an innovative feature set for the management of reversible lanes has been implemented. The operation of this life-safety critical roadway function is now enhanced by an “auto-sweep” feature that automatically verifies a clear roadway as part of the overall process for reversing lane direction. With architectural upgrades the performance, scalability and usability of the product are improved.

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To meet the increasing interest in V2X solutions, the Kapsch TrafficCom is cooperating in multiple projects with other companies and institutions in Europe. In addition to defining application scenarios for V2X communication as well as their implementation and evaluation, Kapsch TrafficCom is also taking an active part in the required standardization process in the U.S.A. and in Europe. The focus lies on building an end-to-end solution from the traffic control center to the vehicle, as was already successfully presented at the ITS World Congress 2014 in Detroit, U.S.A. The efforts in the area of in-vehicle equipment are concentrated on solutions for connected vehicles in connection with V2X technology. Participation in some research projects in cooperation with the automotive industry led to close contact with leading original equipment manufacturers (OEM) and first tier automotive suppliers.

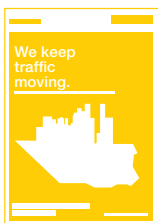
In the fiscal year 2014/15, the Kapsch TrafficCom Group invested roughly EUR 49.0 million in research and development (previous year: roughly EUR 57.8 million), which corresponds to about 11 % (previous year: about 12%) of total revenues.

### 3.2 Non-financial performance indicators

#### Sustainability management

Kapsch TrafficCom sees itself as particularly committed to the central aspects of sustainability not least due to the business model of the company. The focus lies on achieving the efficient and sparing use of resources of all kinds, securing the profitability and innovative strength and ensuring equal opportunities and fairness with respect to all relevant interest groups. Securing the long-term stability of the company in consideration of all economic, environmental and social perspectives is the overarching goal.

**Consistent sustainability orientation.** Kapsch TrafficCom understands sustainability as a continuous process. In recent years, the company has begun systematizing all the related agendas. One important milestone was reached with the publishing of the third sustainability report in May 2015, which is available at [www.kapsch.net/ktc/investor\\_relations](http://www.kapsch.net/ktc/investor_relations).



Sustainability report 2013/14

The sustainability report satisfies the requirements of the Global Reporting Initiative, GRI Guideline G3.1 (Application Level C). It also serves as a progress report for the United Nations Global Compact, which defines ten principles for protecting human rights and labor standards as well as environmental protection and fighting corruption.

The report provides comprehensive information about the central fields of action:

- ▶ Protecting the environment, conserving resources and actively protecting the climate
- ▶ Securing the innovative strength
- ▶ Product responsibility and quality assurance
- ▶ Ensuring the competitiveness and profitability
- ▶ Integrity and compliance
- ▶ Attractive and responsible employer
- ▶ Social responsibility

Figures for success measurement as well as goals for the following period have been defined for each field of action. All such agendas are coordinated by a sustainability officer and reported to the executive board.



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An impressive 11 % of the total revenue is invested in research and development.

### **Innovative products with added value for the environment and society**

The products and solutions for intelligent transportation systems from Kapsch TrafficCom make valuable contributions to climate protection. They allow road users to reach their destinations quickly, efficiently and with low environmental impact. In order that these ambitions can be realized in the future, Kapsch TrafficCom invests heavily in research and development – in fiscal year 2014/15, and spent roughly 11 % (previous year: approximately 12 %) of the total revenue in this area.

Comprehensive guidelines were created to ensure that environmental, economic, social, health and safety aspects are ideally taken into account in a structured fashion in the design of products. The contents of these guidelines must be integrated into the specifications and project invitations to tender.

**Quality.** Safeguarding the high standards of quality, safety and robust processes is a high priority in all units of the Kapsch TrafficCom Group. Kapsch TrafficCom AG defines its processes in an integrated HSSEQ management system (Health, Safety, Security, Environment, Quality). This system is based on certifications according to ISO 9001 Quality Management (since 2002) as well as OHSAS 18001 Occupational Health and Safety Management and ISO 14001 Environmental Management (since 2005). Kapsch TrafficCom has anchored the necessary measures for ensuring the associated standards into its internal processes and continuously monitors compliance. The certificate according to ISO 27001 defines the required information security management. A high service quality is ensured in the area of technical operation with ISO 20000 for IT service management. The HSSEQ Circle meets once per quarter to discuss the status of the goals and measures from the areas of health and safety, quality, the environment and information security and to optimize work processes and information sharing. These aspects are documented in a quarterly report to the executive board.

**Reliability and accuracy of installed systems.** The toll transaction rate is a figure for assessing the accuracy and reliability of a toll collection system. It indicates the number of successful transactions in relation to all potential toll transactions of vehicles equipped with a functioning on-board unit. A high toll transaction rate translates to high toll income.

*The average toll transaction rate* of the existing truck toll collection system in Austria was at approximately 99.89 % in 2014 (2013: 99.83 %), the average transaction rate of the nationwide electronic toll collection system in the Czech Republic was approximately 99.6 % 2014 (2013: 99.6 %). The calculation of the average transaction rate is based on methods agreed upon with the respective customer, meaning that comparisons between the average transaction rates achieved in different projects are only possible on a limited basis.

### **Protecting the environment, conserving resources and actively protecting the climate**

The business activities are associated with the consumption of raw materials and the emission of climate-relevant emissions. Kapsch TrafficCom works intensively on minimizing these impacts. The majority of the climate-relevant effects result from the business activities of the subsidiary Kapsch Components, which is responsible for production as well as the fleet of the entire group. Through measures to increase energy efficiency, but also influenced by a lower production volume, Kapsch Components was able to reduce its energy consumption by 0.7 % in fiscal year 2013/14 following a reduction of 5 % in the previous year. The waste volume per ton of product was reduced by 13.5 % to 135 kilograms and the nitrogen consumption by 5.1 %.

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### Ensuring the necessary team competence

**Staff.** The average number of employees in the Kapsch TrafficCom Group in fiscal year 2014/15 was 3,510, which is 11 % higher than the average of 3,172 in fiscal year 2013/14. As of 31 March 2015, the group had a workforce of 3,545 (3,349 salaried and 196 non-salaried employees), of which more than half were located outside of Europe – roughly 1,400 employees in South Africa only.

*Training and education.* Kapsch TrafficCom places great importance on the continued training and education of its employees. This involves not only promoting professional education but also providing seminars and workshops for developing personal and teamwork skills. In addition, training sessions tailored to the particular needs of employees are offered within the framework of the Kapsch Academy. A job rotation program promotes the international exchange of staff between various locations, and selected employees are prepared for their future tasks in a management trainee program.

*Pension fund.* Kapsch TrafficCom makes contributions to an external pension fund for employees of group companies in Austria under a defined contribution scheme. The amounts of the payments are based on the individual employee's income and the operating profit margin of the company.

*Profit participation.* Kapsch TrafficCom is aware of the employees' contribution to its success and acknowledges this through a profit participation plan. The Kapsch TrafficCom Group rewards the commitment of its employees by distributing to them up to 5 % of the group profit before income taxes. Country-specific upper limits have been established to ensure that the distribution reflects local purchasing power. Every employee receives a share, which is independent of the person's salary or wage and limited to EUR 1,500 per employee.

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Promoting opportunities for women is an active goal both in the company and within the scope of special programs.

*Advancement of women.* Kapsch TrafficCom is committed to promoting the advancement of women in the workplace. Women are supported through a flexible working hours scheme that is designed to help combine professional and private life. In addition, Kapsch TrafficCom cooperates with schools, universities and universities of applied sciences in order to increase the proportion of women employed, among other goals. The company also promotes women in the workforce through participation in specific programs such as "FIT Frauen in die Technik" or "FemTech". A committee for non-discrimination has been established within the Kapsch TrafficCom Group.

### Social responsibility

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Social responsibility begins with ethically, morally and legally correct actions.

**The framework.** Alongside statutory requirements and internal guidelines, the code of conduct of the Kapsch Group defines binding principles for ethically, morally and legally correct behavior that apply therefore to all corporate units – and therefore to all employees of Kapsch TrafficCom. The code of conduct can be found on the website [www.kapsch.net](http://www.kapsch.net).

Additionally, within the scope of internal risk management, all business units over which Kapsch TrafficCom AG has primary influence are audited with regard to their corruption risks, and the employees of the first and second management levels are trained in anti-corruption policy and anti-corruption processes.

In accordance with the corporate values, the Kapsch TrafficCom Group accepts social responsibility that extends even beyond its scope of operation and that is widely organized by the Kapsch Group. Only a selection of supported projects and initiatives are presented below.

**Educational institutions.** Technical educational institutions are very important to Kapsch as a technology- and innovation-oriented group. The company is therefore interested in establishing contact as early as possible with students as well as graduates of technical education programs. Alongside the Vienna University of Technology and the UAS Technikum Wien, the Kapsch Group has also subsidized the Universitäre Gründerservice Wien GmbH since 2005. This organization aids young entrepreneurs in transforming ideas into convincing business concepts.

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The success of Kapsch TrafficCom is influenced by economic as well as environmental and social aspects.



Art Calendar  
2015

**Development support.** One example of the many social projects supported in Austria and abroad is the Institute for Cooperation in Development Projects (ICEP). The goal of this organization is to fight poverty around the world through projects with dependable local partners in many countries. In addition, Kapsch TrafficCom provides funding to projects that promote the integration of marginalized groups through targeted measures, thereby contributing to social justice, positive social development and long-term safety and security.

**Support for art and cultural institutions.** The entire Kapsch Group – headed by Kapsch AG – supports many contemporary art and cultural institutions and projects and even initiates its own projects in this sector.

The Kapsch Group has participated in a general partnership with the Vienna Concert Hall (Wiener Konzerthaus) since 1992 under the motto of “It is an art to make money. It is an obligation to spend money on art.” The Vienna Concert Hall offers plenty of space for all culture of high quality. Unusual programs regularly interest new segments of the public without alienating long-term friends of the Concert Hall. The festival “Wien modern” – one of the most famous contemporary music festivals in the world has been supported since 1989.

In the area of visual arts, Kapsch is particularly interested in supporting artists who are still in need of wider recognition. Consideration is therefore given to young artists from Austria and abroad with sponsorship campaigns. The showcase project in this area is the art calendar that the Kapsch Group has published since 1994 and presents annually in late autumn to great fanfare.

### 3.3 Risk Management

Risk management has been positioned as a separate function within the finance department of Kapsch TrafficCom AG, focusing on project risk management and enterprise risk management (ERM).

**Project risk management** analyzes beginning in the bid phase of customer projects in institutionalized processes all relevant opportunities and risks pertaining to the group's projects, thereby providing the basis for the timely planning and implementation of risk-mitigating activities.

**The enterprise risk management (ERM)** analyzes not only the risks of key customer projects but also strategic, technological, organizational, financial, legal and IT risks, and reports them to the executive board and the audit committee of the supervisory board on a quarterly basis. The goal of the ERM approach is early identification, analysis and control of all risks which might influence strategic and operational objectives of the company. The primary objective in this context is not to avoid risks but to deal with risks in a controlled and deliberate manner and to recognize and realize opportunities as they arise over time in order to make a valuable contribution to the management of the company.

The material risks faced by the Kapsch TrafficCom Group and the respective risk management measures are briefly explained below.

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Risk management entails the analysis of risks and opportunities.

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The approach of Kapsch TrafficCom aims to reduce the revenue volatility.

### Industry-specific risks

**Volatility of new orders.** A major portion of the revenues of the Kapsch TrafficCom Group is generated in the segment Road Solution Projects (RSP). In this segment, the group regularly participates in tenders for the implementation and operation of large electronic toll collection systems as well as for the collection of tolls on specific road sections as well as for tenders for other solutions from the ITS portfolio. On the one hand, there is a risk that tenders in which the group participates or plans to participate could be delayed or withdrawn, for instance as a result of political changes, appeals or legal actions by unsuccessful bidders. On the other hand, a risk exists that Kapsch TrafficCom may not win its bids for new projects due to technological, financial, formal or other reasons. Recurring revenues from the technical and commercial operation of systems also depend on the successful participation in tenders for systems.

In the past, the revenues of the Kapsch TrafficCom Group have been heavily influenced by the realization of implementation projects in the segment RSP in the given fiscal year. In particular, significantly higher revenues were recorded in 2003 (implementation of a nationwide electronic truck toll collection system in Austria), 2006/07 (implementation of a nationwide electronic truck toll collection system in the Czech Republic), 2010/11 (implementation of an electronic toll collection system in the South African province of Gauteng) and 2011/12 (implementation of a nationwide electronic truck toll collection system in Poland). In fiscal year 2012/13, 2013/14 as well as 2014/15 sizeable revenues were generated from the implementation of a nationwide electronic truck toll collection system in Belarus. In the past fiscal years, revenue contribution from the implementation of projects with a smaller volume have constantly increased, deriving mainly from the geographical regions U.S.A. and Australia.

The approach of the Kapsch TrafficCom Group is aimed, among other things, at reducing this volatility of revenues through increased geographic diversification and increased diversification of the customer base and product portfolio as well as sustained growth in the share of technical and commercial system operation in total revenues in the interest of strengthening the segment Services, System Extensions, Components Sales (SEC).

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Technical challenges and tight schedules produce typical project risks.

**Risks of project execution.** In connection with the installation of systems, Kapsch TrafficCom Group is usually contractually obligated to provide performance and time-limit guarantees. Since electronic toll collection systems and other intelligent transportation systems are frequently sophisticated and technologically complex systems that must be implemented within a short timeframe, system and product defects or missed deadlines may occur due to the limited time available. Unexpected project modifications, lack of qualified personnel, quality defects, unexpected technical problems as well as performance problems of suppliers or consortium members may also have a negative impact on project schedules. The failure to meet guaranteed performance levels or deadlines in some cases results in penalties and/or compensation for damages, sometimes also compensation for lost toll revenues. Significant deadline overruns also frequently trigger contractual clauses that enable clients to terminate contracts prematurely. A significant delay in a project, failure to achieve guaranteed performance levels or failure to implement a project in time would also reduce the chances of success in future tenders for systems. There is also the risk that Kapsch TrafficCom Group cannot execute projects in line within the set cost budgets. Due to the strong social opposition to toll systems that is sometimes encountered, the risk of a late or limited rollout of the toll systems exists in many projects, which can have further consequences on payment flows and revenue in the operation project.

Kapsch TrafficCom Group employs risk management methods and project risk management procedures based on IPMA (International Project Management Association) standards in order to guard against risks associated with projects.

**Long-term contracts with public authorities.** In many cases, the system contracts are awarded by public agencies. Framework agreements and service contracts in connection with toll collection projects may include terms and conditions that are not negotiable in a tender process and that may be disadvantageous to the

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Kapsch TrafficCom Group. Some long-term contracts include challenging requirements with regard to the performance of the implemented systems, components and processes. These requirements can, if they are not achieved, result in significant penalties, damages or even contract termination. On the other hand, some contracts include substantial bonus payments for over-fulfillment of performance requirements. In the case of long-term contracts, the margins earned can also differ from the original estimates due to changes in costs.

Liabilities arising from contracts concluded by the Kapsch TrafficCom Group may include liabilities regarding customers' loss of profit, product liabilities and other liabilities. While the group aims to include appropriate limitations to its liability in contracts, it is still impossible to guarantee that all contracts contain sufficient limitations to the group's liability or that these limitations can be enforced under applicable law.

### Strategic risks

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Continuous innovation is essential for maintaining and improving the global market position.

**Capacity for innovation.** The strong market position of the Kapsch TrafficCom Group is, to a large extent, based on its ability to develop state-of-the-art, efficient and reliable systems, components and products. Kapsch TrafficCom is committed to a permanent and integrated innovation process. In order to maintain its already strong position in technology, the Kapsch TrafficCom Group invests a considerable portion of its revenues in research and development activities. However, if the group does not succeed in developing new systems, components and products, this can be detrimental to its competitive position.

Since its capacity for innovation is based largely on technology, internal know-how and intellectual property, the global increase in product piracy and reverse engineering may have negative effects on the group. In addition, any failures in protecting these technologies may have a negative impact on the group's competitive position. Moreover, it is possible that systems, components, products or services could infringe on the intellectual property rights of third parties. The Kapsch TrafficCom Group places great importance on the protection of technologies and the company's internal know-how, e.g. through patents and non-disclosure agreements with other parties.

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The international growth is opening up new opportunities but also poses risks.

**Acquisition and integration of companies as a part of the group's growth.** One of the strategic objectives of the Kapsch TrafficCom Group is to grow internationally both by organic means and through select acquisitions and joint ventures. In the implementation of this strategy, the group has acquired and integrated companies around the world. However, a number of challenges remain in connection with this growth strategy in order to realize the desired synergies and objectives. Opportunities arise from the acquisition of new technologies and market know-how.

**Country risk.** The strong expansion of business activities in Eastern Europe and non-European countries has exposed the Kapsch TrafficCom Group to heightened political risks. Significant and unforeseeable political changes can exert a major influence on the ability to implement or operate ITS projects in these countries and can also affect the availability and accessibility of funds. There may also be interference with the property rights of the Kapsch TrafficCom Group or complications regarding business practices and activities.

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Financial risks arise from exchange rate fluctuations, interest and credit risks. Sufficient liquidity increases flexibility to act at short notice.

## Financial risks

**Foreign exchange risk.** The Kapsch TrafficCom Group maintains branches, offices and subsidiaries in a number of countries outside the euro zone. A considerable portion of revenues and costs are denominated in the currencies of the respective foreign companies rather than in euros. Although the group aims to hedge the net currency position of the individual contracts as necessary, currency fluctuations may result in exchange rate losses that may influence the consolidated financial statements (transaction risk). As a result of the sometimes volatile payment flows in the project business, hedging the associated risks is only possible to a limited extent; the remaining currency rate risk is accepted and taken into account in the company planning. In addition, risks arise from the conversion of the separate financial statements of international companies into the group currency, the euro (translation risk). Fluctuations in exchange rates may also result in a change in the competitive position of the Kapsch TrafficCom Group.

**Interest rate risk.** Within the framework of project financing, the group regularly agrees to variable interest rates that are tied to market interest rates (Euribor, Pribor etc.). This exposes the Kapsch TrafficCom Group to interest rate risks. The group utilizes appropriate financial instruments to hedge against interest rate risks when these risks are significant.

**Liquidity risk.** Sufficient financial resources must be available to ensure that the Kapsch TrafficCom Group can meet its payment liabilities at any time. Medium and long-term financing must be available in order to carry out large-scale projects (such as implementing a nationwide toll collection system under delayed payment terms from the client) and for acquiring other companies. Additionally, implementing large-scale projects often requires the provision of significant bank guarantees to secure bid obligations (bid bonds) or to secure possible warranty claims (performance bonds).

In financing agreements, the Kapsch TrafficCom Group is subject to the customary restrictions in terms of its business policy, e.g. when drawing additional loans, using assets as collateral or providing guarantees for third parties. The availability of financing and bank guarantees depends on market conditions as well as the net assets and financial position of the Kapsch TrafficCom Group and the results of operations. A lack of liquid assets (even if the group is otherwise solvent), of financing or of bank guarantees can have an extremely adverse impact on the net assets and financial position of the Kapsch TrafficCom Group and the results of operations. Liquidity risk is managed by ongoing, company-wide financial and cash planning. Potential liquidity shortages can thus be identified and mitigated.

**Credit risk.** The Kapsch TrafficCom Group is exposed to the risk of non-payment by customers. The credit ratings of new and existing customers are checked as needed and secured. Many of the key customers of the Kapsch TrafficCom Group are public authorities, especially in connection with implementing and/or operating nationwide or regional toll collection systems. The Kapsch TrafficCom Group also increasingly acts as a subcontractor to third parties (concessionaires, general contractors, etc.) in public sector projects. Additionally, Kapsch TrafficCom Group makes use of guarantees provided by OeKB (Oesterreichische Kontrollbank AG), EKN (Exportkreditnämnden; Swedish National Export Credits Guarantee Board) and MIGA (Multilateral Investment Guarantee Agency).

There is also a risk that the counterparties (including financial institutions assumed to have good credit ratings) of both original and derivative financial instruments cannot meet their payment obligations when due. A payment default or the recognition of impairment charges to receivables can be extremely detrimental to the net assets and financial position of the Kapsch TrafficCom Group and the results of operations.

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Kapsch TrafficCom addresses personnel risk with attractive offers.

### Personnel risks

The success of the Kapsch TrafficCom Group depends heavily on key personnel with many years of experience in the industry. Moreover, the group's ability to recruit qualified staff, integrate them into the company and retain them over the long-term is crucial. The loss of key personnel and difficulties in the recruitment of personnel may adversely affect the success of the group.

Kapsch TrafficCom Group has implemented a number of measures to counteract personnel risks, such as incentive schemes and employee development opportunities.

### Legal risks

A variety of regulations and legal requirements must be observed in connection with participating in public tenders, implementing infrastructure for ITS solutions (such as toll stations) and the operation of toll collection systems. Identifying and adhering to applicable legal regulations and requirements can result in considerable administrative and technical expense. The failure to meet regulations or official requirements can lead to severe penalties and can also reduce the possibility of (successfully) taking part in tenders or continuing with the given business activity.

With the expansion into new regions and new ITS business areas, the risk of patent infringement or the violation of property rights increases. Kapsch TrafficCom has implemented active intellectual property (IP) management as a separate function. In order to avoid legal actions and court proceedings, the Kapsch TrafficCom Group monitors potential intellectual property rights infringements continuously as well as prior to entry into new markets or regions.

### IT risks

As a technology group, the Kapsch TrafficCom Group is exposed to typical IT risks relating to security, confidentiality and the availability of data. For this reason, Kapsch TrafficCom AG has implemented an IT risk management system designed according to the corporate risk and IT security application method (CRISAM) and has been certified pursuant to ISO 27001 (information security management). The Kapsch TrafficCom Group is also certified according to ISO 20000 "IT service management" (similar to ITIL) for the operation of toll collection systems and promoting the rollout of CRISAM as an IT risk management tool, as it is already the case in Poland and Belarus.

### Opportunities

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The early identification of opportunities opens up new potential.

The enterprise risk management approach of Kapsch TrafficCom AG not only addresses risks but also encompasses the regular identification, evaluation and management of opportunities. The goal of these efforts is to manage the strategic orientation of the product portfolio and market activities through the early identification of opportunities and to develop corresponding potential.

**Market opportunities** exist in geographic diversification as well as increasing expansion of the customer and product portfolio, driven in part by the following factors:

Due to the increasing financing requirements of infrastructure projects and the growing need to relieve state budgets, there exists an opportunity to develop new markets, especially in emerging and developing countries, as well as an opportunity to expand our activities into already developed markets.

The global rise in traffic volumes and the associated impact on the environment and society open up opportunities in the area of traffic management because measures such as toll collection, road pricing and the establishment

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of environmental zones or access restrictions are increasingly being employed as controlling instruments of environmental and traffic policy. In both the ETC and ITS segments, this is creating opportunities to further develop and market the portfolio according to the requirements.

The drive to increase the productivity of vehicles and vehicle operations as well as the rising comfort expectations of travelers also open up new opportunities for expanding the functionality of existing systems. Opportunities also exist to obtain new customers outside of the public sector, such as in the area of fleet management or to address public or end customers with new solutions for smart parking.

**Other opportunities.** Constant innovation and technical advancements create opportunities for the Kapsch TrafficCom Group to improve the efficiency and performance of customer systems as well as to gain a technological edge over competitors with regard to the performance and functionality of the offered systems.

#### **Summary assessment of the risk situation**

From the current perspective, no risks have been identified that could endanger the continued operations of the Kapsch TrafficCom Group. Increasing geographic expansion, the diversification of the product and solution portfolio (strengthening of the ITS business) and an increased share of recurring revenues (further growth in the segment Services, System Extensions, Components Sales) are planned to further reduce the concentration of risks in the future.

### **3.4 Internal Control System (ICS) in regard to the finance process**

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The reliability of the internal control system is evaluated by Internal Audit.

Kapsch TrafficCom AG began analyzing and documenting its existing internal processes for financial reporting on an ongoing basis in fiscal year 2009/10. The results obtained so far have been presented at the quarterly meetings of the audit committee for assessment and discussion. The internal audit department ensures by audits of the subsidiaries of Kapsch TrafficCom AG that a reliable and functioning control system is implemented.

A group-wide initiative for uniform documentation of all controlling measures for achieving key controlling goals was undertaken in fiscal year 2013/14. The standardized tracking enables improved controlling of measures to increase the efficiency of the internal control system and serves as the basis for future audits of the performance of local internal control systems.

The Group IFRS Accounting Manual represents the cornerstone for financial accounting and reporting throughout the whole Kapsch Group. The manual is published and regularly updated by the Kapsch Group and contains the essential financial and reporting procedures based on the International Financial Reporting Standards (IFRS). Groupwide guidelines, work instructions and process descriptions represent another important pillar of the internal control system.

The central elements of the ICS process include regular verification of compliance with the principle of dual control and the segregation of duties as well as defined actions for monitoring the effectiveness and efficiency of operating activities, the reliability of financial reporting and the compliance with relevant legal regulations. The ICS guidelines of Kapsch TrafficCom AG follow the basic structure of the internationally recognized standards for internal control systems (COSO – Internal Control Framework of the Committee of Sponsoring Organizations of the Treadway Commission).

The accounting for all group transactions is handled by a variety of software solutions. In a number of countries, the accounting has been outsourced to locally-based tax accountants due to the size of the subsidiaries. Companies submit reporting packages to the head office on a monthly basis which contain all accounting data pertaining to the statement of comprehensive income, balance sheet and cash flow statement. The data is then transferred into the central consolidation system (Hyperion Financial Management) on a quarterly basis. This



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financial information is verified on group level in Kapsch TrafficCom AG and subsequently forms the basis for the quarterly reports issued by the Kapsch TrafficCom Group in accordance with IFRS.

The supervisory board is kept informed of business developments by the executive board during regular meetings by way of consolidated presentations consisting of segment reporting, earnings development analyses with comparisons of current figures to figures from the budget and the previous period, forecasts, group financial statements and developments in the number of employees and order inflow as well as select financial figures.

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Internal control systems are locally implemented and centrally monitored.

In keeping with the decentralized structure of the Kapsch TrafficCom Group, local management is responsible for the implementation and monitoring of the internal control system. The managing directors of the individual subsidiaries are responsible for establishing and designing internal control and risk management processes that meet the needs of the given company in view of accounting procedures, as well as for ensuring compliance with the groupwide rules and guidelines in this respect. In order to assist the local management of the subsidiaries, the function of an ICS manager was established within the finance department of Kapsch TrafficCom AG. The duty of this function is to standardize and continuously improve the ICS within the Kapsch TrafficCom Group, to monitor the compliance and effectiveness of the controls and the improvement of found weaknesses and to report periodically to the audit committee of the supervisory board.

### **3.5 Disclosures pursuant to Section 267 UGB in connection with Section 243a Para. 1 UGB**

1. The registered share capital of Kapsch TrafficCom AG amounts to EUR 13.0 million and is fully paid in. It is divided into 13 million no-par value ordinary bearer shares.
2. There are no restrictions relating to the exercise of voting rights or the transfer of shares.
3. As of 31 March 2015, approximately 36.9 % of the shares of Kapsch TrafficCom AG were in free float. As of 31 March 2015, KAPSCH-Group Beteiligungs GmbH held approximately 63.1 % of the shares. KAPSCH-Group Beteiligungs GmbH is a wholly-owned subsidiary of DATAX HandelsgmbH, whose shares are equally held by Traditio-Privatstiftung, ALUK-Privatstiftung and Children of Elisabeth-Privatstiftung, each a private foundation under the Austrian Private Foundation Act (*Privatstiftungsgesetz*). These are each attributable to members of the Kapsch family. As of 31 March 2015, no other shareholder held more than 10 % of the voting rights in Kapsch TrafficCom AG.
4. None of the shares convey special control rights.
5. There are no restrictions regarding the execution of voting rights by employees with a share in the company.
6. There are no special provisions on the appointment and removal of members of the executive board and the supervisory board and no special provisions regarding the amendment of the articles of association of the company.
7. Neither authorized capital nor conditional capital currently exists at the company, which empowers the executive board to issue shares with the approval of the supervisory board and without (renewed) consideration by the annual general meeting.
8. There are no agreements which become effective when a public takeover offer for shares is launched.
9. There are no agreements between Kapsch TrafficCom AG and members of the executive board or the supervisory board or employees which become effective when a public takeover offer for shares in the company is launched.

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#### 4 Material events after the balance sheet date.

A controlling majority in the California-based Streetline, Inc., U.S.A., was acquired on 14 April 2015 through the merger with the newly incorporated KTCSL Merger Corp., Delaware, U.S.A.. Streetline is a leading smart parking company that offers intelligent data and modern analytics to solve parking space problems for end users.

On 28 April 2015, Kapsch TrafficCom made holders of the corporate bond a buyback offer at a rate of 105.75 %, valid until 19 May 2015. This offer was utilized at a nominal value of EUR 4,182,000. The purchased debt instruments were submitted to the Oesterreichische Kontrollbank (ÖKB) for redemption on 22 May 2015, leaving the corporate bond with an outstanding volume of EUR 70,8 million with maturity on 3 November 2017.

#### 5 Outlook and targets.

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The further development of the company should ensure that Kapsch TrafficCom remains a leading provider in the future.

As part of the comprehensive Program 2020, Kapsch TrafficCom defined a future strategy in fiscal year 2014/15 for developing and transforming the group's business. Three strategic priorities were also defined for the coming years: Operational excellence, secure and grow the core business and inaugurate an intelligent mobility solutions (IMS) business.

The next years will therefore be challenging for the Kapsch TrafficCom Group but will also offer many new opportunities. The initiated cost savings will fully take effect over the course of the fiscal year 2015/16. The profitability of the core business should then lie at roughly 10 %, as expected, once again leaving sufficient freedom for future investments. A first step toward this future was taken with the purchase of a majority interest in the Californian smart parking provider Streetline in April 2015. Due to the additional investments required, the reported EBIT margin of the Kapsch TrafficCom Group will therefore presumably still remain below 10 % in the fiscal year 2015/16.

Kapsch TrafficCom will concertedly continue existing projects and work to further strengthen its market position with new developments and projects. In the years to come, some existing contracts for operation projects will be put out to tender again. This will be the case in 2016 for the nationwide electronic truck toll system in the Czech Republic and the invitation to tender for the technical operation and maintenance of the nationwide electronic truck toll system in Austria, although the current contract for the latter is confirmed to be continued until June 2017. Kapsch TrafficCom will strive to win these tenders again with the best service offer.

The goal of Kapsch TrafficCom is to consistently improve the group as well as its solutions, products and services in order to remain among the top providers on the market in the future.

Vienna, 8 June, 2015



Georg Kapsch  
Chief Executive Officer



André Laux  
Chief Operating Officer

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# Statement

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## of all Members of the Executive Board.

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### Statement of all Members of the Executive Board pursuant to Section 82 Para. 4 No. 3 BörseG (Austrian Stock Exchange Act)

We declare to the best of our knowledge that the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and profit or loss of the group as required by the applicable accounting standards and that the group management report gives a true and fair view of the development and performance of the business and the position of the group, together with a description of the principal risks and uncertainties faced by the group.

Vienna, 8 June, 2015



Georg Kapsch  
Chief Executive Officer



André Laux  
Chief Operating Officer

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## **Additional information**

### **pursuant to Section 82 Para. 4 No. 3 BörseG. (Austrian Stock Exchange Act)**

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<b>Board member</b>	<b>Area of responsibility</b>
Georg Kapsch Chairman/CEO	Finance & Administration, Mergers & Acquisitions, Investor Relations, Compliance, Strategy, Legal Services, International Subsidiaries & Management Systems, Human Resources, Marketing & Communications, Solution Management, Engineering and Sales Region North America
André Laux Member/COO	Sales Region 1 and 2 <sup>1</sup> , Production & Logistics and Delivery & Operations

<sup>1</sup> The sales regions have developed historically and are addressed in the case of Region 1 by Kapsch TrafficCom AG, Austria, and in the case of Region 2 by Kapsch TrafficCom AB, Sweden

# Consolidated Financial Statements

## as of 31 March 2015.

### Consolidated statement of comprehensive income.

All amounts in EUR	Note	2014/15	2013/14
<b>Revenues</b>	(1)	<b>456,377,377</b>	<b>486,966,886</b>
Other operating income	(2)	21,220,911	15,227,104
Changes in finished and unfinished goods and work in progress	(3)	-5,276,194	-5,975,736
Other own work capitalized		104,353	141,383
Cost of materials and other production services	(4)	-168,034,419	-228,043,730
Staff costs	(5)	-148,102,477	-139,192,569
Amortization and depreciation	(6)	-16,434,371	-16,590,897
Impairment charge	(6)	-12,342,000	0
Other operating expenses	(7)	-94,763,384	-92,255,847
<b>Operating result</b>		<b>32,749,796</b>	<b>20,276,594</b>
Finance income	(8)	13,255,371	5,541,619
Finance costs	(8)	-26,306,798	-20,488,627
<b>Financial result</b>		<b>-13,051,426</b>	<b>-14,947,009</b>
Results from associates	(14)	233,819	158,443
<b>Result before income taxes</b>		<b>19,932,188</b>	<b>5,488,028</b>
Income taxes	(9)	-8,524,107	-2,631,956
<b>Result for the period</b>		<b>11,408,081</b>	<b>2,856,072</b>
<b>Result attributable to:</b>			
Equity holders of the company		3,629,908	-4,299,498
Non-controlling interests		7,778,173	7,155,570
		<b>11,408,081</b>	<b>2,856,072</b>
<b>Earnings per share from the result for the period attributable</b>			
to the equity holders of the company (in EUR)	(31)	0.28	-0.33
diluted	(31)	0.28	-0.33
undiluted			
<b>Other comprehensive income for the period:</b>			
<b>Items subsequently reclassified to the result for the period:</b>			
Currency translation differences		-12,558,566	-3,947,156
Currency translation differences from net investments in foreign operations		9,045,070	-643,594
Available-for-sale financial assets:			
Fair value gains/losses recognized in other comprehensive income		2,030,730	-7,814,018
Reclassification of cumulated net losses to the result for the period (impairment)		12,185,425	0
Income tax relating to items subsequently reclassified to the result for the period		-2,389,978	52,059
<b>Total items subsequently reclassified to the result for the period</b>		<b>8,312,681</b>	<b>-12,352,709</b>
<b>Items subsequently not reclassified to the result for the period:</b>			
Remeasurements of liabilities from post-employment benefits		-3,164,172	-464,660
Income tax relating to items subsequently reclassified to the result for the period		645,608	36,794
<b>Total items subsequently not reclassified to the result for the period</b>		<b>-2,518,564</b>	<b>-427,866</b>
<b>Other comprehensive income for the period net of tax</b>	(10)	<b>5,794,117</b>	<b>-12,780,575</b>
<b>Total comprehensive income for the period</b>		<b>17,202,198</b>	<b>-9,924,503</b>
Total comprehensive income attributable to:			
Equity holders of the company		9,226,306	-15,902,406
Non-controlling interests		7,975,892	5,977,903
		<b>17,202,198</b>	<b>-9,924,503</b>

## Consolidated balance sheet.

All amounts in EUR	Note	31 March 2015	31 March 2014
<b>ASSETS</b>			
<b>Non-current assets</b>			
Property, plant and equipment	(12)	22,393,204	23,447,039
Intangible assets	(13)	71,250,401	89,567,390
Interests in associates	(14)	2,013,952	1,596,106
Other non-current financial assets and investments	(15)	23,099,327	28,506,061
Other non-current assets	(16)	28,137,787	71,112,851
Deferred tax assets	(22)	13,590,224	22,109,558
		<b>160,484,896</b>	<b>236,339,005</b>
<b>Current assets</b>			
Inventories	(17)	47,669,688	58,107,757
Trade receivables and other current assets	(18)	205,387,202	209,720,873
Other current financial assets	(15)	5,290,815	4,924,111
Cash and cash equivalents	(19)	96,764,803	57,731,290
		<b>355,112,509</b>	<b>330,484,031</b>
<b>Total assets</b>		<b>515,597,404</b>	<b>566,823,037</b>
<b>EQUITY</b>			
<b>Capital and reserves attributable to equity holders of the company</b>			
Share capital	(20)	13,000,000	13,000,000
Capital reserve		117,508,771	117,508,771
Retained earnings and other reserves		77,449,325	72,291,120
		<b>207,958,096</b>	<b>202,799,891</b>
<b>Non-controlling interests</b>		<b>11,403,134</b>	<b>10,310,208</b>
<b>Total equity</b>		<b>219,361,230</b>	<b>213,110,099</b>
<b>LIABILITIES</b>			
<b>Non-current liabilities</b>			
Non-current financial liabilities	(21)	88,984,654	109,494,268
Liabilities from post-employment benefits to employees	(23)	25,210,018	22,152,563
Non-current provisions	(26)	1,661,173	1,302,519
Other non-current liabilities	(24)	4,656,718	3,659,711
Deferred income tax liabilities	(22)	2,379,882	10,777,965
		<b>122,892,444</b>	<b>147,387,027</b>
<b>Current liabilities</b>			
Trade payables		48,441,473	67,388,050
Other liabilities and deferred income	(25)	65,535,073	62,809,928
Current tax payables		1,173,523	1,190,660
Current financial liabilities	(21)	48,968,988	46,559,523
Current provisions	(26)	9,224,672	28,377,749
		<b>173,343,730</b>	<b>206,325,911</b>
<b>Total liabilities</b>		<b>296,236,174</b>	<b>353,712,938</b>
<b>Total equity and liabilities</b>		<b>515,597,404</b>	<b>566,823,037</b>

## Consolidated statement of changes in equity.

All amounts in EUR	Attributable to equity holders of the company				Non-	Total equity
	Share capital	Capital reserve	Other reserves	Consolidated retained earnings	controlling interests	
<b>Carrying amount as of 31 March 2013 (adjusted)</b>	<b>13,000,000</b>	<b>117,508,771</b>	<b>-1,423,687</b>	<b>95,503,311</b>	<b>12,114,574</b>	<b>236,702,969</b>
Effects from increase in shares of subsidiaries			-878,482		-692,359	-1,570,840
Effects from deconsolidation of subsidiaries					718	718
Dividend				-5,200,000	-6,898,246	-12,098,246
Result for the period				-4,299,498	7,155,570	2,856,072
Other comprehensive income for the period:						
Currency translation differences			-3,059,801		-1,370,050	-4,429,851
Fair value gains/losses on available-for-sale financial assets			-7,922,858			-7,922,858
Remeasurements of liabilities from post-employment benefits			-427,866			-427,866
<b>Carrying amount as of 31 March 2014</b>	<b>13,000,000</b>	<b>117,508,771</b>	<b>-13,712,693</b>	<b>86,003,813</b>	<b>10,310,208</b>	<b>213,110,099</b>
Effects from increase in shares of subsidiaries			-4,068,101		41,799	-4,026,302
Effects from initial consolidation of subsidiaries					4,900	4,900
Dividend					-6,929,665	-6,929,665
Result for the period				3,629,908	7,778,173	11,408,081
Other comprehensive income for the period:						
Currency translation differences			-5,972,483		197,719	-5,774,764
Fair value gains/losses on available-for-sale financial assets			14,087,445			14,087,445
Remeasurements of liabilities from post-employment benefits			-2,518,564			-2,518,564
<b>Carrying amount as of 31 March 2015</b>	<b>13,000,000</b>	<b>117,508,771</b>	<b>-12,184,396</b>	<b>89,633,721</b>	<b>11,403,134</b>	<b>219,361,230</b>

**Share capital.** The total number of shares issued is 13,000,000. The shares are ordinary bearer shares and have no par value.

**Capital reserve.** Capital reserve includes those reserves that have not been established from results of prior periods.

**Other reserves.** Other reserves contain effects of changes in the investment interest held in subsidiaries as well as reserves from other comprehensive income, for example currency translation differences and fair value gains/losses on available-for-sale financial assets after deduction of deferred taxes and remeasurements of liabilities from post-employment benefits after deduction of deferred taxes.

**Consolidated retained earnings.** Retained earnings include the net result for the fiscal year as well as past earnings of the entities included in consolidation, to the extent that these results have not been distributed as dividends.

**Non-controlling interests.** Non-controlling interests represent the third party shares in the equity of consolidated subsidiaries. The effects from the increase in shares in the fiscal year 2014/15 result from the acquisition of the remaining shares in Kapsch Telematic Services GmbH, Vienna. The effects from the increase in shares in the fiscal year 2013/14 result from the acquisition of further shares in TMT Services and Supplies (Pty) Ltd., Capetown, South Africa.

## Consolidated cash flow statement.

All amounts in EUR	Note	2014/15	2013/14 (adjusted)
<b>Cash flow from operating activities</b>			
Operating result		32,749,796	20,276,594
Adjustments for non-cash items and other reconciliations:			
Scheduled depreciation and amortization	(6)	16,434,371	16,590,897
Impairment charge	(6)	12,342,000	0
Increase/decrease in obligations for post-employment benefits	(23)	-245,363	-1,778,223
Increase/decrease in other non-current liabilities and provisions	(24, 26)	-31,271	1,397,031
Increase/decrease in other non-current receivables and assets	(15)	3,646,195	-1,254,172
Increase/decrease in trade receivables (non-current)	(16)	46,367,768	-64,919,991
Increase/decrease in trade payables (non-current)	(24)	-891,853	-384,989
Other (net)		-1,798,344	-10,451,455
		<b>108,573,298</b>	<b>-40,524,306</b>
Changes in net current assets:			
Increase/decrease in trade receivables and other assets	(18)	6,031,721	54,331,561
Increase/decrease in inventories	(17)	10,438,069	8,333,735
Increase/decrease in trade payables and other current payables		-15,462,030	-22,548,447
Increase/decrease in current provisions	(26)	-19,153,077	144,395
		<b>-18,145,317</b>	<b>40,261,244</b>
<b>Cash flow from operations</b>		<b>90,427,981</b>	<b>-263,062</b>
Interest received	(8)	1,773,062	1,450,169
Interest payments	(8)	-5,982,746	-5,504,166
Net payments of income taxes		-11,006,156	-6,582,573
<b>Net cash flow from operating activities</b>		<b>75,212,141</b>	<b>-10,899,634</b>
<b>Cash flow from investing activities</b>			
Purchase of property, plant and equipment	(12)	-7,374,407	-10,571,546
Purchase of intangible assets	(13)	-993,841	-5,111,623
Purchase of securities, investments and other non-current financial assets	(15)	-361,651	-575,700
Payments for the acquisition of entities (less cash and cash equivalents of these entities)		0	-11,957,526
Proceeds from the disposal of property, plant and equipment and intangible assets		1,353,079	1,923,980
Proceeds from the disposal of securities and other financial assets		0	557,154
<b>Net cash flow from investing activities</b>		<b>-7,376,820</b>	<b>-25,735,262</b>
<b>Cash flow from financing activities</b>			
Contributions from shareholders		4,900	0
Dividends paid to parent company's shareholders		0	-5,200,000
Dividends paid to non-controlling interests		-6,929,665	-6,898,246
Payments for the acquisition of non-controlling interests		-2,000,000	-1,570,840
Increase in non-current financial liabilities	(21)	183,719	26,175,745
Decrease in non-current financial liabilities	(21)	-20,693,333	-720,000
Increase in current financial liabilities	(21)	7,053,189	19,398,093
Decrease in current financial liabilities	(21)	-9,526,490	-12,239,851
<b>Net cash flow from financing activities</b>		<b>-31,907,680</b>	<b>18,944,901</b>
<b>Net increase/decrease in cash and cash equivalents</b>		<b>35,927,641</b>	<b>-17,689,995</b>
<b>Change in cash and cash equivalents</b>			
Cash and cash equivalents at beginning of year	(19)	57,731,290	79,022,460
Net increase/decrease in cash and cash equivalents		35,927,641	-17,689,995
Exchange gains/losses on cash and cash equivalents		3,105,873	-3,601,176
<b>Cash and cash equivalents at end of year</b>	(19)	<b>96,764,803</b>	<b>57,731,290</b>



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# Notes to the Consolidated Financial Statements.

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## General information.

Kapsch TrafficCom Group is an international supplier of superior intelligent transportation systems (ITS).

The business activities of the Kapsch TrafficCom Group are subdivided into the following three segments:

- ▶ Road Solution Projects (RSP)
- ▶ Services, System Extensions, Components Sales (SEC)
- ▶ Others (OTH)

The segment Road Solution Projects relates to the installation of ITS solutions.

The segment Services, System Extensions, Components Sales relates to the sale of services (maintenance and operation) and components in the area of ITS solutions.

The segment Others relates to non-core business activities conducted by Kapsch Components GmbH & Co KG. In this segment, Kapsch TrafficCom Group offers engineering solutions, electronic manufacturing and logistics services to affiliated entities and third parties. Furthermore, the non-ITS relevant business of KTC USA Inc. is allocated to this segment, including solutions, systems and services for operational monitoring of public transportation and environmental infrastructure.

## Group structure.

The parent company (reporting entity) of this group is Kapsch TrafficCom AG, Vienna. Until June 2007 KAPSCH-Group Beteiligungs GmbH, Vienna, (immediate parent company of the reporting entity), a wholly-owned subsidiary of DATAX HandelsgmbH, had been the sole shareholder of Kapsch TrafficCom AG. DATAX HandelsgmbH, Vienna, is the controlling entity of the reporting entity and the ultimate parent of Kapsch Group.

As of 31 March 2015 KAPSCH-Group Beteiligungs GmbH has a share of 63.13 % (31 March 2014: 61.92 %) in Kapsch TrafficCom AG, Vienna. The shares of Kapsch TrafficCom AG in free float are listed in the Prime Market segment of the Vienna Stock Exchange since 26 June 2007.

## Consolidated group.

Die Muttergesellschaft Kapsch TrafficCom AG ist eine Aktiengesellschaft, eingetragen und ansässig in Wien, The parent company, Kapsch TrafficCom AG, is a joint stock corporation incorporated and domiciled in Vienna, Austria. The address of its registered office is 1120 Vienna, Am Europlatz 2.

As of 31 March 2015 the consolidated group consists of 47 entities (31 March 2014: 48 entities). The consolidated group changed as follows:

	2014/15	2013/14
Amount of entities at the beginning of the fiscal year	48	49
Initial consolidation	3	2
Mergers	-3	-1
Deconsolidations	-1	-2
<b>Amount of entities in the consolidated group</b>	<b>47</b>	<b>48</b>

In the fiscal year 2014/15 Kapsch TrafficCom KGZ, Bischkek, Kyrgyzstan, Kapsch TrafficCom Lietuva, Vilnius, Lithuania as well as KTCSL Merger Corp., Delaware, U.S.A., were newly founded.

In the fiscal year 2014/15 Kapsch TrafficCom IVHS Technologies Holding Corp., McLean, USA, Kapsch TrafficCom IVHS Holding Corp., McLean, U.S.A., Kapsch TrafficCom U.S. Corp., McLean, U.S.A., were merged into Kapsch TrafficCom Holding Corp., McLean, U.S.A..

In the fiscal year 2014/15 VTI Industrial Electronics (Proprietary Limited ZA) (South Africa), Germiston, South Africa was deconsolidated.

The regional distribution of our subsidiaries is as follows:

	2014/15	2013/14
Austria	6	6
Europe (excl. Austria)	17	16
America	11	13
Rest of the world	13	13
<b>Total</b>	<b>47</b>	<b>48</b>

Further information on interests in subsidiaries see note 28.

## Accounting policies.

The accounting policies applied in the preparation of these consolidated financial statements are set out below:

### 1 Basis of preparation.

Pursuant to Section 245a Austrian Commercial Code (UGB), the consolidated financial statements as of 31 March 2015 have been prepared in accordance with International Financial Reporting Standards (IFRS) as well as the International Financial Reporting Standards Interpretations Committee (IFRS IC) as adopted by the European Union (EU). The consolidated financial statements as of 31 March 2015 are prepared under the historical cost convention, with the exception of available-for-sale securities and derivative financial instruments, which are measured at fair value at the balance sheet date. Pertinent explanations can be found within the scope of the corresponding accounting policies.

The preparation of the consolidated financial statements in conformity with IFRS requires the use of estimates and assumptions which influence the amount and presentation of assets and liabilities reported at the balance sheet date as well as income and expenses recorded during the reporting period. Although these estimates are made by the management board to the best of their knowledge and are based on current transactions, actual figures may differ from these estimates. The areas involving a higher degree of judgment or complexity as well as areas where assumptions and estimates are material to the consolidated financial statements are disclosed in note 26.

For ease of presentation, amounts have been rounded and, unless indicated otherwise, are presented in thousands of euros (TEUR). However, calculations are done using exact amounts, including the digits not shown, which may lead to rounding differences.

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## 1.1 New and amended standards and interpretations that have been adopted by the EU and applied for the first time in the fiscal year 2014/15

**IFRS 10**, “Consolidated financial statements” builds on existing principles. IFRS 10, “Consolidated financial statements”, builds on existing principles by identifying the concept of control as the determining factor in whether an entity should be included within the consolidated financial statements of the parent company. Furthermore, the standard provides additional guidance to assist in the determination of control where this is difficult to assess. Here it is stipulated that control will be deemed to exist when a parent company can exercise its power over a subsidiary due to voting rights or other legal empowerment, the parent company is exposed to the positive as well as negative returns of the subsidiary, and the parent company is able to influence the amount of such returns given its position of power. IFRS 10 replaces the consolidated financial statements rules that had been in place until now under IAS 27 Consolidated and separate financial statements and SIC 12 Consolidation – special purpose vehicles. The group will apply IFRS 10 no later than the accounting period beginning on 1 April 2014. At present, the group does not expect IFRS 10 to have a material impact on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation.

**IFRS 11**, “Joint arrangements”, changes the definition of joint ventures. A joint arrangement is hereafter defined as an arrangement where two or more parties have a joint leading role. According to IFRS 11 there are only two types of joint arrangement: (i) joint operations and (ii) joint ventures. The classification of a joint arrangement depends on the rights and obligations arising in connection with the respective contracting parties. A joint arrangement is deemed to exist when the jointly dominating parties have direct rights to the assets and obligations for the liabilities. Each party to this joint arrangement reports its own assets, liabilities, revenues and expenditures. In a joint venture, the parties that have joint control of the arrangement have rights to the net assets of the arrangement. Accounting adheres to the equity method. The previously applicable proportionate consolidation method will no longer be permitted for joint ventures. The group has looked at the classification of the group’s participation in joint ventures and concluded that IFRS 11 had no material impact on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation, the reason for this being that there are currently no joint operations or joint ventures.

**IFRS 12**, “Disclosure of interests in other entities”, summarizes the revised disclosures with regard to IAS 27 and IFRS 10, IAS 31 and IFRS 11 as well as IAS 28 in one standard. The group has correspondingly extended its disclosures in the notes pursuant to IFRS 12.

**Changes to IAS 27**, “Separate financial statements”, residually regulates following the adoption of IFRS 10 “Consolidated financial statements” the provisions for the accounting of subsidiaries, joint ventures and associated companies in individual IFRS financial statements. The rules on consolidated financial statements have been revised and are now defined in IFRS 10 “Consolidated financial statements”. There is no significant impact on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation arising due to the new rule.

**Changes to IAS 28**, “Interests in associates and joint ventures”, requires the application of the equity method on joint ventures as well. The adoption of IFRS 11 “Joint Arrangements” led to the extending of the scope, so that alongside investments in associates and joint ventures could also be accounted for using the equity method. There is no material impact on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation as there are currently no joint ventures in the group.

**Amendments to IFRS 10, IFRS 12 and IAS 27 regarding “investment entities”**, lead to an exception to the consolidation obligation for subsidiaries pursuant to IFRS 10 “Consolidated Financial Statements”, applicable to entities which meet the definition of an investment entity. Here investment entities are recognized at their

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fair value pursuant to IFRS 9 and IAS 39 “Financial instruments: recognition and measurement”. There are no material impacts on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation as the group does not have any investment entities.

**Amendments to IAS 32**, “Financial instruments: presentation” complements the principles for setting off financial assets and financial liabilities. Setting off financial assets and financial liabilities will still only be possible if an entity currently has a legally enforceable right to set off the recognized amounts; it intends either to settle on a net basis or to realize the asset and settle the liability simultaneously. Amendments to this standard complement and clarify the application guidance with regard to the terms ‘present times’ and ‘simultaneousness’. At present, the group does not expect IAS 32 to have a material impact on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation.

**IAS 36**, “Impairment of assets” includes corrections of disclosure requirements. This concerns disclosures on the recoverable amount of impaired non-financial assets where the recoverable amount is valued at the corresponding fair value less costs to sell. Previously, the recoverable amount was to be stated irrespective of any impairment. The amendment restricts the disclosure requirements to cases of actual impairment, with the required disclosures being extended at the same time. At present, the group does not expect IAS 36 to have a material impact on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation.

**IAS 39**, “Financial instruments: recognition and measurement” was supplemented by a relief provision. The amendment aims at preventing a hedging relation from being triggered as a result of a hedging instrument being novated (novation meaning the contractual replacement of an existing obligation by creating a new one) with a central counterparty. The continuation of the hedging relationship is permissible provided that the novation takes place due to new or existing statutory or regulatory obligations and the contractual conditions of the derivative only change to the extent that is necessary for the purpose of such novation. The amendment does not have any bearing on the group.

**IFRIC 21**, “Levies”, defines the triggering point of provisions for taxes levied by government agencies in accordance with IAS 37 whose payment time or amount are still uncertain. It also defines how to account for corresponding liabilities, i. e. in instances in which both payment time and amount are already known. Income taxes within the meaning of IAS 12, however, are excluded from the scope of application. IFRIC 21 addresses the question as to what may be deemed an “obligating event” that leads to the recognition of a liability for the payment of a levy. The application of this interpretation may result in a levy payment obligation being recognized at a different time than previously – specifically in instances in which the payment obligation arises only if certain conditions apply at a certain point in time. There are no material impacts on the assets and liabilities, the financial position and operating results of the group as well as on the group’s presentation.

## **1.2 Standards, interpretations and amendments to published standards that are not yet effective and that have not been prematurely adopted by the group**

**Annual improvement to IFRS, 2010-2012 cycle** covers the improvements made to the following standards: IFRS 2 “Share-based payment”, IFRS 3 “Business combinations”, IFRS 8 “Operating segments”, IFRS 13 “Fair value measurement”, IAS 16 “Property, plant and equipment”, IAS 24 “Related party disclosures” and IAS 38 “Intangible assets”. The adjustments to the wording should serve to clarify existing rules, with disclosures to the notes also being affected. The group will adopt the amendments no later than the accounting period starting on 1 April 2015. At present, the group does not expect any material impacts on the assets and liabilities, the financial position and operating results of the group as well as the group’s presentation.

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**Annual improvement to IFRS, 2011-2013** cycle covers amendments to the following standards: IFRS 1 “First-time adoption of International Financial Reporting Standards”, IFRS 3 “Business combinations”, IFRS 13 “Fair value measurement” and IAS 40 “Investment property”. Existing wording was adjusted for clarification purposes. The group will adopt the amendments no later than the accounting period starting on 1 April 2015. At present, the group does not expect any material impacts on the assets and liabilities, the financial position and operating results of the group as well as the group’s presentation.

**Amendments to IAS 19**, “Employee benefits” – the amendment to IAS 19.93 now clarifies how the contributions of employees or third parties covered by the formal conditions of pension plans are to be accounted when such pension plans are linked to the number of years of service. The group will adopt the amendments no later than the accounting period starting on 1 April 2015. At present, the group does not expect any material impacts on the assets and liabilities, the financial position and operating results of the group as well as the group’s presentation.

**IFRS 14**, “Regulatory deferral accounts” makes it possible for companies using IFRS for the first time to carry on recognizing regulatory deferred accounts which it had compiled in accordance with its previously applicable statutory national accounting guidelines. As the group is not using IFRS for the first time and the rules are explicitly for the purpose of first time IFRS users, this means that the regulations are not applicable.

**Annual improvement to IFRS, 2012-2014** cycle cover amendments to the following standards: IFRS 5 “Non-current assets held for sale and discontinued operations”, IFRS 7 “Financial instruments: disclosures”, IAS 19 “Employee benefits” and IAS 34 “Interim financial reporting”. Existing wording was adjusted for clarification purposes. The group will adopt the amendments no later than the accounting period starting on 1 April 2016. At present, the group does not expect any material impacts on the assets and liabilities, the financial position and operating results of the group as well as the group’s presentation.

**Amendments to IAS 1** “Presentation of financial statements” serves to ensure that those compiling financial statements are able to use their discretion. The reason for such amendments was that previous wording in connection with certain rules in IAS 1 was sometimes seen as a hindrance to the exercising of discretion. With regard to the definition of materiality the amendments clarify that (1) information should not be obscured by aggregating or by providing immaterial information, (2) materiality considerations apply to the all parts of the financial statements, and (3) even when a standard requires a specific disclosure, materiality considerations do apply. The IASB furthermore (1) introduces a clarification that the list of line items to be presented in these statements can be disaggregated and aggregated as relevant and issues additional guidance on subtotals in these statements and (2) clarifies that an entity’s share of other comprehensive income of equity-accounted associates and joint ventures should be presented in aggregate as single line items based on whether or not it will subsequently be reclassified to profit or loss. Additional examples of possible ways of ordering the notes to clarify that understandability and comparability should be considered when determining the order of the notes are added. The group will adopt the amendments no later than the accounting period starting on 1 April 2016. At present, the group does not expect any material impacts on the assets and liabilities, the financial position and operating results of the group as well as the group’s presentation.

**Amendment to IAS 16**, “Property, plant and equipment” and IAS 38, “Intangible assets” – this amendment sees further regulations being specified for the use of acceptable methods for the depreciation of property, plant and equipment and the amortization of intangible assets. The group will adopt the amendments no later than the accounting period starting on 1 April 2016. At present, the group does not expect any material impacts on the assets and liabilities, the financial position and operating results of the group as well as the group’s presentation.

**Amendments to IAS 16**, “Property, plant and equipment” and IAS 41, “Agriculture” deal with changes in relation to fruit-bearing plants. The group will adopt the amendments no later than the accounting period starting on 1 April 2016. In view of the fact that the group does not have any fruit-bearing plants, these amendments will

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not have any impact on the on the assets and liabilities, the financial position and operating results of the group as well as the group's presentation.

**Amendment to IFRS 11, "Joint ventures"** – the amendments comprise additional guidelines which set out that the acquisition of a share in a joint operation which is a business operation within the meaning of IFRS 3 "Business combinations" is to be recognized under the acquisition method pursuant to IFRS 3 and other relevant standards. It further defines that when there is a purpose of further shares in a joint activity, no new valuation of the previously held shares will be necessary. However, the amendments do not apply if the jointly operating companies both come under the control of the parent company. The group will adopt the amendments no later than the accounting period starting on 1 April 2016. At present, the group does not expect any material impacts on the assets and liabilities, the financial position and operating results of the group as well as the group's presentation.

**IFRS 15, "Revenue from contracts with customers"** covers a comprehensive range of principles for the determination of the nature, the amount and the timing of the recognition of revenues and the resulting payment flows arising from a client contract. Here revenues are to be realized if the power of disposition of an asset is transferred to the client and the client can make the most of its advantages. The revenues are valued at the amount of consideration which a company can anticipate to receive from the client for the transfer of the goods or the provision of services. The new standard comprises a five level model to determine the realization of turnover which is to be used in the case of all contracts with clients. The contract with the client as well as independent performance obligations are to be identified. The transaction price is also to be determined and allocated according to the performance obligations under the contract. Finally, income is to be recognized subject to the company fulfilling its performance obligations. This standard contains further rules on whether revenues are to be recognized at a particular time or over a period of time. The rules under IFRS 15 will in future replace IAS 18 "Revenue", IAS 11 "Construction contracts" as well as a series of revenue related interpretations. The standard contains new comprehensive rules in relation to revenue specifications. The group will adopt IFRS 15 no later than the accounting period starting on 1 April 2018. The group is presently assessing the impact that the application of IFRS 15 can have on the consolidated financial statements.

**IFRS 9, "Financial instruments"** deals with the classification, the recognition and the measurement of financial assets and financial liabilities, the accounting of impairments of financial assets as well as hedge accounting. The final version of IFRS 9 was published in July 2014. It replaces the parts of IAS 39, "Financial Instruments: recognition and measurement" which deal with the classification and measurement of financial instruments. IFRS 9 requires financial assets to be classified into two measurement categories: those measured at fair value and those measured at amortized cost. For financial liabilities, the standard retains most of the IAS 39 requirements. The main change is that, in cases where the fair value option is taken for financial liabilities, the part of a fair value change due to an entity's own credit risk is recorded in other comprehensive income rather than in the statement of comprehensive income, unless this creates an accounting mismatch. With regard to impairments, in future not only losses incurred but also expected losses are to be recognized whilst taking into consideration whether a deterioration of the default risk has come about. IFRS 9 eases the rules on the measuring of hedge effectiveness given that the quantitative effectiveness assessment is principally dropped. It requires a business connection between the hedged underlying transaction and the hedging instrument. Additionally the hedging relationship must be related to what the management actually uses for risk management purposes. Simultaneous documentation is still required, although it does differentiate itself from the documentation currently compiled pursuant to IAS 39. The group will adopt IFRS 9 no later than the accounting period starting on 1 April 2018. The group is presently assessing the impact that the application of IFRS 9 can have on the consolidated financial statements.

There are no other standards or interpretations that are not yet effective that would be expected to have a material impact on the group.

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The consolidated financial statements were prepared by the management board on the undersigned date and released for publication. The entity financial statements of the parent company, which have been included in the consolidated financial statements after transition to the applicable accounting standards, have not yet been approved by the supervisory board on the undersigned date.

## **2 Consolidation.**

### **2.1 Subsidiaries**

Subsidiaries are all companies (including structured companies) where the group exerts its control. The group controls an associated company if the group is exposed to fluctuating returns arising from its interest in the subsidiary, is in possession of entitlements to these returns and has the ability to influence such returns by virtue of its position of power with respect to the associated company. Subsidiaries are included within the consolidated financial statements (full consolidation) as from the time when the parent company has acquired control over the subsidiary. They are deconsolidated at the time when such control is relinquished.

All group internal assets and liabilities, equity, expenses and income as well as unrealized gains and losses from transactions between group companies are completely eliminated in the course of group consolidation.

### **2.2 Transactions with non-controlling interests**

Transactions with non-controlling interests are treated as transactions with equity owners of the group. Depending on the ownership structure, the group splits the gains or losses as well as all components of the comprehensive income to the interests of the parent company and the non-controlling interests. Even in the event of a negative balance of the non-controlling interests, the total comprehensive income is attributed to the parent company and the non-controlling interests. For purchases of non-controlling interests, the difference between any consideration paid and the relevant interest acquired of the carrying value of net assets of the subsidiary is recorded in equity. Gains or losses on disposals to non-controlling interests are also recorded in equity, unless a change in the percentage of shares held leads to a loss of control of the interest.

If a change in the percentage of shares held does not lead to the loss of control of the interest, the transactions are to be shown under equity. The carrying amounts for both the controlling and non-controlling interests are correspondingly set so as to ensure they reflect any changes to the existing shareholdings. Every deviation between the amount by which the non-controlling interests are adjusted and the fair value of the paid or received consideration is to be directly recognized under equity and allocated to the owners of the parent company.

If the group loses its control over any of the companies, the assets and liabilities of the former subsidiary are to be removed from the consolidated balance sheet. The remaining interest is to be remeasured at fair value and regarded as the initially recognized value of a financial asset pursuant to IAS 39 "Financial Instruments: recognition and measurement" or as acquisition costs in case of the addition of an interest in an associated company or joint venture. Any resulting gains or losses which are attributable to the controlling interest are recognized in the income statement. In addition, any amounts previously recognized in other comprehensive income with respect to the previous subsidiary are accounted for as if the group had directly disposed of the related assets or liabilities. This means that amounts previously recognized in other comprehensive income are reclassified from equity to the result for the period.

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### 2.3 Joint arrangements

The group applies IFRS 11 to all joint arrangements. As of balance sheet date 31 March 2015 no joint arrangements exist within the group.

The group differentiates according to the contractual arrangements concerning rights and obligations of the controlling parties between joint ventures and joint operations. Parties belonging to a joint venture enjoy rights to net assets. In the consolidated financial statements the result, assets and liabilities are included subject to the equity method. If a contractual agreement creates rights to assets and obligations for debts, then such joint arrangement will be deemed to be a joint operation. Any decisions made must be unanimous in order to be effective. Inclusion within the consolidated financial statements occurs through the proportionate recognition of assets, debts, revenues and expenses.

In the case of the equity method, the interests in joint ventures are initially recognized at acquisition costs. After this the carrying value of the interests goes up or down according to the share of the group in profit or loss as well as in any changes in the other comprehensive income of the joint venture. If the share in the losses of a joint venture exceeds the carrying value of the joint venture (including all long term interests which are to be allocated to the commercial substance after the net investment of the group in the joint venture), then the group is not to recognize the excessive loss share unless it has entered into legal or constructive obligations for the joint venture or has made payments for the joint venture.

Unrealized gains or losses from transactions between group companies and joint ventures are to be eliminated in the consolidated financial statements in the amount of the share of the group in the joint venture. Unrealized losses are not eliminated if the transaction gives any indication that there may be an impairment of the asset transferred.

### 2.4 Associates

Associates are entities in which the group has a significant but not a controlling influence, generally accompanied by a shareholding of between 20 % and 50 % of the voting rights. Associates are reported using the equity method and initially recognized at acquisition costs. Following the acquisition date, the share of the company in the result of the associate is recorded in the statement of comprehensive income and the share of changes in other comprehensive income is recognized in other comprehensive income with a corresponding adjustment being made to the carrying amount of the interest. Dividends received from the affiliated company reduce the carrying amount of the interest. Goodwill on acquisition of associates is included in the investment in associates, net of any impairment losses.

If the percentage of shares held in an associate is reduced but significant influence is retained, only a proportionate share of the amounts previously recognized in other comprehensive income is reclassified to the profit or loss for the period where appropriate.

The accumulated shares of the group in the gains and losses as well as the other comprehensive income of the associate following acquisition are offset against the carrying amount of the interest. When the group's share of losses in an associate equals or exceeds its interest in the associate, including any other unsecured receivables, the group does not recognize further losses unless it has incurred obligations or made payments on behalf of the associate.



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At each balance sheet date the group checks whether there are any indications showing that the investment in an associate is impaired. If this is the case, the impairment requirement is determined as the difference arising from the carrying amount of the interest of the associate and the corresponding recoverable amount and recognized separately in the statement of comprehensive income. Significant unrealized gains from transactions between the group and associates are eliminated to the extent of the group's interest in the associates. Unrealized losses are also eliminated unless the transaction provides evidence of an impairment of the asset transferred.

### **3 Business combinations.**

The group uses the acquisition method of accounting to account for business combinations as at the acquisition date. The acquisition date relates to the date of transfer of control to the group.

The consideration transferred for the acquisition is the fair value of the assets transferred, the equity interests issued by the group and the liabilities incurred or assumed as at the transaction date. The consideration transferred includes the fair value of any asset or liability resulting from a contingent consideration arrangement. Acquisition-related costs are expensed in full as incurred.

In accordance with IFRS 3, any assets acquired and liabilities (including contingent liabilities) assumed in a business combination are measured at their full fair values as at the acquisition date, irrespective of the extent of any non-controlling interests. Intangible assets are recognized separately from goodwill if they are separable from the entity or result from statutory, contractual or other legal rights. No new restructuring provisions may be recognized within the scope of the purchase price allocation. Any remaining positive differences, which compensate the seller with market opportunities that cannot be identified more closely and with development potential, are capitalized as goodwill in the respective cash generating unit (CGU).

Any contingent consideration to be transferred by the group is recognized at fair value as at the acquisition date. Subsequent changes to the fair value of the contingent consideration that is deemed to be an asset or liability is measured in accordance with IAS 39 and a resulting profit or loss recognized in the statement of comprehensive income. Contingent consideration that is classified as equity is not re-measured, and its subsequent settlement is accounted for within equity. Any contingent consideration included in the financial statements resulting from business combinations prior to the application of IFRS 3 (2008) is still treated in accordance with the requirements under IFRS 3 (2004).

If the combination is achieved in stages, the equity capital share previously held in the acquired company by the acquirer is remeasured at the fair value as at the acquisition date. Any resulting profit or loss is to be charged to be credited or charged to the income statement.

Any hidden reserves and liabilities uncovered are carried forward in line with the corresponding assets and liabilities.

The determination of the fair values requires certain estimates and assumptions, in particular of the acquired intangible assets and property, plant and equipment, of the liabilities assumed as well as of the useful lives of the acquired intangible assets and property, plant and equipment.

The group recognizes any non-controlling interest in the acquiree on an acquisition-by-acquisition basis, either at fair value or at the non-controlling interest's proportionate share of the recognized amounts of the acquiree's net assets.

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The group determines the goodwill at the acquisition date as:

- ▶The fair value of the consideration transferred – if necessary plus
- ▶The value recognized of all recognized non-controlling interests in the acquiree – plus
- ▶The fair value of the acquirer's previously held equity interest in the acquiree if the combination is achieved in stages – less
- ▶The net amount (in general of the fair values) of the identifiable assets acquired and liabilities assumed and contingent liabilities.

If the excess is negative, a gain on a bargain purchase is recognized directly in the result for the period.

## **4 Foreign currency translation.**

Items included in the financial statements of each of the group's entities are measured using the currency of the primary economic environment in which the entity operates (functional currency). The consolidated financial statements are presented in euros, which is the Kapsch group's presentation currency.

### **4.1 Translation of financial statements in foreign currencies**

In accordance with IAS 21, financial statements of foreign subsidiaries which are included in the consolidated financial statements are translated as follows:

The statement of comprehensive income of foreign entities (except for foreign entities from hyperinflationary countries) that have a functional currency different from the euro are translated into the group's presentation currency at average exchange rates of the fiscal year, balance sheets at the prevailing mean exchange rate at the balance sheet date. The reference rates of the European Central Bank (ECB) and Deutsche Bundesbank, which are accessible via the Austrian Central Bank's (Österreichische Nationalbank) website, serve as the basis for the translation. If no current exchange rates are available, this will result in the exchange rates as disclosed by the national banks being used. Differences arising from the currency translation of foreign operations into euros are recognized under other comprehensive income and collected under equity.

Exchange differences arising from the translation of the net investment subsidiaries are recognized in shareholders' equity under currency translation differences. When a foreign entity is sold, such exchange differences are recognized in the statement of comprehensive income as part of the gain or loss on disposal of shares in subsidiaries.

Goodwill and adjustments to the fair value in connection with the acquisition of a foreign company are treated as the assets and liabilities of the foreign company in question and converted in the course of initial consolidation at the transaction rate and subsequently converted with the key date exchange rate as at the financial statements key date of the business operation.

The main exchange rates used during the fiscal year are shown below:

Exchange rates to the euro	Average exchange rate		Exchange rate as at the balance sheet date	
	2014/15	2013/14	2014/15	2013/14
AUD	1.452	1.440	1.415	1.494
CAD	1.440	1.414	1.374	1.523
CZK	27.580	26.421	27.533	27.442
PLN	4.181	4.216	4.085	4.172
SEK	9.213	8.739	9.290	8.948
USD	1.265	1.338	1.076	1.379
ZAR	13.950	13.617	13.132	14.588

In the fiscal year 2011/12, Kapsch Telematic Services IOOO, Minsk, Republic of Belarus, was founded. As at the balance sheet date of 31 March 2015, the Republic of Belarus is still classified as a hyperinflationary economy. The group analyzed if IAS 29 (Financial reporting in hyperinflationary economies) had to be applied to the subsidiary. Since the euro, and not the Belorussian ruble (BYR), is the functional currency, the classification of the Republic of Belarus as a hyperinflationary economy has no impact on the accounting of the Belorussian subsidiary and thus also does not affect the present consolidated financial statements. IAS 29 is therefore not applied.

#### 4.2 Foreign currency transactions

Transactions in foreign currencies are translated into the functional currency at the exchange rate as at the transaction date or, in case of new measurements, as at the time of the measurement. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies are recognized in the statement of comprehensive income. Non-monetary items in the balance sheet are translated at historical exchange rates; non-monetary items which were recognized at their lower net realizable value are translated at the exchange rate prevailing at the time of measurement.

Foreign exchange gains and losses which are attributable to cash and cash equivalents as well as borrowings are presented in the statement of comprehensive income within finance income or cost. All other foreign exchange gains and losses are presented in the statement of comprehensive income in other operating income or other operating expenses.

This excludes foreign exchange gains and losses from monetary items to be received from/to be paid to foreign operations as part of a net investment in a foreign operation. Such foreign exchange gains and losses are initially recognized in other comprehensive income and are then reclassified from equity to profit or loss if the net investment is sold. In the fiscal year 2013/14, two USD loans granted by Kapsch TrafficCom AG to US subsidiaries were classified as net investments in a foreign operation pursuant to IAS 21 since the management board of the Kapsch TrafficCom AG does not plan for a redemption of these loans in the foreseeable future and since such redemption is not likely to occur. The exchange rate differences arising from these loans are recognized in other comprehensive income (see Note 10).

## 5 Risk management.

The group's activities expose it to a variety of financial risks, particularly foreign exchange risk, interest rate risk and credit risk. The group's risk management focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the group's financial performance. The group does not employ hedge accounting as envisaged by IAS 39.

### 5.1 Foreign exchange risk

The foreign exchange risk originates from future business transactions, assets and liabilities as well as net investments of foreign business locations if business transactions are executed in a currency or could come about in the course of normal business operations which are not in conformity with the functional currency of the respectively subsidiary (hereinafter referred to as "foreign currency").

The group operates internationally and is exposed to foreign exchange risk arising from various currency exposures, primarily with respect to the Czech crown, the Polish zloty, the South African rand and the US dollar. Because the terms of agreement are stipulated in euros, no foreign exchange risk arises to the group with regard to the Belorussian ruble. Customer orders are mainly invoiced in the local currencies of the group companies. Only in cases in which the group expects to be exposed to significant foreign exchange risk, will major orders denominated in foreign currencies be hedged by forward foreign exchange contracts.

If the exchange rate of the stated currencies (resulting from current and non-current receivables and payables) as of 31 March 2015 (31 March 2014) had increased by the percentage rate ('volatility') stated below, the result before tax, provided all other variables had remained unchanged, would have been higher (+) or lower (-), respectively, by the following amounts:

Currency	Volatility	Effect on equity in TEUR	
		2014/15	2013/14
AUD	10%	167	274
CAD	10%	1,872	1,680
CZK	10%	227	71
EUR	10%	-4,145	-2,629
PLN	10%	364	207
SEK	10%	456	567
USD	10%	4,241	3,181
ZAR	10%	1,076	1,334

The group is exposed to foreign exchange risk from one significant AFS instrument (Q-Free ASA, Norway) as the share is traded in Norwegian crown on the Oslo Stock Exchange.

Currency	Volatility	Effect on equity in TEUR	
		2014/15	2013/14
NOK	+10%	-1,754	-2,159
NOK	-10%	2,143	2,639

## 5.2 Interest rate risk

Interest rate risk is the risk arising from fluctuations in the value of financial instruments, other balance sheet items (e.g. receivables and payables) and/or cash flows due to fluctuations in the market interest rates. For fixed-interest balance sheet items, the risk comprises the present value risk. In case the market interest rate for the financial instrument fluctuates, either a profit or a loss may result if the financial instrument is sold prior to maturity.

In the case of variable-interest balance sheet items, the risk relates to the cash flow. With variable-interest financial instruments, adjustments in the interest rates may result from changes in the market interest rates. Such changes would entail changes in interest payments. Variable-interest (both current and non-current) financial liabilities account for approximately 40 % of interest-bearing financial liabilities. If the market interest rate had been 100 basis points higher (lower) as of 31 March 2015, this, as in the prior year, would not have had any material impact on the result of the group.

Derivative instruments in an insignificant proportion exist in the group to minimize interest rate risk of financial liabilities (see note 21).

## 5.3 Credit risk

As part of the group's risk management policy, the group only engages in business relationships with third parties deemed to be creditworthy and has implemented policies to ensure that the group sells only to customers with appropriate credit histories. In addition, the group monitors its receivables balances on an ongoing basis in order to limit its exposure to bad debts. There is usually a credit risk in the implementation phase of large toll collection projects. With the exception of the toll collection projects in the Czech Republic, South Africa, Poland and the Republic of Belarus (see note 18), there is no concentration of credit risk relating to trade receivables, since the group generally has a large number of customers worldwide. Based on the group's experiences, the default risk for trade receivables can be considered low.

The maximum credit risk is similar to book values:

<b>All amounts in TEUR</b>	<b>2014/15</b>	<b>2013/14</b>
Other non-current financial assets and investments	23,099	28,506
Other non-current assets	28,138	71,113
Current securities	5,291	4,924
Trade receivables and other current assets	205,387	209,721
Cash and cash equivalents	96,765	57,731
	<b>358,680</b>	<b>371,995</b>

## 5.4 Liquidity risk

The Kapsch TrafficCom group attaches considerable importance to the ongoing monitoring, control and measurement of financial and liquidity positions in order to reduce financial risk. This crucial task is carried out at the level of the operational entities, is monitored and optimized in the overall group.

The group controls liquidity risks predominantly by maintaining suitable financial reserves, by issuing bonds, through customer pre-payments and the continuous reconciliation of the terms of receivables, liabilities and financial assets. To this end, cash flow forecasts are made at regular intervals for short-term periods (the next 12 weeks), on a quarterly basis for the medium term (current fiscal year) as well as for long-term periods (in accordance with long-term payment obligations, particularly those arising from loans). Suitable measures for ensuring sufficient liquidity are then deducted from these forecasts.

Furthermore, the management monitors the rolling forecasts of the group's liquidity reserves to ensure that it has sufficient liquidity to meet operational needs and also to secure an adequate scope of unutilized credit lines at any time. The Kapsch TrafficCom group holds high amounts of cash which also serve as a liquidity reserve. As a result, the group's liquidity situation is currently good.

The Kapsch TrafficCom group endeavors to reduce the payment default risk of customers as far as possible by mandatory creditworthiness checks prior to the signing of orders and additionally for major projects by securing payments through guarantees. It cannot be completely ruled out, however, that some defaults might still occur, which would then have a major negative impact on the development of the results and liquidity of the Kapsch group.

The Kapsch TrafficCom group avoids becoming dependent on individual banks by making sure that the financial structure is always distributed over several partner banks. Major repayment obligations (pertaining as a rule to long-term contracts, e.g. in the case of corporate bonds or long-term loans with redemption at maturity) are monitored on an ongoing basis. At an early stage, measures are taken to ensure that the agreed-upon payment obligations are met (either by checking the income from operational cash flow or through timely refinancing activities).

The Kapsch TrafficCom group employs a risk-averse investment strategy. Liquid funds are held such that they are generally available in the short term and can therefore be used quickly whenever needed. When it comes to securities, conservative securities funds, which are actively managed on an ongoing basis and include an appropriate share of bonds, are used as a rule for the coverage and hedging of pension obligations. In the event of international financial market turbulence, however, the financial investments made might still develop unfavorably or individual securities might even become untradeable. This might result in reductions in value and impairments, which in turn have a negative impact on the financial result and equity of the Kapsch TrafficCom group. Such a crisis also increases the default risk of individual issuers of securities or their customers. In addition, the group might for strategic reasons acquire a direct interest in individual entities by purchasing shares. A sufficiently bad performance of these entities might also necessitate an impairment, which in turn leads to the mentioned negative impact on the financial result and equity.

## 5.5 Equity price risk

The group is exposed to equity securities price risk resulting from a material investment, since a Norwegian investment (Q-Free ASA, Norway), is classified as available for sale in the consolidated balance sheet.

The table below summarizes the impact of increases/decreases in the stock price of Q-Free ASA, Norway, on the equity. The analysis is based on the assumption that the stock price increases/decreases by 10% with all other variables held constant.

ISIN	Volatility	Effect on equity in TEUR	
		2014/15	2013/14
NO0003103103	+10%	1,929	2,375
NO0003103103	-10%	-1,929	-2,375

## 5.6 Commodity price risk

The group is not exposed to any material commodity price risks.

## 6 Capital management.

Capital management is carried out in line with value-driven and sustainable corporate governance on the basis of the profit and loss accounts of the individual business segments. Accounting ratios and other economic criteria as well as the long-term development of the group are also monitored and taken into account with regard to corporate governance. A crucial ratio for the capital structure is the gearing ratio calculated as the ratio of net debt to equity. Net debt (net assets) comprises current and non-current borrowings less cash on hand, bank balances and current securities. The Kapsch group's capital management strategy aims among other things to ensure that the group companies' capital resources comply with local requirements. Furthermore, the group focuses on maintaining the gearing ratio on an annual average within a range from 25 % to 35 % in order to be still able to borrow at reasonable cost. The group also continuously monitors if all covenants comply with credit agreements. The highly volatile project business may, nonetheless, be responsible for the gearing ratio strategy and/or the required covenants not being complied with under certain circumstances. In contrast to the previous fiscal year the gearing ratio as of 31 March 2015 reached 16 % (31 March 2014: 44 %), which was even better than the targeted range by the group.

In the reporting year, all external capital requirements resulting from the project financing of the nationwide truck toll collection system in the Republic of Belarus were fulfilled.

The objective of these measures is to safeguard the ability to continue as a long-term going concern in order to show to shareholders and other stakeholders that their requirements can be fulfilled in a high-quality and sustainable manner and that returns for shareholders and benefits for other stakeholders can be provided. Other essential objectives of the group's capital management include the financing of the envisaged growth path and the maintenance of an optimal capital structure.

All amounts in TEUR	2014/15	2013/14
Non-current financial liabilities	88,985	109,494
Current financial liabilities	48,969	46,560
<b>Total financial liabilities</b>	<b>137,954</b>	<b>156,054</b>
Cash on hand and at banks	96,765	57,731
Current securities	5,291	4,924
<b>Net assets /Net debt</b>	<b>-35,898</b>	<b>-93,398</b>
Equity	219,361	213,110
<b>Net gearing</b>	<b>16 %</b>	<b>44 %</b>

## 7 Fair value measurement.

Historical cost is based on the fair value as at the acquisition date. The fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (IFRS 13.9). In measuring the fair value of an asset or a liability, the group takes into account the characteristics of the asset or liability if market participants would take those characteristics into account when pricing the asset or liability at the measurement date (IFRS 13.11).

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To the greatest extent possible, the group uses observable market data for the fair value measurement of assets or liabilities. Depending on the availability of observable input factors and their impact on the fair value measurement as a whole, the fair value is assigned to one of three levels in the following fair value hierarchy:

- ▶ Level 1: Inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the group can access at the measurement date.
- ▶ Level 2: Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
- ▶ Level 3: Inputs at this level are unobservable inputs for the asset or liability (IFRS 13.72ff).

## **8 Borrowing costs.**

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets are added to the cost of those assets, until such time as the assets are substantially ready for their intended use or sale. A qualifying asset is an asset (inventories, manufacturing plants, toll collection projects, power generation facilities, intangible assets and investment in properties) that requires a substantial period of time (with regard to the group at least 12 months) to be made ready for its intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization within a specific period.

In the fiscal year 2014/15, none of the assets recognized by the group met the requirements of a qualifying asset; therefore, no borrowing costs were capitalized.

All other borrowing costs are expensed in the period in which they are incurred.

## **9 Property, plant and equipment.**

Property, plant and equipment are recognized at acquisition and production cost less accumulated depreciation. Depreciation is charged on a straight-line basis over the expected useful lives of the assets in accordance with the group policies:

Properties are not subject to scheduled depreciation. The useful lives generally range between 3 to 26 years for plants and buildings on leasehold land, 4 to 20 years for technical equipment and machinery, and 3 to 10 years for other equipment, factory and office equipment. The assets' useful lives and residual values are reviewed, and adjusted if appropriate, at the end of each reporting period. An asset's carrying amount is written down to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount.

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the group and the cost of the item can be measured reliably. The carrying amount of those assets which were replaced is derecognized. Expenses for repairs and maintenance which do not necessitate a significant replacement investment (i. e. day to day servicing) are charged to the income statement during the financial period in which they are incurred.

The difference between the proceeds from the disposal of property, plant and equipment and the carrying amount is recognized as profit or loss in the result from operating activities.



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## **10 Intangible assets.**

### **10.1 Goodwill**

Goodwill arises on the acquisition of subsidiaries, associates and joint ventures and represents the excess of the consideration transferred for the acquisition beyond the group's interest in net fair value of the identifiable assets, liabilities and contingent liabilities of the acquiree, the fair value of the non-controlling interest in the acquiree and the fair value of the acquirer's previously held equity interest in the acquiree, if the combination is achieved in stages, at the acquisition date. If the acquisition costs are less than the net assets of the acquired subsidiary measured at fair value, the difference is recognized directly in the statement of comprehensive income.

Goodwill impairment reviews are undertaken at least annually or more frequently if events or changes in circumstances indicate a potential impairment. As a rule, the group carries out the annual goodwill impairment review in the fourth quarter. In addition, the group carries out impairment tests during the year if a triggering event occurs that may cause the asset to be impaired.

For the purpose of impairment testing, goodwill is allocated to each of the cash generating units (CGU) or groups of cash generating units which are expected to benefit from the synergies of the business combination and have reported the goodwill. Each unit or group of units to which the goodwill is allocated represents the lowest level within the entity at which the goodwill is monitored for internal management purposes.

The carrying value of goodwill is compared to the recoverable amount, which is the higher of value in use and the fair value less costs to sell. If the carrying value of a CGU exceeds the recoverable amount, an impairment is to be recognized. First, goodwill is amortized by the amount of the impairment. If the impairment exceeds the carrying value of goodwill, the carrying values of the remaining assets of this CGU are proportionately reduced.

The value in use of a cash generating unit corresponds to the present value, calculated using the discount cash flow method, of the future cash flows which the entity will receive from the cash generating unit. In order to determine the value in use, the expected future cash flows plus taxes based on the post-tax discount rate that reflects the current market expectations with regard to the interest effect and the specific risks of the cash generating units, are written down to their present values. In doing so, the current planning covering a period of four years (detailed forecast period) and approved by management is used as the basis with subsequent transition to perpetuity. The growth rates according to the detailed forecast period are based on historical growth rates and on external studies on the future medium-term market development.

The fair value less costs to sell is determined using an appropriate valuation model which is based on the medium-term planning of the respective cash generating unit. The valuation is made in line with the discounted cash flow calculations and verified through suitable multiples, if available.

The impairment loss of goodwill is recognized in the statement of comprehensive income. Write-ups on goodwill are not made.

### **10.2 Concessions and rights**

Computer software, trademarks and similar rights are capitalized on the basis of the costs incurred for acquisition and amortized over their estimated useful lives of 4 to 30 years. Acquired customer agreements (toll contracts, maintenance agreements) are recognized at acquisition costs and amortized over the estimated useful lives that generally range between 2 and 10 years.

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### 10.3 Research and development costs

Research expenditures are recognized as an expense. Costs incurred for development projects (relating to the design and tests of new or improved products) are recognized as intangible assets when the following criteria are fulfilled:

- a) it is technically feasible to complete the intangible asset so that it will be available for use or sale;
- b) management intends to complete the intangible asset and use or sell it;
- c) there is an opportunity to use or sell the intangible asset;
- d) it can be demonstrated how the intangible asset will generate probable future economic benefits;
- e) adequate technical, financial and other resources are available to complete the development and to use or sell the intangible asset; and
- f) the expenditure attributable to the intangible asset during its development can be reliably measured.

Other development expenditures that do not meet these criteria are recognized as an expense. The costs for producing the intangible asset are capitalized as from the point in time when the above criteria are initially met. Development costs previously recognized as an expense cannot be subsequently capitalized. Capitalized development costs are amortized using the straight-line method on the basis of the normal useful life, which generally ranges between three and five years.

Capitalized development assets are tested for impairment annually in accordance with IAS 36, as long as they are not yet available for use.

## 11 Impairment of non-financial assets.

Assets that have an indefinite useful life – for example, goodwill or intangible assets not ready for use – are not subject to amortization and are tested annually for impairment. Assets that are subject to amortization are reviewed for impairment whenever events or changes in circumstances indicate that the asset should be impaired.

An impairment loss is recognized for the amount by which the asset's carrying value exceeds its recoverable amount. The recoverable amount is the higher of an asset's net selling price and its value in use. For the purpose of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows. Assets other than goodwill that suffered impairment are reviewed for possible reversal of the impairment at each subsequent reporting date.

The difference between the recoverable amount of assets and their carrying amount is recognized as income or expense in the result from operating activities. Gains are not classified as revenue.

The residual carrying values and useful lives are reviewed at each balance sheet date and adjusted as necessary.

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## 12 Financial instruments.

Financial instruments are subdivided as follows:

- ▶ Financial assets at fair value through profit or loss
- ▶ Held-to-maturity investments
- ▶ Available-for-sale financial assets
- ▶ Loans and receivables

The classification depends on the nature and purpose of the financial assets and is determined on initial recognition.

Financial assets at fair value through profit or loss are financial assets held for trading. A financial asset is classified in this category if acquired principally for the purpose of selling in the short term. Derivatives are also categorized as held for trading unless they are designated as hedges. Assets in this category are classified as current assets if expected to be settled within 12 months, otherwise they are classified as non-current.

Held-to-maturity investments are non-derivative financial assets with fixed or determinable payments and fixed maturity that an entity has the positive intention and ability to hold to maturity.

Available-for-sale financial assets are non-derivatives that are either designated in this category or not classified in any of the other categories. They are included in non-current assets unless the investment matures or management intends to dispose of it within 12 months of the end of the reporting period.

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. They are included in current assets, except for maturities greater than 12 months after the end of the reporting period. These are classified as non-current assets.

### 12.1 Securities and investments

Financial assets recognized under non-current assets and other short-term financial assets include available-for-sale securities, investments and financial assets at fair value through profit or loss.

#### **Available-for-sale securities and investments (AFS)**

Available-for-sale securities and investments are carried at fair value. Unrealized gains and losses arising from the changes in fair value of available-for-sale securities and investments are recognized in other comprehensive income.

The difference arising on the sale of financial assets between the proceeds and the carrying amounts is taken through profit or loss in the statement of comprehensive income. Additionally, the amount recognized in equity is taken through profit or loss in the statement of comprehensive income. All acquisitions and sales are recognized at the respective date of the transaction, with transaction costs being included in acquisition costs.

The group assesses at each balance sheet date whether there is objective evidence of impairment of each significant individual financial asset or group of financial assets.

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If such evidence exists the group accounts for such impairment, and the amounts of the available-for-sale financial assets previously recognized in equity are removed from equity and recognized through profit or loss in the statement of comprehensive income. The cumulative loss reclassified from equity to profit or loss is the difference between the acquisition cost and the current fair value, less any impairment loss on that financial asset previously recognized in profit or loss.

If, in subsequent periods, the fair value of the impaired financial instrument increases and such increase is directly related to an event occurring after the impairment was recognized through profit or loss in the statement of comprehensive income, the group reverses the impairment loss. In the case of debt instruments, the reversal is recognized in the profit for the period in the statement of comprehensive income; in the case of equity instruments, it is recognized directly in equity.

#### **Financial assets at fair value through profit and loss**

Financial assets at fair value through profit and loss are carried at fair value. Unrealized gains and losses arising from the changes in fair value of financial assets at fair value through profit or loss are recognized immediately in the statement of comprehensive income.

#### **12.2 Other investments**

Other available-for-sale investments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured are initially carried at cost less transaction costs and are recognized at the reporting date less any impairments made.

At each balance sheet date, the group assesses whether there is objective evidence that a financial asset or a group of financial assets is impaired. If such evidence exists, the amount of the loss is measured as the difference between the financial asset's carrying amount and the present value of estimated future cash flows discounted at the current market rate of a comparable financial asset. Such impairments must not be reversed.

#### **12.3 Derivative financial instruments**

For accounting purposes, derivative financial instruments are treated as stand-alone derivatives (i. e. as independent transactions and not as hedging transactions). Therefore they qualify as held-for-trading financial instruments and are valued at fair value through profit or loss as attributable as at the date of contract conclusion. The fair value corresponds to the value which the relevant entity would receive or have to pay upon liquidation of the deal on the balance sheet date. Positive market values at the balance sheet date are recognized under financial assets, and negative market values under other liabilities.

Changes in the fair value of these derivative financial instruments are recognized immediately in the statement of comprehensive income within other income or expense or the financial result, depending on the derivative financial instrument's purpose.

The group does not employ hedge accounting as envisaged by IAS 39.

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## **12.4 Loans and receivables**

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Loans and receivables (e.g. trade receivables, other receivables, cash on hand and at banks) are initially recognized at fair value plus transaction costs and subsequently measured at amortized cost using the effective interest method, less allowance for bad debts.

At each balance sheet date, the group assesses whether there is objective evidence that a financial asset or a group of financial assets is impaired. Evidence of impairment may include the following: indications that the debtors or a group of debtors is experiencing significant financial difficulties, default or delinquency in interest or principal payments, the probability that they will enter bankruptcy or other financial reorganization, and where observable data indicate that there is a measurable decrease in the estimated future cash flows, such as changes in arrears or economic conditions that correlate with defaults. The amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows (excluding future credit losses that have not occurred) discounted at the financial asset's original effective interest rate.

The amount of the loss is recognized in the statement of comprehensive income.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related to an event occurring after the event was recognized, the reversal of the previously recognized impairment loss is recognized in the statement of comprehensive income.

## **13 Leases.**

### **13.1 Finance leases – Accounting for agreements from the lessee's perspective**

Leasing agreements in which the group as the lessee bears a substantial part of the risks and rewards associated with the use of an asset are accounted for as finance leases.

The respective assets are capitalized under non-current assets at the net present value of minimum lease payments or the fair value of the leased asset, whichever is lower, and are depreciated over their expected useful lives. A liability with regard to finance leases is recognized in the same amount. The difference between the minimum lease payments and the accrued net present value is recognized as deferred interest expense. The interest component is spread over the agreed term of the lease using the effective interest rate method.

### **13.2 Operating leases – Accounting for agreements from the lessee's perspective**

Leases in which a substantial part of the risks and rewards associated with the use of an asset are retained by the lessor are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are charged as rental expense to the statement of comprehensive income on a straight-line basis over the period of the lease.

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## **14 Government grants.**

Government grants with regard to purchased non-current assets (technical equipment) are deferred and taken through profit or loss over the estimated useful life of the respective asset. Government grants are recognized at their fair value where there is reasonable assurance that the group will comply with all attached conditions and the grant will be received.

Other government grants received as compensation for expenses or losses already incurred are immediately taken through profit or loss.

## **15 Inventories.**

Inventories are stated at cost or, if lower, the net realizable value. Cost is determined using the moving average price method. Production cost includes all directly attributable expenses and fixed and variable overheads (based on normal operating capacity) incurred in connection with the production. It excludes, however, borrowing costs as they cannot be allocated to a qualifying asset. Net realizable value is the estimated selling price in the ordinary course of business less applicable variable selling expenses.

## **16 Construction contracts.**

The group accounts for construction contracts in accordance with IAS 11. When the outcome of a construction contract can be estimated reliably and it is probable that the contract will be profitable, contract revenue is recognized over the period of the contract. When it is probable that total contract costs will exceed total contract revenue, the expected loss is recognized as an expense immediately. The construction progress is represented by the ratio of costs incurred by the balance sheet date and the estimated total costs for the respective project.

If the result of the construction contract cannot be reliably determined, contract revenue will only be recognized in the amount of the contract costs incurred which are likely to be recoverable. Contract costs are recognized as expenses in the period in which they occur.

The carrying amount results from comparing the total of accumulated costs incurred by the balance sheet date plus the profit calculated according to the percentage of completion method (prorated) or loss (in full) on the respective construction contract to the invoiced amounts. Depending on maturity, the balance is recognized either under non-current assets, under current assets (amounts due from customers for contract work) or under current liabilities (amounts due to customers for contract work). Any amounts received prior to the rendering of production services are recognized in the consolidated balance sheet as liabilities under prepayments received.

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## 17 Trade receivables.

Trade receivables are amounts due from customers for merchandise sold or services performed in the ordinary course of business. Trade receivables are recognized initially at fair value and subsequently measured at amortized cost using the effective interest method, less allowance for bad debts. Receivables with a remaining term of up to one year are recognized as current receivables; all others are recognized as non-current receivables. An allowance for bad debts is established when there is objective evidence that the group will not be able to collect all amounts due according to the original terms of receivables. The amount of the allowance is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the effective interest rate. The amount of the allowance is recognized in the statement of comprehensive income. If, in a subsequent period, the amount of the impairment loss decreases and the decrease is related to an event occurring after the impairment was initially recognized, the reversal of the previously recognized impairment loss is recognized through profit or loss.

## 18 Cash and cash equivalents.

In the presentation of the cash flow statement, cash and cash equivalents include cash on hand, deposits held at call and other cash at banks. Overdrafts are recognized in the balance sheet under current financial liabilities.

## 19 Provisions.

Provisions are set up when the group has a present legal or constructive obligation to third parties as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and a reliable estimate of the amount can be made. If such a reliable estimate is not possible, no provisions are set up. Provisions are measured based on the present value of the estimated settlement amount. The settlement amount is the best possible estimate of an expense on the basis of which a current obligation might be settled at the balance sheet date or transferred to a third party. This estimate takes into account future cost increases that are foreseeable and likely to occur on the balance sheet date. If they are material, provisions are discounted using a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the obligation. The increase in the provision due to passage of time is recognized as interest expense.

Provisions for warranties and liabilities for construction flaws, serial and systems problems mainly serve as coverage for obligations for free repairs and replacement deliveries, in accordance with the general sales and delivery conditions or due to individual agreements, and are measured on the basis of the group of obligations, using rates based on past experience regarding direct labor and material costs incurred, overheads, replacement deliveries or rebates. A provision is recognized for the best estimate of the costs incurred for defects to be rectified under the warranty for products sold before the balance sheet date.

Provisions for onerous contracts are recognized if the expected benefit to be derived from the contract is less than the unavoidable costs of meeting the obligations under the contract. The provision is measured at the present value of the amount from the fulfillment of the contract or any compensation payments in case of non-performance, whichever is lower. The recognition of impairment losses on assets dedicated to such "onerous" contracts is, however, established prior to the recognition of the provisions for onerous contracts.

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## 20 Employee benefits.

The group provides various post-employment benefits to employees and other long-term benefits either based on individual agreements or in accordance with local labor law provisions.

A defined contribution plan is a pension plan under which the group pays fixed contributions into a separate non-group entity (fund). The group has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee service in the current and prior periods. A defined benefit plan is a pension plan that is not a defined contribution plan.

Typically, defined benefit plans define an amount of pension benefit that an employee will receive on retirement, usually dependent on one or more factors such as age, years of service and compensation.

The projected unit credit method is used for the calculation of liabilities arising from pension obligations and termination benefits in accordance with IAS 19. According to this method, post-employment costs for employee benefits are recognized in the statement of comprehensive income in such a way that scheduled costs are spread over the employees' years of service on the basis of an expert opinion by a qualified actuary, who completely re-measures the schemes annually. The obligations for pension payments are calculated as the present value of future benefits using interest rates of high-quality corporate bonds whose term roughly equals the term of the liability. The liability recognized in the balance sheet with respect to defined benefit pension plans is the present value of the defined benefit obligation at the end of the reporting period less the fair value of plan assets.

Costs arising from defined benefit plans from pension obligations and termination benefits include the following components:

- ▶ Service costs include current as well as past service costs as well as gains or losses from benefit changes or curtailments. Service Costs are recognized in profit or loss within staff costs.
- ▶ The net interest cost on the defined benefit obligation or plan asset. This component is included in interest expense in the statement of comprehensive income.
- ▶ Remeasurements of the net defined benefit obligation or net asset. They are charged or credited to other comprehensive income in the period in which they arise.

Contributions paid by the group under a defined contribution pension scheme are charged to the statement of comprehensive income under staff costs in the period in which they occur.

For the calculation of liabilities arising from obligations for jubilee bonuses in accordance with IAS 19, the projected unit credit method is used. Jubilee bonuses are special lump-sum payments stipulated in the Collective Agreement and dependent on compensation and years of service. Eligibility is determined by a certain number of service years. The calculation of liabilities arising from obligations for jubilee bonuses is performed in a similar way as the calculation for liabilities arising from termination benefits.



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## 21 Current and deferred income tax.

The tax expense for the period comprises current and deferred tax. Tax is generally recognized in the statement of comprehensive income. Only taxes that relate to items recognized in other comprehensive income are recognized in other comprehensive income.

The current income tax charge is calculated on the basis of the tax laws applicable at the balance sheet date in the countries where the subsidiaries and associates operate and generate taxable income.

Deferred income tax assets/liabilities are provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, if the deferred income tax assets/liabilities arise from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither IFRS profit or loss nor taxable profit or loss, it is not accounted for. Likewise, deferred taxes are not recognized if they arise from the initial recognition of goodwill.

Deferred income tax assets/liabilities are determined using tax rates (and laws) that have been enacted or substantially enacted by the balance sheet date and are expected to apply when the related deferred income tax asset is realized or the deferred income tax liability is settled.

Deferred income tax assets are recognized to the extent that it is probable that future taxable profit will be available against which the temporary differences can be utilized. In addition, it is to be assumed that such temporary differences will be reversed in the foreseeable future.

The carrying value of deferred income tax assets is reviewed annually at the balance sheet date and impaired if it is no longer likely that sufficient taxable income will be available to realize such assets partially or in full.

Temporary differences mainly arise in connection with depreciation (amortization) periods of non-current assets, provisions for pension benefits, other post-employment benefits, differences regarding the measurement of receivables and payables and tax loss carry-forwards.

Deferred income tax assets/liabilities are provided on temporary differences arising on investments in subsidiaries and associates, except where the timing of the reversal of the temporary difference is controlled by the group and it is probable that the temporary difference will not be reversed in the foreseeable future.

Taking into account the corresponding terms, deferred income tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income taxes assets and liabilities relate to income taxes levied by the same taxation authority on the same taxable entity.

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## 22 Liabilities.

Liabilities are recognized at amortized cost using the effective interest rate method. Liabilities with a remaining term of up to one year are recognized as current liabilities, those with longer terms are recognized as non-current liabilities. Liabilities denominated in foreign currencies are measured at the current rate at the balance sheet date. Borrowings are initially recognized at fair value, net of transaction costs incurred, and subsequently stated at amortized cost. Borrowing costs are charged to the statement of comprehensive income in the period in which they are incurred.

## 23 Contingent liabilities.

Contingent liabilities occur for two reasons. For one, they comprise possible obligations that arise from past events and whose existence will be confirmed by uncertain future events that are at least partly beyond the group's control. For another, they comprise present obligations that fail to meet general or special recognition standards (i.e. the amount of an obligation cannot be measured with sufficient reliability or an outflow of resources to settle the obligations is not deemed probable).

The group discloses contingent liabilities unless the possibility of an outflow of resources embodying economic benefits is remote and a liability does not have to be recognized pursuant to IFRS.

## 24 Revenue recognition.

In accordance with IAS 18, revenue is recognized at the fair value of the compensation received or outstanding in the statement of comprehensive income upon delivery and once the significant risks and rewards of ownership of the goods are transferred to the customer, net of discounts, other price reductions and eliminated sales within the group.

Revenues from sales of services are recognized in the reporting period in which the services are rendered, by reference to the rate of completion of the specific transaction assessed on the basis of the actual service provided as a proportion of the total services to be provided.

Revenues from sales of maintenance relate to the services under the single maintenance contracts rendered in the respective reporting period.

Revenue for construction contracts (mainly toll collection projects) is recognized in accordance with the percentage-of-completion method provided the conditions under IAS 11 are met.

Other revenue is recognized by the group as follows:

- ▶ Revenue from expenses recharged is recognized on the basis of the accumulated amounts in accordance with the respective agreements.
- ▶ Interest income is recognized on a time-proportion basis using the effective interest method.
- ▶ Dividend income is recognized when the right to receive payment is established.

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## **25 Material accounting estimates and assumptions with regard to accounting policies.**

The group makes estimates and assumptions concerning the future development. The resulting accounting estimates will, by definition, rarely equal the related actual results. All estimates and judgments are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

In particular, estimates and assumptions regarding revenue recognition have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next fiscal year.

### **25.1 Percentage-of-completion method for contract work**

The group uses the percentage-of-completion method in accounting for its construction contracts. At the balance sheet date of 31 March 2015, the amounts due from customers for contract work amounted to TEUR 110,983 (2013/14: TEUR 92,102) and the amounts due to customers for contract work amounted to TEUR 17,786 (2013/14: TEUR 14,756). The use of the percentage-of-completion method requires the group to estimate the expected profit mark-up for the construction contract. Sensitivity analyses on assumptions made by the executive board of Kapsch TrafficCom AG indicate that the operating result would fluctuate by TEUR 10,104 (2013/14: TEUR 8,923) and the total comprehensive income for the period would fluctuate by TEUR 7,578 (2013/14: TEUR 6,692) if the actual margin of the significant projects deviated by 10% from estimates. The analysis of assumptions made in the past as well as of actual profit mark-ups showed that the estimates had been reliable up to now.

### **25.2 Estimated impairment of goodwill**

In accordance with the accounting policy stated in note 3, the group tests annually whether goodwill has suffered any impairment. The recoverable amount of cash generating units is determined on the basis of the calculation of the value in use. These calculations require the use of estimates.

Sensitivities for the acquired goodwill are detailed in note 13.

### **25.3 Further assumptions and estimates**

Further areas where assumptions and estimates are significant to the consolidated financial statements include inventories, deferred income tax assets/liabilities, liabilities from post-employment benefits to employees and provisions for warranties, project risks and losses. Sensitivity analyses of the assumptions made by management in connection with inventories, deferred income tax assets/liabilities and provisions indicate that no material effect will arise if the actual final outcomes were to differ from the estimates made by 10%.

The sensitivities for obligations for post-employment benefits to employees are detailed in note 23.

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## **26 Critical judgments in the application of accounting policies.**

As a non-financial entity, the group does not have a major investment portfolio and currently holds only one significant AFS financial instrument (Q-Free ASA, Norway); refer to Note 15. Against this backdrop, no fixed rates or time bands were defined to establish whether a “significant” or a “prolonged” decline in accordance with IAS 39.61 exists. As a consequence, the Group measures equity instruments classified as “available for sale” on an individual basis, taking particularly into account qualitative criteria (e.g. volatility of equity instruments held, trading volume or adverse developments of the issuer). It is especially with instruments of lower liquidity and/or high volatility that higher percentages (of up to 30 %) are used to establish whether a decline in value is considered to be “significant”.

## **27 Segment information.**

The reporting on operating segments is consistent with the internal reporting provided to the chief operating decision-maker (management approach). The chief operating decision-maker is responsible for allocating resources to the operating segments and assessing their performance. The executive board has been identified as the chief operating decision-maker.

# Notes to the Consolidated Financial Statements.

Figures in the disclosure notes are presented in euro thousands (TEUR) unless otherwise stated.

## 1 Segment Information.

### Operating segments

The group reports three operating segments (see section "General Information"):

- ▶ Road Solution Projects (RSP)
- ▶ Services, System Extensions, Components Sales (SEC)
- ▶ Others (OTH)

The segment information follows the same principles and same accounting policies as applied in these consolidated financial statements.

The segment results for the fiscal year ended 31 March 2015 are as follows (in EUR million):

	RSP	SEC	OTH	Consolidated group
Revenues	60.2	372.6	23.6	456.4
Operating result	-50.7	82.2	1.3	32.7

The segment results for the fiscal year ended 31 March 2014 are as follows (in EUR million):

	RSP	SEC	OTH	Consolidated group
Revenues	132.0	331.8	23.1	487.0
Operating result	-34.6	53.8	1.1	20.3

The segment assets and liabilities as of 31 March 2015 as well as capital expenditure, depreciation, amortization and impairment and other non-cash-effective positions for the period then ended are as follows (in EUR million):

	RSP	SEC	OTH	Consolidated group
Assets	180.9	185.3	8.6	374.8
Investments in associates	0.5	1.5	0.0	2.0
Liabilities	32.8	122.6	0.6	155.9
Capital expenditure	0.8	7.5	0.1	8.4
Depreciation, amortization and impairment	14.4	14.0	0.4	28.8
Other non-cash-effective positions	12.9	0.6	0.0	13.5

The segment assets include property, plant and equipment, intangible assets, other non-current assets, inventories as well as trade receivables and other current assets.

The segment liabilities include liabilities from post-employment benefits to employees, non-current provisions, other non-current liabilities, trade payables, other liabilities and deferred income, current tax payables as well as current provisions.

The segment assets and liabilities as of 31 March 2014 as well as capital expenditure, depreciation, amortization and impairment and other non-cash-effective positions for the period then ended are as follows (in EUR million):

	RSP	SEC	OTH	Consolidated group
Assets	209.4	226.0	16.5	452.0
Investments in associates	0.1	1.5	0.0	1.6
Liabilities	60.6	116.8	9.4	186.9
Capital expenditure	3.9	11.8	0.0	15.7
Depreciation, amortization and impairment	2.4	13.8	0.4	16.6
Other non-cash-effective positions	0.2	0.2	0.0	0.4

The breakdown of revenue by customer who contributed more than 10 % to the result for the year is as follows. In addition, the respective segments are shown (in EUR million):

	2014/15			2013/14		
	Revenues	RSP	SEC	Revenues	RSP	SEC
Customer 1	79.2		x	86.1		x
Customer 2	66.4		x	69.8		x
Customer 3	52.5	x	x	55.9	x	x
Customer 4	40.2	x	x	76.1	x	x

#### Information by region

Revenues are segmented by the location of the customer and balance sheet figures by the location of the company.

The figures for the fiscal year ended 31 March 2015 are as follows (in EUR million):

	Europe				Consolidated group
	Austria	(excl. Austria)	America	Rest of World	
Revenues	38.2	234.0	92.6	91.6	456.4
Non-current non-financial assets	17.0	22.3	51.3	3.0	93.6

The figures for the fiscal year ended 31 March 2014 are as follows (in EUR million):

	Europe				Consolidated group
	Austria	(excl. Austria)	America	Rest of World	
Revenues	32.9	300.1	87.0	67.0	487.0
Non-current non-financial assets	18.9	29.4	61.7	3.1	113.0

#### Revenues per category

Revenues are classified into the following categories:

	2014/15	2013/14
Sales of goods	122,072	160,312
Sales of services	367,157	310,125
Sales of maintenance	33,183	35,486
Accrued/deferred sales, license sales and discounts on invoiced sales	-66,035	-18,956
	<b>456,377</b>	<b>486,967</b>

## 2 Other operating income.

	2014/15	2013/14 (adjusted)
Exchange rate gains from operating activities	10,458	5,410
Research tax credits	2,427	2,807
Income from the sale of non-current assets	293	24
Income from costs recharged	106	199
Sundry operating income	7,937	6,787
	<b>21,221</b>	<b>15,227</b>

Sundry operating income mainly relates to the assumption of costs of transactions billed for the nationwide electronic truck toll collection system in the Czech Republic.

## 3 Change in finished and unfinished goods and work in progress.

	2014/15	2013/14
Change in unfinished goods and work in progress	-759	5,261
Change in finished goods	-4,517	-11,237
	<b>-5,276</b>	<b>-5,976</b>

## 4 Costs of materials and other production services.

	2014/15	2013/14
Cost of materials	74,766	87,359
Cost of purchased services	93,268	140,685
	<b>168,034</b>	<b>228,044</b>

## 5 Staff costs.

	2014/15	2013/14
Wages, salaries and other remunerations	121,129	113,162
Expenses for social security and payroll-related taxes and contributions	20,775	21,984
Expenses for termination benefits (see Note 23)	281	230
Expenses for pensions (see Note 23)	11	14
Contributions to pension funds and other external funds (see Note 23)	1,214	772
Fringe benefits	4,693	3,032
	<b>148,102</b>	<b>139,193</b>

As of 31 March 2015, the number of staff amounted to persons 3,545 (31 March 2014: 3,308 persons) and averaged 3,510 persons in the fiscal year 2014/15 (2013/14: 3,172 persons).

## 6 Amortization of intangible assets, depreciation of property, plant and equipment and impairment.

	2014/15	2013/14
Depreciation of property, plant and equipment	7,676	8,715
Amortization of intangible assets	8,758	7,876
Impairment (see Note 13)	12,342	0
	<b>28,776</b>	<b>16,591</b>

## 7 Other operating expenses.

	2014/15	2013/14
Communication and IT expenses	18,862	9,323
Rental expenses	13,073	12,228
Legal and consulting fees	10,860	11,733
Exchange rate losses from operating activities	6,974	8,572
Marketing and advertising expenses	6,959	9,505
Travel expenses	6,840	8,030
Automobile expenses	4,524	5,088
License and patent expenses	3,972	6,244
Maintenance	3,347	3,152
Insurance costs	3,242	3,658
Office expenses	3,025	2,724
Warranty costs and project financing	1,796	2,195
Reorganisation costs	1,760	0
Damages	1,720	22
Training costs	1,714	2,282
Taxes and charges	1,524	1,984
Allowance and write-off of receivables	995	322
Transport costs	939	1,241
Commissions and other fees	515	361
Adjustment of provision for warranties	331	-97
Losses on disposal of non-current assets	227	81
Other	1,564	3,606
	<b>94,763</b>	<b>92,256</b>

The increase in communication and IT expenses by TEUR 9,539 can be attributed mainly to a change in disclosure in the South African entity ETC Pty.

The item "Other" includes membership dues and bank charges as well as other administrative and selling expenses.



## 8 Financial result.

	2014/15	2013/14
<b>Interest and similar income:</b>		
Interest income	1,690	1,355
Income from securities	84	95
Income from interest accretion of non-current receivables	5,946	2,696
Gains from the disposal of financial assets	0	8
Exchange rate gains from financing activities	5,536	1,388
	<b>13,255</b>	<b>5,542</b>
<b>Interest and similar expenses:</b>		
Interest expense	-5,983	-5,504
Impairment of other investments	-18,525	0
Expense from interest accretion of non-current payables	-252	-814
Exchange rate losses from financing activities	-742	-13,269
Interest expense from liabilities from post-employment benefits to employees	-757	-901
Expense from change in fair value of derivative financial instruments	-47	0
	<b>-26,307</b>	<b>-20,489</b>
	<b>-13,051</b>	<b>-14,947</b>

The impairment of other investments in fiscal year 2014/15 concern the impairment, recognized in the interim financial report of the second quarter as impairment in the result for the period, due to the ongoing unfavorable development of the share price of the investment in Q-Free ASA, Trondheim, Norway amounting to TEUR 12,185 (see Note 10) as well as further net exchange losses in the third quarter of the fiscal year 2014/15 amounting to TEUR 6,340. In the fourth quarter of the fiscal year 2014/15 the exchange rate has recovered again and the increase in value was recognized in the other comprehensive income.

The exchange rate gains/losses from financing activities in the group mainly result from exchange rate fluctuations of the translation of intercompany financing of subsidiaries in North America and South Africa.

## 9 Income taxes.

	2014/15	2013/14
Current taxes	-9,909	-10,421
Deferred taxes (see Note 22)	1,385	7,789
<b>Total</b>	<b>-8,524</b>	<b>-2,632</b>
Thereof income/expense from group taxation	-4,641	-4,976

The reasons for the difference between the arithmetic tax expense/(income) based on the Austrian corporate income tax rate of 25 % and the recognized tax expense/(income) are as follows:

	2014/15	2013/14
Result before income taxes	19,932	5,488
Arithmetic tax expense based on a tax rate of 25 % (2012/13: 25 %)	-4,983	-1,372
Unrecognized deferred tax assets on current losses	-14	-3,176
De-recognition of deferred tax assets recognized on prior year losses	0	-1,471
Utilization of previously unrecognized tax losses	2,895	0
Different foreign tax rates	-3,310	2,615
Tax allowances claimed and other permanent tax differences	-4,892	-407
Income and expenses not subject to tax and other differences	1,152	1,576
Adjustment in respect to prior year	628	-396
<b>Recognized tax expense</b>	<b>-8,524</b>	<b>-2,632</b>

In the fiscal year 2014/15 a disproportionate high tax rate arises due to the non-tax effective impairment of the investment in Q-Free ASA, Norway (effects from tax allowances claimed and other permanent tax differences in the amount of TEUR 4,631).

For further information on deferred tax assets and liabilities see Note 22.

## 10 Other comprehensive income.

2014/15	Before taxes	Tax expense/ income	After taxes
Fair value gains/losses on available-for-sale financial assets:			
Unrealized gains/losses in the current period	2,031	-129	1,902
Gains/losses recognized in the result for the period	12,185	0	12,185
Remeasurements of liabilities from post-employment benefits	-3,164	646	-2,519
Currency translation differences	-12,559	0	-12,559
Currency translation differences from net investments in foreign business	9,045	-2,261	6,784
<b>Fair value changes recognized in equity</b>	<b>7,538</b>	<b>-1,744</b>	<b>5,794</b>

The unrealized gains/losses on available-for-sale financial assets relate to market price fluctuations of the investment in Q-Free ASA, Norway, amounting to TEUR 1,516.

The realized gains/losses on available-for-sale financial assets relate to an impairment in that investment, recognized in the result of the period (TEUR 12,185, reclassification from other comprehensive income to the result of the period, see note 8) due to ongoing unfavorable development of the share price.

2013/14	Before taxes	Tax expense/ income	After taxes
Fair value gains/losses on available-for-sale financial assets:			
Unrealized gains/losses in the current period	-7,814	-109	-7,923
Remeasurements of liabilities from post-employment benefits	-465	37	-428
Currency translation differences	-3,947	0	-3,947
Currency translation differences from net investments in foreign business	-644	161	-483
<b>Fair value changes recognized in equity</b>	<b>-12,869</b>	<b>89</b>	<b>-12,781</b>

## 11 Additional disclosures on financial instruments by category.

### 11.1 Assets

	Note	2014/15	2013/14 (adjusted)
<b>At fair value through profit or loss</b>			
Derivative financial instruments	—	0	0
		<b>0</b>	<b>0</b>
<b>Financial instruments held-to-maturity</b>			
Securities held-to-maturity	—	0	0
		<b>0</b>	<b>0</b>
<b>Receivables (financial assets recognized at (amortized) cost)</b>			
Non-current receivables	(16)	1,151	2,175
Loans (other non-current assets)	(15)	0	1,093
Trade receivables	(18)	72,754	137,885
Cash and cash equivalents	(19)	96,765	57,731
		<b>170,670</b>	<b>198,884</b>
<b>Available-for-sale financial assets</b>			
Available-for-sale securities (non-current), Level 1	(15)	3,085	2,906
Available-for-sale securities (non-current), Level 2	(15)	718	749
Available-for-sale investments, Level 1	(15)	19,291	23,753
Available-for-sale securities (current), Level 1	(15)	5,291	4,924
Other investments (at cost)	(15)	5	5
		<b>28,390</b>	<b>32,338</b>
<b>Total</b>		<b>199,060</b>	<b>231,222</b>

### 11.2 Liabilities

	Note	2014/15	2013/14
<b>At fair value through profit or loss</b>			
Derivative financial instruments	—	47	0
		<b>47</b>	<b>0</b>
<b>Loans (financial liabilities recognized at (amortized) cost)</b>			
Corporate bond	(21)	74,485	74,301
Other financial liabilities	(21)	63,469	81,753
Trade payables	—	48,441	67,388
Other non-current liabilities	(24)	4,657	3,660
		<b>191,052</b>	<b>227,102</b>
<b>Total</b>		<b>191,099</b>	<b>227,102</b>

Financial instruments are recognized in the statement of comprehensive income with the following net results:

	2014/15	2013/14 (adjusted)
Available-for-sale financial assets	-18,442	103
Loans and receivables	6,700	-10,382
Financial liabilities recognized at (amortized) cost	-6,235	-6,318
At fair value through profit or loss	-47	0
	<b>-18,025</b>	<b>-16,598</b>

## 12 Property, plant and equipment.

	Land and buildings	Technical equipment and machinery	Construction in progress	Other equipment, factory and office equipment	Prepayments	Total
<b>Carrying amount as of 31 March 2013</b>	<b>3,821</b>	<b>9,419</b>	<b>2,091</b>	<b>9,344</b>	<b>0</b>	<b>24,676</b>
Currency translation differences	-35	-754	-154	-694	0	-1,637
Reclassification	0	1,000	-1,071	71	0	0
Additions from the acquisition						
of companies	16	1	0	93	0	110
Additions	984	3,821	1,410	4,285	71	10,572
Disposals	-3	-308	-869	-378	0	-1,558
Scheduled depreciation	-823	-4,030	0	-3,862	0	-8,715
<b>Carrying amount as of 31 March 2014</b>	<b>3,961</b>	<b>9,150</b>	<b>1,407</b>	<b>8,859</b>	<b>71</b>	<b>23,447</b>
Acquisition/production costs	8,831	47,411	1,407	25,297	71	83,017
Accumulated depreciation	-4,870	-38,262	0	-16,439	0	-59,570
<b>Carrying amount as of 31 March 2014</b>	<b>3,961</b>	<b>9,150</b>	<b>1,407</b>	<b>8,859</b>	<b>71</b>	<b>23,447</b>
<b>Carrying amount as of 31 March 2014</b>	<b>3,961</b>	<b>9,150</b>	<b>1,407</b>	<b>8,859</b>	<b>71</b>	<b>23,447</b>
Currency translation differences	102	520	316	332	0	1,270
Reclassification	1,106	0	-1,179	-820	0	-893
Additions	290	2,812	2,300	1,785	188	7,374
Disposals	0	-123	-749	-187	-71	-1,130
Scheduled depreciation	-886	-3,449	0	-3,341	0	-7,676
<b>Carrying amount as of 31 March 2015</b>	<b>4,572</b>	<b>8,909</b>	<b>2,096</b>	<b>6,628</b>	<b>188</b>	<b>22,393</b>
Acquisition/production costs	10,350	51,304	2,096	24,873	188	88,811
Accumulated depreciation	-5,778	-42,395	0	-18,245	0	-66,417
<b>Carrying amount as of 31 March 2015</b>	<b>4,572</b>	<b>8,909</b>	<b>2,096</b>	<b>6,628</b>	<b>188</b>	<b>22,393</b>

### 13 Intangible assets.

	Capitalized development costs	Concessions and rights	Goodwill	Intangible assets on completion	Prepayment	Total
<b>Carrying amount as of 31 March 2013</b>	<b>3</b>	<b>24,646</b>	<b>51,258</b>	<b>0</b>	<b>3,264</b>	<b>79,170</b>
Currency translation differences	0	-71	-863	-1	0	-934
Additions from the acquisition of companies	0	8,967	5,553	0	0	14,520
Additions	0	725	715	1,158	2,514	5,112
Disposals	0	0	0	-424	0	-424
Scheduled amortization	-3	-7,874	0	0	0	-7,876
<b>Carrying amount as of 31 March 2014</b>	<b>0</b>	<b>26,393</b>	<b>56,663</b>	<b>734</b>	<b>5,778</b>	<b>89,567</b>
Acquisition/production costs	8,586	61,775	56,663	734	5,778	133,536
Accumulated amortization	-8,586	-35,383	0	0	0	-43,969
<b>Carrying amount as of 31 March 2014</b>	<b>0</b>	<b>26,393</b>	<b>56,663</b>	<b>734</b>	<b>5,778</b>	<b>89,567</b>
<b>Carrying amount as of 31 March 2014</b>	<b>0</b>	<b>26,393</b>	<b>56,663</b>	<b>734</b>	<b>5,778</b>	<b>89,567</b>
Currency translation differences	0	48	1,007	0	0	1,054
Reclassification	0	893	0	0	0	893
Additions	0	446	0	329	219	994
Disposals	0	-1	0	-156	0	-157
Impairment	0	0	-12,342	0	0	-12,342
Scheduled amortization	0	-8,758	0	0	0	-8,758
<b>Carrying amount as of 31 March 2015</b>	<b>0</b>	<b>19,019</b>	<b>45,328</b>	<b>907</b>	<b>5,997</b>	<b>71,250</b>
Acquisition/production costs	8,302	62,310	45,328	907	5,997	122,844
Accumulated amortization	-8,302	-43,291	0	0	0	-51,593
<b>Carrying amount as of 31 March 2015</b>	<b>0</b>	<b>19,019</b>	<b>45,328</b>	<b>907</b>	<b>5,997</b>	<b>71,250</b>

The impairment result from the cash-generating unit „Road Solution Projects, Electronic Toll Collection“. The adverse market development of the preceding months required an adjustment of the multi-year planning and an impairment test as of 30 September 2014. Due to the result of the impairment test according to IAS 36 an impairment of the goodwill was recognized in the second quarter of the fiscal year 2014/15 amounting to TEUR 12,342 based on the value in use.

For the purpose of impairment testing, goodwill was allocated to 5 cash-generating units (CGU):

	2014/15	2013/14
CGU RSP-ETC: Road Solutions Projects, Electronic Toll Collection	27,080	38,416
CGU RSP-ITS: Solution Projects, Intelligent Transportation Systems	5,553	5,553
CGU SEC-ETC: Services, System Extensions, Components Sales, Electronic Toll Collection	11,961	11,961
CGU SEC-ITS: Services, System Extensions, Components Sales, Intelligent Transportation Systems	733	733
CGU OTH: Others	0	0
	<b>45,328</b>	<b>56,663</b>

The following key assumptions for all cash-generating units were made:

	2014/15	2013/14
Determination of recoverable amount	Value in use	Value in use
Detailed planning period	4 years	4 years
Discount rate after tax	8.28 %	9.24 %
Long-term growth rate	2.00 %	2.00 %

### 13.1 Cash-generating unit “Road Solution Projects, Electronic Toll Collection” (CGU RSP-ETC)

#### Key assumptions for determining expected cash flows of the CGU RSP-ETC

Management has based its determination on the assumption that after the successful implementation of road toll collection systems, in particular in Austria, the Czech Republic, Switzerland, Australia, South America, South Africa, Poland and the Republic of Belarus, demand for toll collection systems will remain stable, in particular as a result of tight public budgets. The planning for the CGU “Road Solution Projects, Electronic Toll Collection” is based on projects in the Republic of Belarus, America, Austria and Australia as well as the fact that tenders in several countries (for example in the Asian region) are already in the pipeline or in progress.

#### Parameter CGU RSP-ETC

	2014/15	2013/14
Carrying amount of goodwill allocated to the CGU	27,080	38,416
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	0
Value in use of the CGU	154,357	146,724
Carrying amount	127,045	146,468
Discount rate before tax	10.3 %	11.5 %
Break-Even discount rate	11.5 %	11.5 %

#### Sensitivity analyses with the impact of changes to the value in use of the CGU RSP-ETC

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	33,162	-25,268
Revenue growth	±10 %	-13,980	19,236
EBITDA margin	±10 %	-4,339	4,339
Long-term growth rate	±0.5 %	-14,456	16,959

### 13.2 Cash-generating unit “Road Solution Projects, Intelligent Transportation Systems” (CGU RSP-ITS)

#### Key assumptions for determining expected cash flows of the CGU RSP-ITS

Management has based its determination on the assumption that after the successful implementation of intelligent transportation systems, in particular in South Africa, in the Czech Republic and North America demand for intelligent transportation systems will continue to rise. The planning for the CGU “Road Solution Projects, Intelligent Transportation Systems” is based especially on road safety and traffic monitoring systems in North America, in Europe and in the Asian region.

#### Parameter CGU RSP-ITS

	2014/15	2013/14
Carrying amount of goodwill allocated to the CGU	5,553	5,553
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	0
Value in use of the CGU	15,855	283,738
Carrying amount	10,928	5,711
Discount rate before tax	9.8 %	11.3 %
Break-Even discount rate	12.4 %	213.0 %

#### Sensitivity analyses with the impact of changes to the value in use of the CGU RSP-ITS

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	3,005	-2,305
Revenue growth	±10 %	-547	1,391
EBITDA margin	±10 %	-497	497
Long-term growth rate	±0.5 %	-1,304	1,529

### 13.3 Cash-generating unit “Services, System Extensions, Components Sales, Electronic Toll Collection” (CGU SEC-ETC)

#### Key assumptions for determining expected cash flows of the CGU SEC-ETC

The Management has based its determination on the assumption that the group will remain the preferred supplier for operation, maintenance and supply of components for toll collection projects installed in previous years. The planning for the CGU “Services, System Extensions, Components Sales, Electronic Toll Collection” is based on ongoing maintenance for existing toll collection systems in Austria, Switzerland, the Czech Republic, Australia, South America, South Africa, Poland and the Republic of Belarus and on the commercial operation in the Czech Republic, South Africa, Poland and the Republic of Belarus. Furthermore expansions of completed nationwide electronic toll collection systems of Kapsch TrafficCom and long-term customer contracts for supply of components, especially to North America, Australia, Spain, Portugal, Denmark, France, Greece, Chile, Thailand, South Africa and Poland are included.

#### Parameter CGU SEC-ETC

	2014/15	2013/14
Carrying amount of goodwill allocated to the CGU	11,961	11,961
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	6,903	6,512
Value in use of the CGU	813,160	598,338
Carrying amount	109,969	131,063
Discount rate before tax	10.0 %	11.6 %
Break-Even discount rate	94.6 %	58.0 %

In the fiscal year 2014/15 intangible assets not yet ready for use in the amount of TEUR 6,903 (2013/14: TEUR 6,512) are allocated to the cash-generating unit “SEC-ETC”.

### Sensitivity analyses with the impact of changes to the value in use of the CGU SEC-ETC

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	113,254	-86,989
Revenue growth	±10 %	-9,843	9,878
EBITDA margin	±10 %	-14,749	14,749
Long-term growth rate	±0.5 %	-47,559	55,794

#### 13.4 Cash-generating unit “Services, System Extensions, Components Sales, Intelligent Transportation Systems” (CGU SEC-ITS)

##### Key assumptions for determining expected cash flows of the CGU SEC-ITS

The Management has based its determination on the assumption that Kapsch TrafficCom Group will perform also the technical maintenance and commercial operation after the implementation of nationwide Intelligent Transportation Systems. Expansions of these systems and the supply of specific components are included here. The planning for the CGU “Services, System Extensions, Components Sales, Intelligent Transportation Systems” is based especially on road safety and traffic monitoring systems in South Africa, the Czech Republic, and North America.

##### Parameter CGU SEC-ITS

	2014/15	2013/14
Carrying amount of goodwill allocated to the CGU	733	733
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	0
Value in use of the CGU	56,199	16,922
Carrying amount	4,163	2,239
Discount rate before tax	10.2 %	11.6 %
Break-Even discount rate	221.8 %	233.5 %

### Sensitivity analyses with the impact of changes to the value in use of the CGU SEC-ITS

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	8,399	-6,438
Revenue growth	±10 %	-823	1,509
EBITDA margin	±10 %	-1,070	1,070
Long-term growth rate	±0.5 %	-3,545	4,159

#### 13.5 Cash-generating unit “Others” (CGU OTH)

##### Key assumptions for determining expected cash flows of the CGU OTH

The Management assumes that the non-core business, operated by the the subsidiary Kapsch Components GmbH & Co KG and by KTC USA Inc. – will develop in a stable manner. The planning of the cash-generating unit “Others” is based on projects in Austria, such as the supply of components for the GSM-R technology for Kapsch CarrierCom, and on projects in North America.



#### Parameter CGU OTH

	2014/15	2013/14
Carrying amount of goodwill allocated to the CGU	0	0
Carrying amount of intangible assets with indefinite useful life allocated to the CGU (excl. goodwill)	0	0
Value in use of the CGU	11,015	9,876
Carrying amount	8,346	9,109
Discount rate before tax	10.4 %	11.0 %
Break-Even discount rate	16.1 %	11.7 %

#### Sensitivity analyses with the impact of changes to the value in use of the CGU OTH

	Changes in assumption	Decrease in assumption	Increase in assumption
Discount rate	±10 BP	940	-736
Revenue growth	±10 %	-467	467
EBITDA margin	±10 %	-232	232
Long-term growth rate	±0.5 %	-380	446

#### 13.6 Capitalized development costs

Development costs relate to expenses which in accordance with IAS 38 are capitalized and amortized over 3 to 5 years once the assets are available for commercial use.

Additional research and development costs of the group in the fiscal year 2014/15 amounted to EUR 49.0 million (2013/14: EUR 57.8 million). In the fiscal year 2014/15, EUR 22.0 million thereof (2013/14: EUR 26.3 million) related to project-specific development costs charged to the customer. The remaining amount of EUR 27.0 million (2013/14: EUR 31.5 million) was recognized as an expense.

#### 14 Interests in associates.

Interests in associates developed as follows:

	2014/15	2013/14
<b>Carrying amount as of 31 March of prior year</b>	<b>1,596</b>	<b>1,694</b>
Currency translation differences	184	-257
Addition from foundation and acquisition	0	0
Disposal	0	0
Share in result	234	158
<b>Carrying amount as of 31 March of fiscal year</b>	<b>2,014</b>	<b>1,596</b>

On 31 July 2012 the group acquired 33 % of the shares in SIMEX, Integración de Sistemas, S.A.P.I. de C.V., Mexico. Taking potential voting rights into account (options for purchase of the remaining shares) the group has the majority of the shares. As the potential voting rights are not assessed to be substantial the presumption of control was rebutted. As significant influence over the financial and business policies exists, the investment is accounted for using the equity method.

The financial data of the entity as of the latest balance sheet date (31 December) are as follows:

	31 Dec. 2014	31 Dec. 2013
Non-current assets	10,235	15,365
Current assets	1,340	1,012
Non-current liabilities	-620	-587
Current liabilities	-6,181	-11,581
<b>Net assets</b>	<b>4,774</b>	<b>4,209</b>
Revenue	14,816	15,574
Result for the period	527	484
Other comprehensive income for the period	0	0
<b>Total comprehensive income for the period</b>	<b>527</b>	<b>484</b>

## 15 Current and non-current financial assets.

	2014/15	2013/14
Other non-current financial assets and investments	23,099	28,506
Other current financial assets	5,291	4,924
	<b>28,390</b>	<b>33,430</b>

	Available- for-sale securities	Available- for-sale investments	Other non-current financial assets	Total
<b>Other non-current financial assets and investments</b>				
<b>Carrying amount as of 31 March 2013</b>	<b>3,684</b>	<b>32,008</b>	<b>2,394</b>	<b>38,085</b>
Currency translation differences	0	0	-138	-138
Additions	576	0	1,126	1,701
Disposals	-621	0	-2,289	-2,910
Change in fair value	16	-8,249	0	-8,233
<b>Carrying amount as of 31 March 2014</b>	<b>3,655</b>	<b>23,758</b>	<b>1,093</b>	<b>28,506</b>
Currency translation differences	0	0	98	98
Additions	0	362	0	362
Disposals	0	0	-1,190	-1,190
Change in fair value	148	-4,824	0	-4,676
<b>Carrying amount as of 31 March 2015</b>	<b>3,803</b>	<b>19,296</b>	<b>0</b>	<b>23,099</b>

	Available- for-sale securities	Other	Total
<b>Other current financial assets</b>			
<b>Carrying amount as of 31 March 2013</b>	<b>4,505</b>	<b>0</b>	<b>4,505</b>
Additions	0	0	0
Disposals	0	0	0
Change in fair value	419	0	419
<b>Carrying amount as of 31 March 2014</b>	<b>4,924</b>	<b>0</b>	<b>4,924</b>
Additions	0	0	0
Disposals	0	0	0
Change in fair value	367	0	367
<b>Carrying amount as of 31 March 2015</b>	<b>5,291</b>	<b>0</b>	<b>5,291</b>

As of 31 March 2015, available-for-sale securities relate to government and bank bonds as well as shares in investment funds. As of 31 March 2015, investments classified as available-for-sale mainly relate to a 19.48 % investment in the listed company Q-Free ASA, Trondheim, Norway.

Unrealized gains and losses are recognized in other comprehensive income of the period (see Note 10).

Other non-current financial assets relate to a loan from SIMEX, Integración de Sistemas, S.A.P.I. de C.V., Mexico to the group in the fiscal year 2013/14 that was repaid in the fiscal year 2014/15.

**Fair value-hierarchies and determination of fair value:**

Financial assets and liabilities have to be classified in one of the three following fair value-hierarchies:

**Level 1:** There are quoted prices in active markets for identical assets and liabilities. In the group, the investment in Q-Free ASA, Trondheim, Norway, as well as listed equity instruments are attributed to Level 1.

**Level 2:** The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques based on observable direct or indirect market data. This category comprises available-for-sale securities, such as mortgage bonds and government bonds, which are quoted, however not regularly traded on a stock market.

Specific valuation techniques used to value financial instruments include:

- ▶ quoted market prices or dealer quotes for similar instruments;
- ▶ the fair value of interest rate swaps is calculated as the present value of the estimated future cash flows based on observable yield curves;
- ▶ the fair value of forward foreign exchange contracts is determined using forward exchange rates at the balance sheet date, with the resulting value discounted back to present value;
- ▶ other techniques, such as discounted cash flow analysis, are used to determine fair value for the remaining financial instruments.

**Level 3:** Financial instruments are included in level 3 if the valuation information is not based on observable market data.

The classification of current and non-current financial assets is as follows:

	Level 1 Quoted prices	Level 2 Observable market data	Level 3 Not based on observable market data	2014/15
<b>Non-current financial assets</b>				
Available-for-sale securities	3,085	718	0	3,803
Available-for-sale investments	19,291	0	0	19,291
	<b>22,376</b>	<b>718</b>	<b>0</b>	<b>23,094</b>
<b>Current financial assets</b>				
Available-for-sale securities	5,291	0	0	5,291
	<b>5,291</b>	<b>0</b>	<b>0</b>	<b>5,291</b>
<b>Total</b>	<b>27,667</b>	<b>718</b>	<b>0</b>	<b>28,385</b>

In the fiscal year 2014/15, other investments amounting to TEUR 5 are recognized at amortized cost.

	Level 1	Level 2	Level 3	
	Quoted prices	Observable market data	Not based on observable market data	2013/14
<b>Non-current financial assets</b>				
Available-for-sale securities	2,906	749	0	3,655
Available-for-sale investments	23,753	0	0	23,753
	<b>26,659</b>	<b>749</b>	<b>0</b>	<b>27,409</b>
<b>Current financial assets</b>				
Available-for-sale securities	4,924	0	0	4,924
	<b>4,924</b>	<b>0</b>	<b>0</b>	<b>4,924</b>
<b>Total</b>	<b>31,583</b>	<b>749</b>	<b>0</b>	<b>32,333</b>

In the fiscal year 2013/14, other non-current financial assets amounting to TEUR 1,097 are recognized at amortized cost.

## 16 Other non-current assets.

	2014/15	2013/14
Project in the Republic of Belarus	26,987	68,937
Truck toll collection system Czech Republic	1,148	2,171
Other	3	5
	<b>28,138</b>	<b>71,113</b>

Other non-current assets include amounts due from customers for contract work for the installation of the truck toll collection system in the Republic of Belarus as well as trade receivables (non-current) that are due from the Czech Ministry of Transport for the installation of the Czech truck toll collection system. As in the prior year, they fall due between 1 and 5 years as of the balance sheet date.

Non-current receivables were discounted on the basis of cash flows using an interest rate of 2.71–5.65 % (for that part which was funded by external loans) and an interest rate for alternative investments of 2.89 % (for that part which was funded by internal cash flows of the group). Thus, the fair values approximate the carrying amounts.

Gross cash flows of other non-current assets are as follows:

	2014/15	2013/14
Up to 2 years	29,706	52,847
Between 2 and 3 years	171	23,259
More than 3 years	0	2,236
	<b>29,877</b>	<b>78,342</b>

Amounts due from customers for contract work (non-current) are as follows:

	2014/15	2013/14
Construction costs incurred plus recognized gains	26,987	68,937
Less total amounts invoiced and advance payments received	0	0
	<b>26,987</b>	<b>68,937</b>

## 17 Inventories.

	2014/15	2013/14
Purchased parts and merchandise, at acquisition cost	25,925	30,997
Unfinished goods and work in progress, at production cost	14,680	15,439
Finished goods, at production cost	7,033	11,550
Prepayments on inventories	33	122
	<b>47,670</b>	<b>58,108</b>

Individual inventory items were written down, where necessary, to their net realizable values. The write-downs of inventories amount to TEUR 21,171 (2013/14: TEUR 16,632). In the reporting period TEUR 4,539 were recognized in the statement of comprehensive income (2013/14: TEUR 2,584).

## 18 Trade receivables and other current assets.

	2014/15	2013/14
Trade receivables	75,470	138,305
Allowance for bad debts	-2,715	-421
Trade receivables – net	72,754	137,885
Amounts due from customers for contract work	83,995	23,165
Amounts due from customers for service and maintenance contracts	8,502	7,781
Receivables from tax authorities (other than income tax)	16,331	13,217
Other receivables and prepaid expenses	23,805	27,673
	<b>205,387</b>	<b>209,721</b>

Allowance for bad debt developed as follows:

	2014/15	2013/14
<b>Balance as of 31 March of the prior year</b>	<b>-421</b>	<b>-378</b>
Additions from the acquisition of companies	0	0
Addition	-2,422	-239
Utilization	73	106
Disposal	112	87
Currency translation differences	-58	4
<b>Balance as of 31 March of the reporting year</b>	<b>-2,715</b>	<b>-421</b>

Maturity structure of trade receivables and other current assets:

	2014/15	2013/14 (adjusted)
Not yet due	52,350	121,465
Overdue:		
Less than 60 days (not impaired)	11,143	6,923
More than 60 days (not impaired)	8,908	9,454
More than 60 days (impaired)	3,068	463
	<b>75,470</b>	<b>138,305</b>

Given the short maturities of these financial instruments, it is assumed that the fair values correspond to the carrying amounts. There is no concentration of credit risk with respect to trade receivables (except for the toll collection projects in the Czech Republic, South Africa, Poland and the Republic of Belarus), as the group generally has a large number of customers worldwide. Trade receivables (current) relating to the installation of the truck toll collection system of the Czech Republic amounting to TEUR 2,481 (2013/14: TEUR 2,169) and to the operation and maintenance of the system amounting to TEUR 22,044 (2013/14: TEUR 24,748) are due from Ředitelství silnic a dálnic ČR (RSD), a company of the Czech Republic. Trade receivables from the toll collection project in Poland due from GDDKiA (Generalna Dyrekcja Dróg Krajowych i Autostrad) amount to TEUR 5,027 (2013/14: TEUR 19,347). Trade receivables (current) relating to the installation of the truck toll collection system of the Republic of Belarus amounting to TEUR 0 (2013/14: TEUR 39,921) and to the operation of the system amounting to TEUR 875 (2013/14: TEUR 1,985) are due from BelToll.

Trade receivables amounting to TEUR 4,989 (2013/14: TEUR 4,472) were pledged as collateral to banks (see Note 21).

Amounts due from customers for contract work are as follows:

	2014/15	2013/14
Construction costs incurred plus recognized gains	439,282	324,075
Less amounts billed and prepayments received	-355,287	-300,910
	<b>83,995</b>	<b>23,165</b>

As of 31 March 2015, amounts due from customers for contract work primarily relate to toll collection projects in North America amounting to TEUR 21,400 (2013/14: TEUR 8,189), in France amounting to TEUR 2,083 (2013/14: TEUR 8,996) as well as the establishment of the toll collection system in the Republic of Belarus amounting to TEUR 53,499 (2013/14: TEUR 0).

Revenues from construction contracts amount to TEUR 105,879 (2013/14: TEUR 136,949).

## 19 Cash and cash equivalents.

	2014/15	2013/14
Cash on hand	62	34
Deposits held with banks	96,703	57,697
	<b>96,765</b>	<b>57,731</b>

The carrying amounts of this item also represent cash and cash equivalents at the end of the reporting period as presented in the cash flow statement.

## 20 Share capital.

	2014/15	2013/14
<b>Carrying amount as of 31 March of fiscal year</b>	<b>13.000</b>	<b>13.000</b>

The total number of shares issued is 13,000,000. The shares are ordinary bearer shares and have no par value.

## 21 Current and non-current financial liabilities.

	2014/15	2013/14
<b>Current</b>		
Loans for project financing	20,333	20,333
Other current loans	28,636	26,226
	<b>48,969</b>	<b>46,560</b>
<b>Non-current</b>		
Corporate bond	74,485	74,301
Loans for project financing	14,500	34,833
Other non-current loans	0	360
	<b>88,985</b>	<b>109,494</b>
<b>Total</b>	<b>137,954</b>	<b>156,054</b>

The corporate bond of Kapsch TrafficCom AG was successfully placed in November 2010 with a volume of EUR 75 million, a maturity of 7 years and an interest rate of 4.25%. The effective interest rate amounts to 4.54%.

Respective to the premature buyback offer of the corporate bond in the amount of EUR 4,182,000 of May 2015, we refer to Note 32, events after the balance sheet date.

All other non-current liabilities mature in 1 to 5 years.

The fair values and the gross cash flows of current and non-current financial liabilities are as follows:

	2014/15	2013/14
<b>Carrying amount</b>	<b>137,954</b>	<b>156,054</b>
<b>Fair value</b>	<b>151,226</b>	<b>159,981</b>
Gross cash flows:		
Up to 1 year	52,735	50,964
Between 1 and 3 years	96,455	42,840
Between 3 and 5 years	0	75,988
	<b>149,191</b>	<b>169,792</b>

The classification of financial liabilities according to is as follows:

	Level 1 Quoted prices	Level 2 Observable market data	Level 3 Not based on observable market data	2014/15
Corporate bond	78,338	0	0	78,338
Other financial liabilities	0	72,888	0	72,888
<b>Total</b>	<b>78,338</b>	<b>72,888</b>	<b>0</b>	<b>151,226</b>

	Level 1 Quoted prices	Level 2 Observable market data	Level 3 Not based on observable market data	2014/15
Corporate bond	78,863	0	0	78,863
Other financial liabilities	0	81,118	0	81,118
<b>Total</b>	<b>78,863</b>	<b>81,118</b>	<b>0</b>	<b>159,981</b>

The fair value of the other financial liabilities (level 2) was derived through discounting the gross cash flows over the contracted term at a risk-adjusted interest rate.

Interest rates on current and non-current financial liabilities are as follows:

	2014/15	2013/14
Total financial liabilities:		
Carrying fixed interest rates	78,537	78,910
Carrying variable interest rates	59,416	77,144
	<b>137,954</b>	<b>156,054</b>
Average interest rates:		
Current loans	1.00–3.10 %	0.97–3.31 %
Loans for project financing	5.46 %	5.46 %
Corporate bond	4.54 %	4.54 %
Other	–	2.90 %

Trade receivables (current) amounting to TEUR 4,989 (2013/14: TEUR 4,472) were pledged as collateral for bank guarantees and loans.



For project financing of the Belorussian toll collection system, with an outstanding amount of TEUR 34,833 as of 31 March 2015 (2013/14: TEUR 55,167), Kapsch TrafficCom AG obtained a guarantee of a bill of exchange of the Oesterreichische Kontrollbank Aktiengesellschaft (OeKB) as well as a participation guarantee G4 of OeKB. The claims of the participation guarantee G4 have been assigned as security to the lending banks.

A bill of exchange amounting to TEUR 1,425 (2013/14: TEUR 1,425) was issued for an export promotion credit.

## 22 Deferred tax assets/liabilities.

	2014/15	2013/14
<b>Deferred tax assets</b>		
Deferred tax assets to be recovered after more than 12 months	9,274	12,933
Deferred tax assets to be recovered within 12 months	4,317	9,176
	<b>13,590</b>	<b>22,110</b>
<b>Deferred tax liabilities</b>		
Deferred tax liabilities to be recovered after more than 12 months	1,052	5,699
Deferred tax liabilities to be recovered within 12 months	1,328	5,079
	<b>2,380</b>	<b>10,778</b>
<b>Deferred tax assets net (+) / deferred tax liabilities net (-)</b>	<b>11,210</b>	<b>11,332</b>

Deferred taxes due to tax loss carry-forwards and other temporary differences deductible in the future are recognized only to the extent of their potential realization. In these consolidated financial statements, tax loss carry-forwards amounting to TEUR 28,996 (2013/14: TEUR 26,702) have not been recognized because it was uncertain whether there would be sufficient taxable profits available against which to offset them. These tax loss carry-forwards origin from foreign subsidiaries with the predominant part not expiring before 2030. All other deferred tax assets have been recognized in the respective group companies as future deductible items.

Deferred income tax assets and liabilities are offset, taking maturities into account, when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income taxes assets and liabilities relate to income taxes levied by the same taxation authority on the same taxable entity.

Deferred tax assets/liabilities are attributable to the following positions:

	31 March 2013	Additions from the acquisition of companies	Taken through the profit of the period	Taken through equity	Currency translation differences	31 March 2014
<b>Deferred tax assets</b>						
Tax loss carry-forwards	5,675	0	2,586	0	-639	7,623
Provisions disallowed for tax purposes	9,065	0	-2,090	37	-36	6,976
Depreciation disallowed for tax purposes	1,512	0	-333	0	-16	1,163
Construction contracts	0	0	804	0	0	804
Other	8,800	0	-3,487	52	-262	5,103
	<b>25,052</b>	<b>0</b>	<b>-2,520</b>	<b>89</b>	<b>-953</b>	<b>21,669</b>
<b>Deferred tax liabilities</b>						
Special depreciation/amortization of non-current assets	456	0	209	0	-93	572
Construction contracts	6,955	0	-6,955	0	0	0
Gains from recognition at fair value	6,473	3,497	-2,152	0	0	7,818
Other	3,393	0	-1,412	0	-35	1,946
	<b>17,277</b>	<b>3,497</b>	<b>-10,309</b>	<b>0</b>	<b>-128</b>	<b>10,337</b>
<b>Total change</b>	<b>7,776</b>	<b>-3,497</b>	<b>7,789</b>	<b>89</b>	<b>-825</b>	<b>11,332</b>

	31 March 2014	Additions from the acquisition of companies	Taken through the profit of the period	Taken through equity	Currency translation differences	31 March 2015
<b>Deferred tax assets</b>						
Tax loss carry-forwards	7,623	0	204	0	184	8,011
Provisions disallowed for tax purposes	6,976	0	-2,907	646	38	4,753
Depreciation disallowed for tax purposes	1,163	0	-123	0	10	1,049
Construction contracts	804	0	1,211	0	0	2,014
Other	5,103	0	1,538	-2,298	113	4,456
	<b>21,669</b>	<b>0</b>	<b>-77</b>	<b>-1,653</b>	<b>345</b>	<b>20,283</b>
<b>Deferred tax liabilities</b>						
Special depreciation/amortization of non-current assets	572	0	213	0	72	857
Gains from recognition at fair value	7,818	0	-2,508	0	0	5,310
Other	1,946	0	833	92	34	2,905
	<b>10,337</b>	<b>0</b>	<b>-1,462</b>	<b>92</b>	<b>106</b>	<b>9,073</b>
<b>Total change</b>	<b>11,332</b>	<b>0</b>	<b>1,385</b>	<b>-1,744</b>	<b>238</b>	<b>11,210</b>

## 23 Liabilities from post-employment benefits to employees.

Amounts recognized in the balance sheet:

	2014/15	2013/14
Termination benefits	9,690	8,790
Pension benefits	15,520	13,363
	<b>25,210</b>	<b>22,153</b>

### Termination benefits

Termination benefits include legal and contractual entitlements to one-off payments to employees of the group which result from events such as dismissal by the employer, amicable termination of the employment, retirement or death of the employee. For termination benefits the group bears the risk of inflation due to compensation increases. The obligations from termination benefits mainly result from the Austrian entities of the group.

### Retirement benefits

Liabilities for retirement benefits recognized at the balance sheet date relate to retirees only. All pension agreements are based on the final salary, are granted as fixed monthly pension payments and are not covered by external plan assets (funds). In addition, contributions are paid to an external pension fund for employees of the group (see Note 5). For retirement benefits the group bears the risk of longevity and inflation due to pension increases.

Termination benefits obligations were valued based on an interest rate of 2.10 % (2013/14: 3.60 %), pension benefit obligations were valued based on an interest rate of 1.80 % (2013/14: 3.20 %) for the euro area and based on an interest rate of 3.75 % (2013/14: 4.35 %) for Canada and compensation increases based on a rate of 2.0 % (2013/14: 2.0 %). In addition, the calculation was based on the earliest possible statutory retirement age including transition provisions and using the mortality tables AVÖ 2008-P (2013/14: AVÖ 2008-P) by Pagler & Pagler. Pension increases were estimated at 1.7 % (2013/14: 1.7 %).

The following amounts are recognized in the statement of comprehensive income as **expenses for termination benefits**:

	2014/15	2013/14
<b>Change in liabilities recognized in the balance sheet:</b>		
<b>Carrying amount as of 31 March of prior year</b>	<b>8,790</b>	<b>9,064</b>
Remeasurements (actuarial gains/losses)	836	37
Current service cost	281	230
Interest expense	306	403
Payments	-543	-944
Currency translation differences	19	0
<b>Carrying amount as of 31 March of fiscal year</b>	<b>9,690</b>	<b>8,790</b>
Total, included in the staff costs (Note 5)	281	230
Total, included in the financial result (Note 8)	306	403

Remeasurements are attributable to the following positions:

	2014/15	2013/14
Remeasurements from changes in demographic assumptions	-158	0
Remeasurements from changes in financial assumptions	1,046	91
Remeasurements from other changes (experience adjustments)	-53	-54
<b>Total</b>	<b>836</b>	<b>37</b>

In the following sensitivity analysis for termination benefit obligations, the impacts resulting from changes in significant actuarial assumptions were changed, whereas the other impact quantities were kept constant. However in reality it will be rather likely that several of these impact quantities will change.

	Changes in assumption	Decrease in assumption	Increase in assumption
<b>Impact of changes in the discount rate</b>			
Defined benefit obligation (DBO)	± 0.5 BP	399	-373
Expected annual interest expenses (IC)	± 0.5 BP	-40	37
Expected annual service costs (CSC)	± 0.5 BP	12	-11
<b>Impact of changes in salary increases</b>			
Defined benefit obligation (DBO)	± 0.5 BP	-354	374
Expected annual interest expenses (IC)	± 0.5 BP	-7	8
Expected annual service costs (CSC)	± 0.5 BP	-11	12
<b>Impact of changes in fluctuation</b>			
Defined benefit obligation (DBO)	± 5 %	18	-17
Expected annual interest expenses (IC)	± 5 %	0	0
Expected annual service costs (CSC)	± 5 %	1	-1

The following amounts are recognized in the statement of comprehensive income as **expenses for retirement benefits**:

	2014/15	2013/14
<b>Change in liabilities recognized in the balance sheet:</b>		
<b>Carrying amount as of 31 March of prior year</b>	<b>13,363</b>	<b>13,537</b>
Remeasurements (actuarial gains/losses)	2,328	428
Current service cost	11	14
Interest expense	452	498
Payments	-862	-850
Currency translation differences	230	-265
<b>Carrying amount as of 31 March of fiscal year</b>	<b>15,520</b>	<b>13,363</b>
Total, included in the staff costs (Note 5)	11	14
Total, included in the financial result (Note 8)	452	498

Remeasurements are attributable to the following positions:

	2014/15	2013/14
Remeasurements from changes in demographic assumptions	0	-18
Remeasurements from changes in financial assumptions	1,984	365
Remeasurements from other changes (experience adjustments)	344	81
<b>Total</b>	<b>2,328</b>	<b>428</b>

In the following sensitivity analysis for pension obligations, the impacts resulting from changes in significant actuarial assumptions were changed, whereas the other impact quantities were kept constant. However in reality it will be rather likely that several of these impact quantities will change.

	Changes in assumption	Decrease in assumption	Increase in assumption
<b>Impact of changes in the discount rate</b>			
Defined benefit obligation (DBO)	± 0.5 BP	700	-644
Expected annual interest expenses (IC)	± 0.5 BP	-55	50
<b>Impact of changes in pension increases</b>			
Defined benefit obligation (DBO)	± 0.5 BP	-645	693
Expected annual interest expenses (IC)	± 0.5 BP	-12	12

## 24 Other non-current liabilities.

	2014/15	2013/14
Truck toll collection system Czech Republic	568	1,207
Other	4,089	2,453
	<b>4,657</b>	<b>3,660</b>

Other non-current liabilities relate to trade payables (non-current) amounting to TEUR 568 (2013/14: TEUR 1,207) due to subcontractors for the installation of the Czech truck toll collection system. As in the prior year, these liabilities are due in more than 1 year and less than 5 years as of the balance sheet date. These non-current liabilities were discounted on the basis of cash flows using discount rates that correspond to those rates applied in discounting non-current receivables from the Czech truck toll collection system (see Note 16). Thus, the fair values approximate the carrying amounts.

Other non-current liabilities mainly relate to loans from minority shareholders of TMT Services and Supplies (Pty) Ltd., Capetown, South Africa amounting to TEUR 1,483 (2013/14: TEUR 1,481), to the non-current portion of a contingent payment obligation amounting to TEUR 288 (2013/14: TEUR 409) from the acquisition of the "Mobility Solutions" business of TechnoCom Corporation, Encino, U.S.A., as well as to the variable purchase price component (earn-out payment) from the acquisition of shares in Kapsch Telematic Services GmbH, Vienna, amounting to TEUR 2,036 (2013/14: TEUR 0), see note 30.

The gross cash flows of other non-current liabilities are as follows:

	2014/15	2013/14
Less than 2 year	1,080	1,078
Between 2 and 3 years	2,181	1,934
More than 3 years	1,704	970
	<b>4,966</b>	<b>3,982</b>

## 25 Other liabilities and deferred income.

	2014/15	2013/14
Amounts due to customers for contract work	17,786	14,756
Prepayments received	349	248
Current portion of other non-current liabilities	162	0
Current liabilities from derivatives and hedging activities	47	0
Non-current employee liabilities	18,984	18,503
Liabilities to tax authorities (other than income tax)	5,241	9,910
Liabilities from tax compensation to the tax group leader	4,298	5,058
Other liabilities and deferred income	18,668	14,335
	<b>65,535</b>	<b>62,810</b>

Amounts due to customers for contract work detail as follows:

	2014/15	2013/14
Construction costs incurred plus recognized gains	-76,019	-62,777
Less amounts billed and prepayments received	93,805	77,533
	<b>17,786</b>	<b>14,756</b>

As of 31 March 2015, amounts due to customers for contract work mainly relate to toll collection projects in North America (2013/14: toll collection project in North America).

## 26 Provisions.

	2014/15	2013/14
Non-current provisions	1,661	1,303
Current provisions	9,225	28,378
	<b>10,886</b>	<b>29,680</b>

The provisions changed as follows:

	31 March 2013	Additions from the acquisition of companies	Addition	Utilization	Disposal	Reclassi- fication	Currency translation differences	31 March 2014
Obligations from								
anniversary bonuses	1,182	0	162	-11	-213	0	0	1,120
Other	188	0	249	0	0	-173	-81	183
<b>Non-current provisions, total</b>	<b>1,370</b>	<b>0</b>	<b>411</b>	<b>-11</b>	<b>-213</b>	<b>-173</b>	<b>-81</b>	<b>1,303</b>
Warranties	1,910	134	327	-573	-225	173	-109	1,637
Losses from pending								
transactions and rework	18,514	0	0	-2,326	0	0	13	16,201
Legal fees, costs of litigation								
and contract risks	2,524	0	2,149	-506	-110	5	10	4,071
Other	5,286	0	13,468	-12,040	-33	-5	-209	6,468
<b>Current provisions, total</b>	<b>28,233</b>	<b>134</b>	<b>15,944</b>	<b>-15,444</b>	<b>-368</b>	<b>173</b>	<b>-295</b>	<b>28,378</b>
<b>Total</b>	<b>29,603</b>	<b>134</b>	<b>16,354</b>	<b>-15,455</b>	<b>-581</b>	<b>0</b>	<b>-376</b>	<b>29,680</b>
	31 March 2014	Additions from the acquisition of companies	Addition	Utilization	Disposal	Reclassi- fication	Currency translation differences	31 March 2015
Obligations from								
anniversary bonuses	1,120	0	72	0	-2	0	0	1,189
Other	183	0	277	-52	0	0	64	472
<b>Non-current provisions, total</b>	<b>1,303</b>	<b>0</b>	<b>349</b>	<b>-52</b>	<b>-2</b>	<b>0</b>	<b>64</b>	<b>1,661</b>
Warranties	1,637	0	209	-18	-245	0	28	1,611
Losses from pending								
transactions and rework	16,201	0	0	-3	-16,162	0	-36	1
Legal fees, costs of litigation								
and contract risks	4,071	0	220	-2,682	-1,198	0	-9	402
Other	6,468	0	5,148	-4,337	-396	0	328	7,211
<b>Current provisions, total</b>	<b>28,378</b>	<b>0</b>	<b>5,577</b>	<b>-7,039</b>	<b>-18,001</b>	<b>0</b>	<b>311</b>	<b>9,225</b>
<b>Total</b>	<b>29,680</b>	<b>0</b>	<b>5,926</b>	<b>-7,091</b>	<b>-18,004</b>	<b>0</b>	<b>375</b>	<b>10,886</b>

The provision for anniversary bonuses relates to non-current entitlements of employees based on Collective Agreements. The valuation was based on an interest rate of 2.10 % (2013/14: 3.60 %), the earliest possible statutory retirement age including transition provisions and using the mortality tables AVÖ 2008-P (2013/14: AVÖ 2008-P) by Pagler & Pagler, increases in salary were considered at 2.0 % (2013/14: 2.0 %). In the position "Addition" interest effects amounting to TEUR 38 (2013/14: TEUR 42) are included.

As manufacturer, dealer and service provider, the group issues product warranties at the time of sale to its customers. Usually, under the terms of the warranty contract, the group has the obligation to repair or replace manufacturing or software defects that become apparent within the period under guarantee.

When the group expects warranty claims on products sold or services rendered during the period under guarantee, a corresponding provision is set up in the financial statements. Based on the expectation that the majority of the expenditure will be incurred in the short or medium term, the best estimate for the cost of warranty is used for the recognition of the provision. Likewise, historical data is taken into account in the calculation of the provision amount. According to past experience, it is probable that there will be claims under the warranties.

The provision for losses from pending transactions and rework was set up for expected losses from not yet completed construction contracts at the balance sheet date. Due to a change in circumstances as of 30 September 2014 a provision for losses from pending transactions and rework in the amount of TEUR 16,162 had to be reversed in the second quarter of fiscal year 2014/15. The management considers the risk of incurring the pending loss as remote.

Other provisions mainly include provisions for commissions and bonuses, rebate in kind, outstanding credit notes and project costs, discounts granted to customers and legal and consulting fees.

## 27 Contingent liabilities, other commitments and operating lease commitments.

The group's contingent liabilities primarily result from large-scale projects. Other commitments mainly relate to contract and warranty bonds, bank guarantees, performance and bid bonds as well as sureties.

Details of contingent liabilities and other commitments are as follows:

	2014/15	2013/14
<b>Contract, warranty, performance and bid bonds</b>		
Toll collection system South Africa, Gauteng	87,578	79,161
Toll collection system North America	79,441	62,284
City Highway Sydney and Melbourne	20,593	6,439
Truck toll collection system Austria	8,500	8,500
Toll collection system Poland	7,236	7,115
Truck toll collection system Czech Republic	4,126	1,448
Toll collection system Portugal	167	573
Other	1,647	2,009
	<b>209,288</b>	<b>167,530</b>
<b>Bank guarantees</b>	<b>1,664</b>	<b>1,774</b>
<b>Sureties</b>	<b>61</b>	<b>62</b>
	<b>211,014</b>	<b>169,365</b>

For details of securities for above-mentioned contingent liabilities and other commitments, see Note 15 and Note 21. Furthermore, assets of Kapsch TrafficCom AB, Jönköping, Sweden, amounting to TEUR 9,688 (2013/14: TEUR 10,146) were pledged in favor of a Swedish bank in order to secure contingent liabilities.



### Financial obligations from lease contracts:

The future payments from non-cancelable obligations from rental and operating lease contracts are presented below:

	2014/15	2013/14
Up to 1 year	13,519	13,216
Between 1 and 5 years	31,656	27,565
Over 5 years	15,894	18,063
	<b>61,069</b>	<b>58,844</b>

### Rental and lease payments recognized as expenses in the reporting period:

Payments from operating leases recognized as expenses of the reporting period are as follows:

	2014/15	2013/14
Rent	10,833	10,162
Motor vehicle leases	1,621	1,620
IT leases	3,494	3,161
Other	532	856
	<b>16,481</b>	<b>15,798</b>

## 28 Interests in subsidiaries.

Entity, Headquarter of Entity	Internal designation	31 March 2015		31 March 2014	
		Group's share	Non-controlling interests	Group's share	Non-controlling interests
Kapsch TrafficCom, Vienna	KTC	100.00%	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Construction & Realization spol. s r.o., Prague, Czech Republic	KTC C&R CZ	99.0%	1.0 %	99.0 %	1.0 %
Kapsch TrafficCom Ltd., Manchester, United Kingdom	KTC UK	100.0%	0.0%	100.0 %	0.0 %
Kapsch Components GmbH & Co KG, Vienna	KCO	100.0%	0.0%	100.0 %	0.0 %
Kapsch Components GmbH, Vienna	KCO GmbH	100.0%	0.0%	100.0 %	0.0 %
ArtiBrain Software Entwicklungsgesellschaft mbH, Vienna	ArtiBrain	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom S.r.l. a socio unico, Milan, Italy	KTC Italy	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom d.o.o., Ljubljana, Slovenia	KTC Slovenia	100.0%	0.0%	100.0 %	0.0 %
Transport Telematic Systems – LLC, Abu Dhabi, United Arab Emirates ****)	TTS, UAE	49.0%	51.0 %	49.0 %	51.0 %
OOO Kapsch TrafficCom Russia, Moscow, Russia	KTC Russia	100.0%	0.0%	100.0 %	0.0 %
Kapsch Telematik Technologies Bulgaria EAD, Sofia, Bulgaria	KTTB, Bulgaria	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom Argentina S.A., Buenos Aires, Argentina	KTC Argentina	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom Kazakhstan LLC, Almaty, Kazakhstan	KTC Kazakhstan	100.0%	0.0%	100.0 %	0.0 %
Kapsch Telematic Services IOOO, Minsk, Republic of Belarus	KTS Belarus	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom KGZ, Bischkek, Kyrgyzstan *)	KTC Kyrgyzstan	100.0%	0.0%	—	—
Kapsch TrafficCom Lietuva, Vilnius, Lithuania *)	KTC Lithuania	51.0%	49.0%	—	—
KTS Beteiligungs GmbH, Vienna (former: Jibesoev GmbH)	Jibesoev, Austria	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom AB, Jönköping, Sweden	KTC Sweden	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom do Brasil, Sao Paulo, Brazil	KTC Brazil	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom Australia Pty Ltd, Melbourne, Australia	KTC Australia	100.0%	0.0%	100.0 %	0.0 %
Kapsch TrafficCom Chile S.A., Santiago de Chile, Chile	KTC Chile	100.0%	0.0%	100.0 %	0.0 %

Entity, Headquarter of Entity	Internal designation	31 March 2015		31 March 2014	
		Group's share	Non-controlling interests	Group's share	Non-controlling interests
Kapsch TrafficCom France SAS, Paris, France	KTC France	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom PTE.LTD., Tripleone Somerset, Singapore	KTC Singapore	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom (M) Sdn Bhd, Kuala Lumpur, Malaysia	KTC Malaysia	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Limited, Auckland, New Zealand	KTC New Zealand	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom South Africa (Pty) Ltd., Johannesburg, South Africa	KTC SA	100.0 %	0.0 %	100.0 %	0.0 %
Electronic Toll Collection (PTY) Ltd., Centurion, South Africa	ETC	87.0 %	13.0 %	87.0 %	13.0 %
Kapsch TrafficCom South Africa Holding (Pty) Ltd., Cape Town, South Africa	KTC SA Holding	100.0 %	0.0 %	100.0 %	0.0 %
TMT Services and Supplies (Pty) Ltd., Cape Town, South Africa	TMT	62.9 %	37.1 %	62.9 %	37.1 %
Mobiserve Pty. Ltd. (former TMT Services and Supplies (Gauteng) (Pty) Ltd.), Cape Town, South Africa	Mobiserve	62.9 %	37.1 %	62.9 %	37.1 %
Berrydust 51 (Pty) Ltd., Cape Town, South Africa	Berrydust	53.5 %	46.5 %	53.5 %	46.5 %
Kapsch TrafficCom B.V., Amsterdam, Netherlands	KTC BV	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Canada Inc., Mississauga, Canada	KTC Canada	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom IVHS, S.A. de C.V., Mexico City, Mexico	KTC IVHS Mexico	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Holding II US Corp., McLean, USA	KTC Hold. II US Corp.	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom IVHS Technologies Holding Corp., McLean, USA ***)	KTC IVHS Tech. Hold. Corp.	—	—	100.0 %	0.0 %
Kapsch TrafficCom IVHS Holding Corp., McLean, USA ***)	KTC IVHS Hold. Corp.	—	—	100.0 %	0.0 %
Kapsch TrafficCom IVHS Inc., McLean, USA	KTC IVHS Inc., USA	100.0 %	0.0 %	100.0 %	0.0 %
KTC USA Inc., Duluth, USA (former: Transdyn Inc.)	KTC USA, Inc.	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom Holding Corp., McLean, USA ***)	KTC Holding Corp., USA	100.0 %	0.0 %	100.0 %	0.0 %
Kapsch TrafficCom U.S. Corp., McLean, USA	KTC US Corp., USA	—	—	100.0 %	0.0 %
Kapsch TrafficCom Inc., Carlsbad, USA	KTC Inc., USA	100.0 %	0.0 %	100.0 %	0.0 %
KTCSL Merger Corp., Delaware, USA *)	KTCSL	100.0 %	0.0 %	—	—
Kapsch Telematic Services GmbH, Vienna	KTS Austria	100.0 %	0.0 %	97.0 %	3.0 %
Kapsch Telematic Services Kft., Budapest, Hungary	KTS Hungary	100.0 %	0.0 %	97.0 %	3.0 %
Kapsch Telematic Services spol. s r.o., Prague, Czech Republic	KTS CZ	52.0 %	48.0 %	50.4 %	49.6 %
Kapsch Telematic Services GmbH Deutschland, Berlin, Germany	KTS Germany	100.0 %	0.0 %	97.0 %	3.0 %
Kapsch Telematic Services Solutions A/S, Copenhagen, Denmark	KTSS Denmark	60.0 %	40.0 %	58.2 %	41.8 %
Kapsch Telematic Services sp. z o.o., Warsaw, Poland	KTS Poland	100.0 %	0.0 %	97.0 %	3.0 %
Kapsch Road Services sp. z o.o., Warsaw, Poland	KRS Poland	100.0 %	0.0 %	97.0 %	3.0 %
VTI Industrial Electronics (Proprietary Limited ZA) (South Africa), Germiston, South Africa **)	VTI	—	—	100.0 %	0.0 %

\*) Foundation in fiscal year 2014/15

\*\*) Deconsolidation in fiscal year 2014/15

\*\*\*) Merger in fiscal year 2014/15

\*\*\*\*) Power over the relevant activities of the entity based on substantive rights

For ease of presentation, the internal designations of the entities are stated in the following tables and explanations.

For all entities mentioned above the headquarter of the company complies with the country of incorporation

With exception of the following entities all mentioned subsidiaries report at balance sheet date as of 31 March:

- ▶ Kapsch TrafficCom Russia OOO, Minsk, Republic of Belarus (Balance sheet date of 31 December)  
Due to legal restrictions the company reports as of 31 December.
- ▶ Kapsch Telematik Technologies Bulgaria EAD, Sofia, Bulgaria (31 December)  
Due to legal restrictions the company reports as of 31 December.
- ▶ Kapsch TrafficCom Kazakhstan LLC, Almaty, Kazakhstan (31 December)  
Due to legal restrictions the company reports as of 31 December.
- ▶ Kapsch Telematic Services IOOO, Minsk, Republic of Belarus (31 December)  
Due to legal restrictions the company reports as of 31 December.
- ▶ KTS Beteiligungs GmbH (formerly Jibesoev GmbH), Vienna (31 December)  
The entity was acquired, the balance sheet date as of 31 December has not been adopted.
- ▶ Kapsch TrafficCom KGZ, Bischkek, Kyrgyzstan (31. December)  
Due to legal restrictions the company reports as of 31 December.
- ▶ Kapsch TrafficCom Lietuva, Vilnius, Lithuania (31 December)  
The entity was incorporated together with a partner and reports as of 31 December.

## 29 Non-controlling interests.

The non-controlling interests represent the third party shares in the equity of consolidated subsidiaries.

### Information on the balance sheet

The balance sheet of the consolidated subsidiaries with material non-controlling interests and the carrying amount of material non-controlling interests are represented below:

Amounts before intercompany eliminations						Carrying amount of non-controlling interests
Information on the balance sheet as of 31 March 2015	Non-current assets	Current assets	Non-current liabilities	Current liabilities	Net	
KTS CZ	1,446	34,115	0	17,147	18,414	8,579
KTS Poland	3,582	34,890	1,198	20,699	16,575	0
TMT	8,576	7,259	1,483	3,454	10,899	4,374
ETC	3,552	34,412	33,334	17,363	-12,733	-1,044
KTS Austria	4,486	6,399	0	23	10,862	0
Remaining						-506
<b>Carrying amount as of 31.03.2015</b>						<b>11,403</b>

Amounts before intercompany eliminations						Carrying amount of non-controlling interests
Information on the balance sheet as of 31 March 2014	Non-current assets	Current assets	Non-current liabilities	Current liabilities	Net	
KTS CZ	1,634	35,590	0	19,349	17,874	8,481
KTS Poland	7,626	40,832	1,705	43,264	3,489	52
ETC	3,769	31,511	31,185	16,811	-12,717	-942
TMT	8,017	8,196	1,481	5,047	9,684	3,924
KTS Austria	4,986	1,710	0	1	6,695	-433
Remaining						-771
<b>Carrying amount as of 31.03.2014</b>						<b>10,310</b>

### Information on the statement of comprehensive income

The statement of comprehensive income of the consolidated subsidiaries with material non-controlling interests are represented below:

Information on the statement of comprehensive income 2014/15	Amounts before intercompany eliminations			Amounts after consolidations			
	Revenues	Result for the period	Other comprehensive income	Total comprehensive income	Result for the period	Other comprehensive income	Total comprehensive income
KTS CZ	75,572	14,595	-37	14,558	7,111	-18	7,093
KTS Poland	66,294	16,062	-3	16,060	535	-2	533
TMT	19,343	164	1,051	1,215	61	390	450
ETC	53,567	1,311	-1,327	-16	71	-172	-102
KTS Austria	0	10,668	0	10,668	-7	0	-7
Remaining					7	1	8
<b>Total</b>					<b>7,778</b>	<b>198</b>	<b>7,976</b>

Information on the statement of comprehensive income 2013/14	Amounts before intercompany eliminations			Amounts after consolidations			
	Revenues	Result for the period	Other comprehensive income	Total comprehensive income	Result for the period	Other comprehensive income	Total comprehensive income
KTS CZ	79,511	14,463	-807	13,656	7,168	-400	6,768
KTS Poland	69,888	4,835	49	4,884	145	1	147
TMT	20,736	-1	-2,233	-2,235	-1	-828	-829
ETC	21,211	-18,345	324	-18,021	-141	42	-99
KTS Austria	2,557	6,342	-47	6,295	8	0	8
Remaining					-24	7	-17
<b>Total</b>					<b>7,156</b>	<b>-1,178</b>	<b>5,978</b>

### Information on the cashflow statement and dividends

The cashflow statement and dividends of the consolidated subsidiaries with material non-controlling interests are represented below:

Information on the cashflow statement 2014/15	Cashflow from			Cash Net-Increase/decrease	Dividends paid to non-controlling shareholders
	Operations	Investing activities	Financing activities		
KTS CZ	15,062	-433	-14,012	616	-6,726
KTS Poland	15,965	-398	-3,505	12,063	0
ETC	2,000	0	2,148	4,148	0
TMT	-166	-294	-829	-1,288	0
KTS Austria	12,301	38	-6,099	6,240	-195
KTS Belarus	11,901	-720	-20,464	-9,283	0
Remaining					-9
<b>2014/15</b>					<b>-6,930</b>

Information on the cashflow statement 2013/14	Cashflow from			Cash Net-Increase/decrease	Dividends paid to non-controlling shareholders
	Operations	Investing activities	Financing activities		
KTS CZ	10,211	-114	-13,233	-3,135	-6,352
KTS Poland	167	9	0	176	0
ETC	-18,532	-34	21,765	3,199	0
TMT	11,405	-739	-9,283	1,384	-331
KTS Austria	9,780	-42	-10,725	-988	-216
KTS Belarus	-23,755	-2,488	19,260	-6,983	0
Remaining					0
<b>2013/14</b>					<b>-6,898</b>

The information mentioned above relate to amounts before intercompany eliminations.

### 30 Related parties.

The following transactions were performed with related parties:

#### **KAPSCH-Group Beteiligungs GmbH, Vienna**

Since January 2005 the company has provided services to the group in the area of group consolidation and legal advice. Expenses incurred by the group in the fiscal year 2014/15 amounted to TEUR 624 (2013/14: TEUR 511). Furthermore, the company invoices insurance costs (directors & officers liability insurance) to the group amounting to TEUR 22 (2013/14: TEUR 22).

In fiscal year 2014/15 the company sold 3% of its shares in Kapsch Telematic Services GmbH, Vienna, to Kapsch TrafficCom AG. After this transaction, the group is the sole shareholder of Kapsch Telematic Services GmbH, Vienna (see Note 28). The purchase price consists of a fixed purchase price component (TEUR 2,000) and a variable purchase price component (earn-out component, that depends on the earnings before interest and taxes (EBIT) of the KTS Group, net of non-controlling interests, of the financial years 2015-2018) and amounts to TEUR 4,036 as of 31 March 2015 (the fixed purchase price component has been already paid, the earn-Out in the amount of TEUR 2,036 is recorded under other non-current liabilities, see Note 24).

KAPSCH-Group Beteiligungs GmbH acts as the tax group leader in a tax group formed in March 2005, of which Austrian subsidiaries of this group are also members. Accordingly, all tax effects of the group companies that are tax group members are considered to be related party transactions.

#### **Kapsch Aktiengesellschaft, Vienna**

In connection with the use of the KAPSCH trademark and logo, the company invoices license fees to the group. The license fee amounts to 0,5% of all third-party sales of the group. Expenses incurred by the group in the fiscal year 2014/15 amounted to TEUR 2,199 (2013/14: TEUR 2,330).

Activities in the area of corporate development, public relations, sponsoring and other marketing activities are carried out centrally by Kapsch Aktiengesellschaft for all group companies. Cost allocated to the group in the fiscal year 2014/15 amounted to TEUR 1,722 (2013/14: TEUR 2,018).

Furthermore, the company invoices management and consulting services (including costs for the chairman of the executive board of the company, Georg Kapsch, and costs for consulting services of certain supervisory board members of the company amounted to TEUR 90 (2013/14: TEUR 160) to the group. Expenses incurred by the group in the fiscal year 2014/15 amounted to TEUR 1,470 (2013/14: TEUR 1,228).

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Kapsch Aktiengesellschaft has entered into various insurance contracts covering all group companies, The cost allocated to the group in the fiscal year 2014/15 amounted to TEUR 611 (2013/14: TEUR 603). In addition Kapsch Aktiengesellschaft maintains a software tool and invoiced TEUR 130 (2013/14: TEUR 70) to the group for this service.

**Kapsch Partner Solutions GmbH, Vienna**

The company provides human resources services (payroll services, administration, recruiting, advice on labor law and human resources development) to the group and provides apprentices and trainees. Expenses incurred by the group in the fiscal year 2014/15 amounted to TEUR 2,181 (2013/14: TEUR 2,362).

Kapsch Components GmbH & Co KG provides logistic services to the company amounting to TEUR 7 (2013/14: TEUR 8).

**Kapsch Financial Services GmbH, Vienna**

The company leases telephone and IT equipment (hardware and software) to the group and provides call center services and IT support, Expenses incurred by the group in the fiscal year 2014/15 amounted to TEUR 877 (2013/11: TEUR 1,125).

**Kapsch BusinessCom AG, Vienna**

The company delivers hardware (IT equipment) on behalf of Kapsch TrafficCom AG, Vienna, and provides maintenance and other services for various customer projects, the four largest of which by far are the “truck toll collection system Austria”, the “truck toll collection system Czech Republic”, the “truck toll collection system Poland” and the “truck toll collection system of the Republic of Belarus”. The deliveries and services performed amounted to TEUR 3,592 in the fiscal year 2014/15 (2013/14: TEUR 4,395).

The company provides IT, data processing and telephone services to the group amounting to TEUR 5,498 (2013/14: TEUR 5,021), as well as other services amounting to TEUR 111 (2013/14: TEUR 354).

The group invoices consulting services in the area of public relations to the company. Income of the group resulting from these services in the fiscal year 2013/14 totaled TEUR 32. The agreement had been dissolved and no such income was recognized in the fiscal year 2014/15.

Kapsch Components GmbH & Co KG provides logistic services to the company amounting to TEUR 76 (2013/14: TEUR 74) and other services amounting to TEUR 185 (2013/14: TEUR 27).

**Kapsch CarrierCom AG, Vienna**

Kapsch TrafficCom AG provides services in the area of public relations to the company, Income of the group resulting from this service in the fiscal year 2013/14 amounted to TEUR 29. The agreement had been dissolved and no such income was recognized in the fiscal year 2014/15.

Kapsch Components GmbH & Co KG provides logistic services to the company amounting to TEUR 736 (2013/14: TEUR 788), manufacturing services for GSM-R amounting to TEUR 7,433 (2013/14: TEUR 4,659) and provides the company with other deliverables and performances amounting to TEUR 120 (2013/14: TEUR 132).

**Kapsch CarrierCom France SAS, Paris**

Kapsch Components GmbH & Co KG provides manufacturing services to the company for GSM-R projects amounting to TEUR 6,105 (2013/14: TEUR 12,380) and provides the company with other logistic services amounting to TEUR 169 (2013/14: TEUR 136).

**Kapsch CarrierCom s r.o., Prag**

The company supplies hardware (IT-equipment) to the group for a customer project and provides other services for the project in in the Czech Republic. The value of goods and services delivered in the fiscal year 2014/15 amounts to TEUR 171 (2013/14: TEUR 0).

**Kapsch BusinessCom s r.o., Prague**

The company provides technical maintenance services for the Czech truck toll collection system and is responsible for the current IT support for the Czech subsidiaries. Expenses incurred for this in the fiscal year 2014/15 totaled TEUR 3,709 (2013/14: TEUR 3,759). Furthermore, the company provided public relations services amounting to TEUR 90 in the fiscal year 2014/15 (2013/14: TEUR 94) and other services amounting to TEUR 93 (2013/14: TEUR 138).

**Kapsch Sp, z o.o., Warsaw**

Die Company provides hardware (IT equipment) to the group and renders maintenance and other services for the customer project in Poland. These services amounted to TEUR 2,031 in the fiscal year 2014/15 (2013/14: TEUR 2,181).

**Kapsch Immobilien GmbH, Vienna**

The company provides services in the area of motor vehicle management and automotive services amounting to TEUR 150 (2013/14: TEUR 140) in the fiscal year 2014/15.

**Other related parties transactions**

Lease income of the group resulting from the sub-lease to related parties in the fiscal year 2014/15 totaled TEUR 491 (2013/14: TEUR 518). Services are usually negotiated with related parties on a cost-plus basis. Goods are bought and sold at arm's length.

The former member of the Managing Board of Kapsch TrafficCom AG, Vienna, Ing. Erwin Toplak received a dividend for his shareholding in Kapsch Telematic Services GmbH, Vienna in the amount of TEUR 195 in the fiscal year 2014/15 (2013/14: TEUR 216). Ing. Erwin Toplak has sold his shares in the meantime and has no shares in Kapsch Telematic Services GmbH, Vienna as of 31 March 2015.

Liabilities for pension benefits include pension obligations (pensions in payment) to the widow of Dr, Karl Kapsch, a former board member of Kapsch Aktiengesellschaft.

The following tables provides an overview of revenues and expenses in the respective fiscal years as well as receivables from and payables due to related parties at the respective balance sheet dates:

	2014/15	2013/14
<b>Parent company</b>		
Revenues	0	0
Expenses	646	619
<b>Affiliated companies</b>		
Revenues	15,565	18,876
Expenses	23,867	24,738
<b>Other related parties</b>		
Revenues	184	148
Expenses	1,027	1,265

	2014/15	2013/14 (adjusted)
<b>Parent company</b>		
Trade receivables and other assets	0	0
Trade payables and other payables	4,360	5,268
Liabilities from share purchase	2,036	0
<b>Affiliated companies</b>		
Trade receivables and other assets	2,107	3,113
Trade payables and other payables	3,738	4,646
<b>Other related parties</b>		
Trade receivables and other assets	127	1,218
Trade payables and other payables	289	290

### 31 Earnings per share.

Earnings per share (basic earnings) are calculated by dividing the result for the period attributable to equity holders of the company by the weighted average number of ordinary shares in issue during the year, excluding, if any, ordinary shares purchased by the Company and held as treasury shares. As of 31 March 2014, as in the prior year, no treasury shares were held by the company. There were no dilutive effects.

	2014/15	2013/14
Result for the period attributable to equity holders of the company (in EUR)	3,629,908	-4,299,498
Weighted average number of ordinary shares	13,000,000	13,000,000
<b>Earnings per share (in EUR)</b>	<b>0.28</b>	<b>-0.33</b>

### 32 Events after the balance sheet date.

On 14 April 2015 the group acquired a controlling interest in Streetline, Inc., California. Streetline is a leading smart parking company that offers intelligent data and modern analytics to solve parking space problems for end users.

Consideration paid	189
Less fair value of net assets acquired (provisionally determined)	-189
<b>Goodwill</b>	<b>0</b>

Assets and liabilities resulting from the acquisition are shown as follows (provisionally determined):

	Fair value
Property, plant and equipment	1,251
Intangible assets	46
Receivables and other assets	580
Cash and cash equivalents	2,732
Liabilities, other liabilities and deferred income	-4,399
<b>Net assets acquired</b>	<b>210</b>
thereof controlling interest (90 %)	189
thereof non-controlling interest (10 %)	21



On 28 April 2015, Kapsch TrafficCom made holders of the corporate bond a buyback offer at a rate of 105.75 %, valid until 19 May 2015. This offer was utilized at a nominal value of TEUR 4,182. The purchased debt instruments were submitted to the Oesterreichische Kontrollbank (OeKB) for redemption on 22 May 2015, leaving the corporate bond with an outstanding volume of TEUR 70,818 with maturity on 3 November 2017.

### 33 Supplementary disclosures.

The average number of staff in the fiscal year 2014/15 was 3,313 salaried employees and 196 waged earners (2013/14: 2,973 salaried employees and 199 waged earners).

#### Expenses for the auditor

The expenses for the auditor amount to TEUR 199 (2013/14: TEUR 147) and are broken down as follows:

	2014/15	2013/14
Audit of the consolidated financial statements	55	55
Other assurance services	65	57
Tax advisory services	0	0
Other services	79	34
<b>Total</b>	<b>199</b>	<b>147</b>

#### Compensation and other payments to members of the executive and the supervisory board

In the fiscal year 2014/15, the following persons served on the executive board:

Mag. Georg Kapsch (Chief Executive Officer)  
André Laux

The compensation paid to members of the executive board is shown below:

	Fix 2014/15	Variable 2014/15	Total 2014/15	Total 2013/14
Georg Kapsch	601	42	643	519
Erwin Toplak	0	0	0	451
André Laux	372	100	472	427
<b>Total</b>	<b>972</b>	<b>142</b>	<b>1,114</b>	<b>1,398</b>

Expenses for termination benefits after use of provision for members of the executive board amount to TEUR 59 (2013/14: TEUR 59).

Individual pension agreements are granted to André Laux and Erwin Toplak, TEUR 10 (2012/13: TEUR 24) were paid by Kapsch TrafficCom AG to an external pension fund.

In the fiscal year 2014/15, the following persons served on the supervisory board:

Dr. Franz Semmerneegg (Chairman)  
Dr. Kari Kapsch (Deputy-Chairman)  
Sabine Kauper  
Dr. Harald Sommer

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Delegated by the works council:

Ing. Christian Windisch

Claudia Rudolf-Misch (until 19 November 2014)

Manfred Schmid (from 20 November to 10 March 2015)

Martin Gartler (since 11 March 2015)

Remunerations paid to supervisory board members (inclusive travel costs) amounted to TEUR 46 (2013/14: TEUR 20) in total.

As in the previous years, no advances or loans were granted to members of the executive and supervisory board, nor any guarantees issued in their favor.

Authorized for issue:

Vienna, 8 June 2015



Mag. Georg Kapsch  
Chief Executive Officer



André Laux  
Executive board member

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# Auditor's Report.

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## Report on the Consolidated Financial Statements.

We have audited the accompanying consolidated financial statements of Kapsch TrafficCom AG, Vienna, for the fiscal year from 1 April 2014 to 31 March 2015. These consolidated financial statements comprise the consolidated balance sheet as of 31 March 2015, the consolidated statement of comprehensive income, the consolidated cash flow statement and the consolidated statement of changes in equity for the fiscal year ended 31 March 2015, and the notes to the consolidated financial statements.

### **Management's Responsibility for the Consolidated Financial Statements and for the Accounting System**

The Company's management is responsible for the group accounting system and for the preparation and fair presentation of the consolidated financial statements in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU and in accordance with the statutory provisions of Section 245a UGB. This responsibility includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; making accounting estimates that are reasonable in the circumstances.

### **Auditor's Responsibility and Description of Type and Scope of the Statutory Audit**

Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit in accordance with laws and regulations applicable in Austria and Austrian Standards on Auditing as well as in accordance with International Standards on Auditing (ISA) issued by the International Auditing and Assurance Standards Board (IAASB) of the International Federation of Accountants (IFAC). Those standards require that we comply with professional guidelines and that we plan and perform the audit to obtain reasonable assurance of whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the group's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of the group's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management as well as evaluating the overall presentation of the consolidated financial statements.

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We believe that the audit evidence we have obtained is sufficient and appropriate to provide a reasonable basis for our audit opinion.

**Opinion**

Our audit did not give rise to any objections. In our opinion, which is based on the results of our audit, the consolidated financial statements comply with legal requirements and give a true and fair view of the financial position of the group as of 31 March 2015 and of its financial performance and its cash flows for the fiscal year from 1 April 2014 to 31 March 2015 in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU.

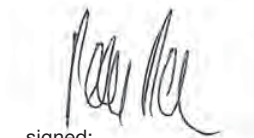
## Comments on the Management Report for the group.

Pursuant to statutory provisions, the management report for the group is to be audited as to whether it is consistent with the consolidated financial statements and as to whether the other disclosures are not misleading with respect to the Company's position. The auditor's report also has to contain a statement as to whether the management report for the group is consistent with the consolidated financial statements and whether the disclosures pursuant to Section 243a UGB are appropriate.

In our opinion, the management report for the group is consistent with the consolidated financial statements. The disclosures pursuant to Section 243a UGB are appropriate.

Vienna, 8 June 2015

PwC Wirtschaftsprüfung GmbH



signed:

Mag. Peter Pessenlehner

Austrian Certified Public Accountant

## **Kapsch TrafficCom AG, Vienna**

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# Management Report

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## Kapsch TrafficCom AG, Vienna as of 31 March 2015

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### 1 Economic climate.

#### 1.1 General economic situation

##### Global economy

The global economy expanded by 3.4 % in 2014 just as in the previous year. While the first half of the year was characterized by reserved growth, the international economy clearly picked up speed in the months that followed. The economic developments in the individual regions varied highly. While the economies of the U.S.A. and Great Britain gained momentum and the emerging markets and developing economies continued their solid performance, other regions lagged significantly behind expectations. A significant economic downturn was observed in the Commonwealth of Independent States, and Japan even suffered a slight decline in total economic production. In the euro zone, economic developments improved in comparison with 2013 but still remained largely weak. The International Monetary Fund (IMF) predicts global economic growth of 3.5 % for 2015, although the individual economic regions will continue to develop very differently. Risks for the global economy include uncertainties on the financial markets, geopolitical crises and price volatility on the commodities markets.

##### U.S.A.

The U.S. economy expanded in 2014 by 2.4 % following 2.2 % in the year 2013. Especially in the second half of the year, the economy was boosted by high consumer spending and investment. The significantly reduced unemployment rate as well as rising real income and improved corporate balance sheets will further promote future growth in the U.S.A. Against this background, the IMF expects a growth rate of 3.1 % for 2015. The stronger U.S. dollar does represent a challenge, since it could lead to a reduction in net exports.

##### Emerging Markets and Developing Economies

The economies of this group of countries have gradually lost some momentum over recent years. Economic growth declined in 2014 to 4.6 %, down from a 5.0 % rate of expansion in 2013 and 7.5 % in 2010.

The economy of the Commonwealth of Independent States (CIS) came under increasing pressure in 2014 from the ongoing Russia-Ukraine conflict and the drastically fallen oil price. GDP growth slowed to 1.0 % after the previous year saw the economy expand by 2.2 %. Russia achieved a GDP growth of only 0.6 % in 2014 due to flight of capital, worse refinancing options for Russian banks on the international capital market and weak oil prices. The heavily damaged trust in Russia as a business location alongside international sanctions and the drop in the oil price can be expected to further intensify the already precarious economic situation. In addition, falling real income is dampening private consumption.

Asia remained the most rapidly expanding economic region in the world with GDP growth in 2014 of 6.8 % (after 7.0 % in the previous year). In China, however, the economy clouded over in response to declining consumption, softening of the real estate boom and lower investment. The growth rate declined from 7.8 % in the previous year to 7.4 %. A further cooldown in investment activity can be expected, leading to a growth forecast of only 6.8 %. Economic developments also lost some momentum in the ASEAN-5 region (Indonesia, Malaysia, Thailand, the Philippines and Vietnam).

Growth-inhibiting trends dominated in Latin America (including the Caribbean), resulting in economic growth of only 1.3 % after 2.9 % growth in the previous year. While countries such as Brazil, Argentina and Venezuela had to accept significant slowdowns in some cases due to falling commodity prices, lower foreign demand and structural problems, the economies of Central America benefited from impulses coming out of the U.S.A.

Muted growth was also observed in sub-Saharan Africa, while the MENAP region (Middle East, North Africa and Pakistan) was able to slightly improve on its macroeconomic performance of the previous year: After GDP growth of 2.4 % in 2013, economic output grew in 2014 by 2.6 %. For 2015, the IMF predicts growth of 2.9 %.

### **Europe**

Economic developments in Europe were characterized by a weak dynamic in 2014. GDP growth in the EU-28 was only 1.3 %. Major factors here included the Russia-Ukraine conflict, curbed global trade, low industrial production and the threat of a deflation spiral. Nevertheless, positive developments were also seen in individual countries. The economy of Great Britain expanded strongly again for the first time in years at 2.6 %. Spain and Portugal also declined additional international assistance on the basis of clear indications of an upswing. Even crisis-plagued Greece exhibited slight GDP growth after six years of recession. Prospects are good for a stronger expansion of the European economy in 2015. In concrete terms, the economic output of the EU-28 is expected to increase by 1.7 %.

The economy of the euro region recovered more slowly than the EU overall in 2014, with economic output rising by only 0.8 %. In contrast to the year before, this is not attributable to the tense situation in peripheral states but rather to the weak growth in the core countries of the currency union. Against this backdrop, the European Central Bank passed a number of measures in 2014 for promoting the flow of credit into the real economy. The key interest rate has been lowered to a record low of 0.05 % and the selective granting of long-term loans to banks was encouraged. In addition, a comprehensive purchase program of covered bonds and asset-backed securities was initiated. Alongside these monetary measures, the economy should also profit from a new EU-wide investment initiative.

The economic developments in Central and Southeastern Europe also lagged behind expectations in 2014. The main causes for this lie in subdued demand from the large economies in the euro zone and the conflict between Russia and Ukraine. A heterogeneous picture can be seen in the individual countries. While relative strong growth was observed in Poland (+3.3 %), the Czech Republic (+2.0 %), Slovakia (+2.4 %) and Hungary (+3.5 %), the Balkan countries were confronted with economic downturns as a result of structural problems and catastrophic floods in spring 2014. With regard to 2015, only moderate growth is expected for Central and Southeastern Europe.

### **Austria**

Compared with Europe in general, the economic dynamic in Austria was weak in 2014. The gross domestic product increased by only 0.3 % over the previous year. For 2015, economists predict only a slight acceleration of growth to 0.5 %. Foreign trade may supply some positive momentum here. Specifically, real growth in goods exports should grow since the depreciation of the euro against the dollar primarily has a positive impact on the competitiveness of the domestic export business outside of Europe.

## 1.2 Development of the market for intelligent transportation systems (ITS)

Kapsch TrafficCom addresses the market for intelligent transportation systems (ITS). ITS employ information and communication technologies to support and optimize road transportation, including infrastructure, vehicles, users and industry.

### Market segmentation

The study "Intelligent Transportation Systems - A global strategic business report" from Global Industry Analysts, October 2012, describes the ITS market as a diversifying market with widely differing application and product segments. Thus, the market comprises the following three product segments:

**Electronic toll collection (ETC)** enables drivers to pay toll fees without stopping at toll stations.

**Traffic management systems (TMS)** monitor traffic, optimize signal timing and regulate the flow of traffic.

**Other intelligent transportation systems (OTH ITS)** comprise in particular

- ▶ Commercial vehicle operations (CVO) encompassing systems for operating commercial vehicles in order to enhance freight carrier productivity and safety,
- ▶ Public vehicle transportation management systems (PVTMS) facilitating management of both local and long-distance public transportation, and
- ▶ Advanced vehicle information systems (AVIS) transmitting traffic-related vehicle information to travelers before or during the trip or provide navigation services.

### Market volume and growth

Global Industry Analysts (October 2012) estimated that the global volume of the ITS market amounted to USD 16.8 billion in 2014 and is expected to continue growing. The largest product segment in 2014 was Other Intelligent Transportation Systems, accounting for almost 39 % (USD 6.5 billion). Based on a worldwide volume of about USD 4.4 billion, ETC had an ITS market share of about 26 %. The largest geographic region for ITS in 2014 was the U.S.A. at 40 %, followed by Europe at 29 %.

The ITS market is expected to grow at an average annual rate of 8.7 % between 2009 and 2018 to reach a global volume of USD 22.8 billion in 2018, of which ETC will account for USD 6.8 billion, equaling a share of 30 % and thereby exhibiting the fastest growth of all product segments at an average annual rate of 11.8 %.

### Global ITS market by product segment and by geographic regions (in USD billion)

	2009	2014	2018
TMS	4.2 (39%)	5.9 (35%)	7.5 (33%)
ETC	2.5 (23%)	4.4 (26%)	6.8 (30%)
OTH	4.1 (38%)	6.5 (39%)	8.5 (37%)
	10.7	16.8	22.8

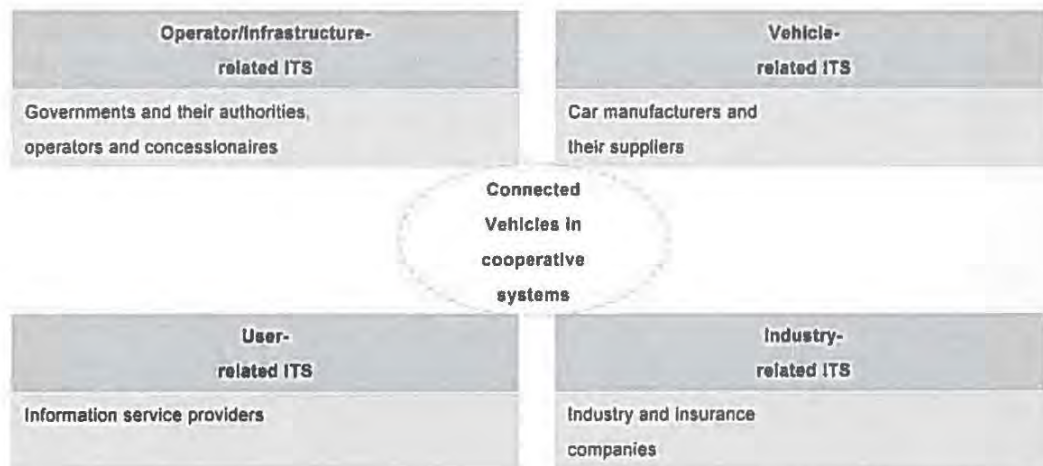
	2009	2014	2018
U.S.A.	42%	40%	44%
Europe	28%	29%	27%
Japan	16%	16%	11%
China	5%	6%	10%
Other	9%	9%	8%
	10.7	16.8	22.8



The past three years have shown that trends on the ITS market have arisen – in part due to economic conditions – that significantly influenced the developments. Due to a lack of current studies, it is difficult to estimate how much the current market volume deviates from these forecasts from the year 2012.

### Customer segments

Kapsch TrafficCom has developed its own understanding and view of the ITS market in order to define and develop its own market positioning. From this perspective, the ITS market was divided into four customer segments and the corresponding primary addressees were identified.



**Operator/Infrastructure-related ITS** encompasses both ETC and TMS as well as applications for urban access and parking. The addressees are governments and their authorities, road and toll operators as well as concessionaires, that develop transport policies using ITS to ensure the availability and quality of the infrastructure in a way that improves safety, performance, security and environmental protection.

**Vehicle-related ITS** aims at in-car telematics such as remote diagnostics or driver assistance systems (AVIS). They are intended mainly to enhance vehicle productivity, particularly that of commercial vehicles (CVO), as well as traffic safety and security. Addressees are mainly car manufacturers and their suppliers. This field also includes systems for real-time interaction between vehicles (vehicle-to-vehicle; V2V) as well as between vehicles and infrastructure (vehicle-to-infrastructure; V2I), collectively abbreviated as V2X, which Kapsch TrafficCom believes will be based on 5.9 GHz technology.

**User-related ITS** focuses mainly on convenience and efficiency for travelers. The customer in the car receives information to aid in orientation during the journey, thereby increasing traffic safety. Example applications for advanced vehicle information systems (AVIS) include transmitting traffic-related vehicle information to travelers before or during the trip as well as navigation services. Addressees are information service providers such as mobile network operators, radio broadcasters and vendors of portable navigation devices.

**Industry-related ITS** encompasses commercial applications designed to reduce the costs or maximize the yield of vehicle fleet operators, including public transportation companies (PVTMS). Example applications include systems for fleet management and for collecting information on the logistics of large-scale vehicle operators. Among the addressees are insurance companies, who see pay-as-you-drive car insurance as a promising way to attract new customers by offering fair insurance rates and ITS-based value-added mobility services.

### **Market positioning**

The current focus of Kapsch TrafficCom aims at the operator/infrastructure-related segment of the ITS market. The goal is to become a leading provider of solutions and technologies in the future field of "Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication – V2X". With this, Kapsch TrafficCom intends to offer solutions at both the infrastructure and vehicle levels, supplying the information and communication technologies as well as designing, building and operating select applications. The future focus will therefore also be on vehicle-related and user-related ITS and the ongoing developments in industry-related ITS will be monitored as well.

### **Market situation and market drivers**

Kapsch TrafficCom believes that the following six factors are the main drivers for the market which it currently addresses:

**Funding for infrastructure projects.** The worldwide increase in number of cars and the growing road traffic as a consequence of the global population growth require additional financing to construct new and maintain existing roads. Toll collection offers a constant source of income and thus helps to provide the necessary funding for infrastructure projects. Efficient toll collection systems, especially electronic ones, offer a significant, constant and sustainable source of additional funds for governments and their authorities, road and toll operators as well as concessionaires that can be used for the expansion and maintenance of road infrastructure.

**Urbanization.** The urbanization is the second megatrend next to the global population growth driving the ITS market in the view of Metalan Research. In large conurbations and capital cities, there is a growing need for electronic systems to control and reduce traffic. Toll collection is largely perceived as an effective solution for reducing high levels of congestion, as mandatory payments for road usage encourage carpooling or the use of public transportation. Systems for city charging and enforcing low-emission environmental zones are deployed by cities to reduce traffic congestion and environmental pollution. Traffic safety devices to monitor compliance with traffic regulations are another field of ITS applications in cities. Examples include systems to monitor traffic violations at junctions (e.g. running red lights).

**Reducing congestion and further environmental pollution caused by road traffic.** Efforts to reduce environmental pollution caused by road traffic have become a market driver for the introduction of toll collection systems. Such systems encourage reduced or modified vehicle usage, thereby lowering emissions and pollution levels. Electronic toll collection systems, in particular for multi-lane free-flow traffic, have proven their ability to decrease environmental pollution and carbon dioxide emissions by reducing congestion at toll plazas without interfering with the traffic flow.

**Increasing traffic safety and security.** Governments and their authorities, road and toll operators as well as concessionaires, are particularly engaged in improving the availability and quality of traffic infrastructure in a way that increases safety and security. Traffic management systems (market segment TMS) lower accident rates while also helping increase the probability of surviving accidents.

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**Enhancing vehicle and fleet productivity.** Car manufacturers and their suppliers are aimed at enhancing vehicle productivity, particularly that of commercial vehicles. In addition, cost reduction and yield increase are becoming more and more important in the operation of vehicles. Vehicle-oriented ITS are aimed at in-car telematics such as remote diagnostics or advanced driver assistance systems (market segment CVO). Their purpose is mainly to enhance vehicle productivity as well as traffic safety and security. Commercial applications of vehicle operations including public vehicle transportation (market segment PVTMS) support fleet management and collect information on the logistics of large-scale vehicle operators.

**Increased comfort expectations of travelers.** Greater convenience and efficiency for users generally also means higher traffic safety. Model applications include vehicle information systems that forward traffic-relevant data to the vehicle driver before and during travel as well as navigation services. Information service providers such as mobile network operators, radio broadcasters and vendors of portable navigation devices are all interested in the further development of such systems. As communication platform, the 5.9 GHz technology will allow to make use of several applications within the „connected vehicle“.

### **Technology**

Depending on the requirements of the specific application, systems are used for toll collection which are based on microwave technology (dedicated short-range communication; DSRC), satellite navigation (global navigation satellite system; GNSS), or video technology using automatic number plate recognition; ANPR). While in Europe the DSRC technology is predominantly based on 5.8 GHz according to the Comité Européen de Normalisation (CEN) standard, electronic toll collection systems in North America are based on proprietary protocols in the 915 MHz band. In addition to the toll application, the communication standard 5.9 GHz WAVE (Wireless Access in the Vehicular Environment) is intended for real-time vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication.

### **Convergence on the ITS market**

A common thread among all these market drivers and technologies is a convergence on the ITS market. Kapsch TrafficCom has realized that product and customer segments are becoming increasingly interconnected in view of future solutions and is convinced that applications, platforms and technologies will finally converge. In the view of Kapsch TrafficCom, the future lies in the interaction between vehicles (vehicle-to-vehicle; V2V) and vehicle to infrastructure (vehicle-to-infrastructure; V2I), collectively abbreviated "V2X" in English. The driving forces in this convergence are governments and the automotive industry.

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## 2. Economic situation of Kapsch TrafficCom AG

### 2.1 General situation

In fiscal year 2014/15, Kapsch TrafficCom AG generated net sales in the amount of EUR 144.7 million, meaning a decline of 18.4 % year on year. The segment Services, System Extensions, Components Sales (SEC) contributed 72.5 % to the generated net sales and thus represents the recurring part of business. At 27.5 %, the segment Road Solution Projects (RSP), representing the project business, contributed less to net sales compared to the previous fiscal year.

In Austria, about 2,200 km of highways and expressways are equipped with fully electronic toll systems for trucks above a maximum authorized vehicle weight of 3.5 tons, with Kapsch TrafficCom AG delivering the complete central and roadside infrastructure for almost 490 toll stations and now about 1 million on-board units (GO boxes) since 2004. As in the previous year, the average toll transaction rate generated in Austria remained at the high prior-year percentage of 99.8 %. On 27 September 2011, the company reached a basic agreement with ASFINAG Maut Service GmbH to renew the current operation and maintenance agreement for the nationwide electronic truck toll collection system in Austria until the end of 2018, with the renewal until June 2017 having already been ultimately confirmed by ASFINAG Maut Service GmbH.

The following changes and events subject to Austrian corporate law occurred in fiscal year 2014/15:

- ▶ On 27 August 2014, Kapsch TrafficCom KGZ, Bishkek, Kyrgyzstan, was re-established.
- ▶ On 10 September 2014, Kapsch TrafficCom Lietuva, Vilnius, Lithuania, was established in cooperation with a local partner.

### 2.2 Financial performance indicators

#### a. Earnings situation

Net sales of Kapsch TrafficCom AG reached EUR 144.7 million in fiscal year 2014/15, thus down by 18.4 % on the previous year (EUR 177.3 million). The segment Services, System Extensions, Components Sales (SEC) exhibited a growth in net sales from EUR 94.4 million in the previous year to EUR 104.9 million. The segment Road Solution Projects (RSP) generated net sales in the amount of EUR 39.8 million (previous year EUR 82.9 million).

In comparison with the previous year, personnel expenses remained almost unchanged at EUR 43.4 million (previous year EUR 43.2 million), although the average number of staff rose by 6 persons from 546 to 552 in the fiscal year under review.

Other operating expenses fell by EUR 7.0 million from EUR 47.9 million to EUR 40.9 million in fiscal year 2014/15.

The operating result (EBIT) of Kapsch TrafficCom AG fell to EUR 17.8 million in the reporting year compared to EUR 20.6 million in the previous year.

The financial result of EUR 8.0 million (previous year: EUR 8.4 million) is mainly attributable to the income from investments.

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**b. Assets and liabilities**

The balance sheet total of EUR 378.4 million at the balance sheet date 31 March 2015 fell by EUR 6.5 million compared to the end of fiscal year 2013/14 (31 March 2014: EUR 384.9 million).

At EUR 221.1 million, equity exceeded the amount of EUR 200.3 million as of 31 March 2014. Kapsch TrafficCom AG's equity ratio thus increased from 52.0% as of 31 March 2014 to 58.4 % as of 31 March 2015.

On the assets side, inventories decreased from EUR 32.3 million to EUR 7.5 million.

The group receivables (incl. borrowings) fell from EUR 233.5 million in the previous year to EUR 224.5 million in the reporting year, thus affecting liquid funds that rose from EUR 7.4 million to EUR 30.0 million.

On the liabilities side of the balance sheet, long-term liabilities in particular fell from EUR 109.8 million in the previous year to EUR 89.5 million as of the balance sheet date 31 March 2015.

The short-term liabilities decreased from EUR 69.4 million in the previous year to EUR 62.0 million as of the balance sheet date 31 March 2015. The group liabilities showed a decline from EUR 19.8 million in the previous year to EUR 18.5 million as of 31 March 2015. At EUR 21.8 million in the reporting year, the short-term bank loans and overdrafts remained almost unchanged compared to the previous year.

**c. Financial position**

The net cash flow from operating activities amounted to EUR 34.6 million after EUR -5.9 million in the comparative prior-year period. This development was particularly attributable to the decrease in inventories and trade receivables.

The net cash flow from investing activities in the amount of EUR 8.8 million (previous year: EUR -28.7 million) mainly results from the financing of subsidiaries.

The net cash flow from financing activities in the amount of EUR -20.7 million (previous year: EUR 18.4 million) resulted from the repayment of financial liabilities. In total, cash and cash equivalents increased from EUR 7.4 million as of 31 March 2014 to EUR 30.0 million as of 31 March 2015.

### 3. Additional company information.

#### 3.1 Research and development

Kapsch TrafficCom AG has a global network of research and development centers in Vienna and Klagenfurt (Austria), Jönköping (Sweden), Bologna (Italy), Buenos Aires (Argentina), Mississauga (Canada), Kingston (U.S.A.), Duluth (U.S.A.) and Cape Town (South Africa). Kapsch TrafficCom AG coordinates the development activities in the field of R&D on a worldwide basis.

Research and development (R&D) are a high priority for Kapsch TrafficCom AG with respect to achieving its strategic goals. To ensure the inventiveness of the company, development departments exist for all strategic business fields of Kapsch TrafficCom AG to work on new solutions for customer needs.

The following focal areas were defined in the past fiscal year:

In the back office area, completion of the development of standardized platforms has the highest priority. Additional functionality has been implemented and successfully tested for the use of video tolling in a load scenario.

Investments continue to be made in improving vehicle identification and classification sensors, which are integrated into the inexpensive single-gantry roadside system. The new generation of sensors and infrared lighting increase the measurement accuracy to meet the constantly rising expectations of the market.

In connection with the requirements of the Italian market, Kapsch TrafficCom started an evaluation and prototype development project for DSRC components (on-board unit and transceiver) to enable the communication also with the special Italian radio standard ETSI-HDR.

The completion of the first satellite-based toll system with ITS functionality in France is a milestone for Kapsch TrafficCom AG that adds an important component to the portfolio. This success is based on cooperation between the development locations in Sweden and Austria as well as intensive collaboration with the customer, who is also offering its customers a new feature with this GNSS-based (Global Navigation Satellite System) toll system.

In order to safeguard the existing 5.8 GHz portfolio, it is essential to cover this business field also with other technologies. With the new RFID (Radio Frequency Identification) platform according to ISO 18000-6C, Kapsch TrafficCom AG can also address markets in which RFID sticker tags have already become established or are explicitly in demand. This allows Kapsch TrafficCom to select the specific technology that is best suited to the requirements of the customer. The RFID-MLFF platform expands the solution portfolio for tolling and registration applications to include RFID standard components from third-party providers that already implement ISO 18000-6C/63 (transmission protocols with significantly higher acquisition rates).

To meet the increasing interest in "V2X" solutions (vehicle-to-vehicle and vehicle-to-infrastructure communication), Kapsch TrafficCom AG is cooperating in multiple projects with other companies and institutions in Europe. In addition to defining application scenarios for "V2X" communication as well as their implementation and evaluation, Kapsch TrafficCom is also taking an active part in the required standardization process in the U.S.A. and in Europe. The focus lies on building an end-to-end solution from the traffic control center to the vehicle, as was already successfully presented at the ITS World Congress 2014 in Detroit, U.S.A. The efforts in the area of in-vehicle equipment are concentrated on solutions for connected vehicles in connection with "V2X" technology. Participation in some research projects in cooperation with the automotive industry led to close contact with leading original equipment manufacturers (OEM) and first tier automotive suppliers.

In 2014/15 fiscal year, Kapsch TrafficCom AG invested roughly EUR 33.7 million in research and development (previous year: roughly EUR 42.1 million).

### 3.2. Non-financial performance indicators

#### Sustainability management

Kapsch TrafficCom AG sees itself as particularly committed to the central aspects of sustainability not least due to the business model of the company. The focus lies on achieving the efficient and sparing use of resources of all kinds, securing the profitability and innovative strength and ensuring equal opportunities and fairness with respect to all relevant interest groups. Securing the long-term stability of the company in consideration of all economic, environmental and social perspectives is the overarching goal.

**Consistent sustainability orientation.** Kapsch TrafficCom understands sustainability as a continuous process. In recent years, the company has begun systematizing all the related agendas. One important milestone was reached with the publishing of the third sustainability report in May 2015, which is available at [www.kapsch.net/ktc/investor\\_relations](http://www.kapsch.net/ktc/investor_relations).

The sustainability report satisfies the requirements of the Global Reporting Initiative, GRI Guideline G3.1 (Application Level C). It also serves as a progress report for the United Nations Global Compact, which defines ten principles for protecting human rights and labor standards as well as environmental protection and fighting corruption.

The report provides comprehensive information about the central fields of action:

- Protecting the environment, conserving resources and actively protecting the climate
- Securing the innovative strength
- Product responsibility and quality assurance
- Ensuring the competitiveness and profitability
- Integrity and compliance
- Attractive and responsible employer
- Social responsibility

Figures for success measurement as well as goals for the following period have been defined for each field of action. All such agendas are coordinated by a sustainability officer and reported to the executive board.

### **Innovative products with added value for the environment and society**

The products and solutions for intelligent transportation systems from Kapsch TrafficCom make valuable contributions to climate protection. They allow road users to reach their destinations quickly, efficiently and with low environmental impact. In order that these ambitions can be realized in the future, Kapsch TrafficCom AG invests heavily in research and development.

Comprehensive guidelines were created to ensure that environmental, economic, social, health and safety aspects are ideally taken into account in a structured fashion in the design of products. The contents of these guidelines must be integrated into the specifications and project invitations to tender.

**Quality.** Safeguarding the high standards of quality, safety and robust processes is a high priority in all units of Kapsch TrafficCom Group. Kapsch TrafficCom AG defines its processes in an integrated HSSEQ management system (Health, Safety, Security, Environment, Quality). This system is based on certifications according to ISO 9001 Quality Management (since 2002) as well as OHSAS 18001 Occupational Health and Safety Management and ISO 14001 Environmental Management (since 2005). Kapsch TrafficCom AG has anchored the necessary measures for ensuring the associated standards into its internal processes and continuously monitors compliance. The certificate according to ISO 27001 defines the required information security management. A high service quality is ensured in the area of technical operation with ISO 20000 for IT service management. The HSSEQ Circle meets once per quarter to discuss the status of the goals and measures from the areas of health and safety, quality, the environment and information security and to optimize work processes and information sharing. These aspects are documented in a quarterly report to the executive board.

**Reliability and accuracy of installed systems.** The toll transaction rate is a figure for assessing the accuracy and reliability of a toll collection system. It indicates the number of successful transactions in relation to all potential toll transactions of vehicles equipped with a functioning on-board unit. A high toll transaction rate translates to high toll income.

*The average toll transaction rate of the existing truck toll collection system in Austria was at approximately 99.89 % in 2014 (2013: 99.83 %), the average transaction rate of the nationwide electronic toll collection system in the Czech Republic was approximately 99.6 % 2014 (2013: 99.6 %). The calculation of the average transaction rate is based on methods agreed upon with the respective customer, meaning that comparisons between the average transaction rates achieved in different projects are only possible on a limited basis.*

### **Protecting the environment, conserving resources and actively protecting the climate**

The business activities are associated with the consumption of raw materials and the emission of climate-relevant emissions. Kapsch TrafficCom works intensively on minimizing these impacts. The majority of the climate-relevant effects result from the business activities of the subsidiary Kapsch Components, which is responsible for production as well as the fleet of the entire group. Through measures to increase energy efficiency, but also influenced by a lower production volume, Kapsch Components was able to reduce its energy consumption by 0.7 % in fiscal year 2013/14 following a reduction of 5 % in the previous year. The waste volume per ton of product was reduced by 13.5 % to 135 kilograms and the nitrogen consumption by 5.1 %.



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## **Staff**

The average number of employees of Kapsch TrafficCom AG in fiscal year 2014/2015 was 552 (previous year: 546). As at 31 March 2015, the company employed 512 (previous year: 584).

Kapsch TrafficCom AG places great importance on the continued training and education of its employees. This involves not only promoting professional education but also providing seminars and workshops for developing personal and teamwork skills. In addition, training sessions tailored to the particular needs of employees are offered within the framework of the Kapsch Academy. A job rotation program promotes the international exchange of staff between various locations, and selected employees are prepared for their future tasks in a management trainee program.

Kapsch TrafficCom AG makes contributions to an external pension fund for employees of group companies in Austria under a defined contribution scheme. The amounts of the payments are based on the individual employee's income and the operating profit margin of the company.

Kapsch TrafficCom AG is aware of the employees' contribution to its success and acknowledges this through a profit participation plan. The Kapsch TrafficCom Group rewards the commitment of its employees by distributing to them up to 5 % of the group profit before income taxes. Country-specific upper limits have been established to ensure that the distribution reflects local purchasing power. Every employee receives a share, which is independent of the person's salary or wage and limited to EUR 1,500 per employee.

Kapsch TrafficCom AG is committed to promoting the advancement of women in the workplace. Women are supported through a flexible working hours scheme that is designed to help combine professional and private life. In addition, Kapsch TrafficCom cooperates with schools, universities and universities of applied sciences in order to increase the proportion of women employed, among other goals. The company also promotes women in the workforce through participation in specific programs such as "FIT Frauen In die Technik" or "FemTech". A committee for non-discrimination has been established within Kapsch TrafficCom AG.

The department departments Finance & Administration, Law and Engineering are headed by women.

## **Social responsibility**

Alongside statutory requirements and internal guidelines, the code of conduct of the Kapsch Group defines binding principles for ethically, morally and legally correct behavior that apply to all corporate units – and therefore to all employees of Kapsch TrafficCom. The code of conduct can be found on the website [www.kapsch.net](http://www.kapsch.net).

Additionally, within the scope of internal risk management, all business units over which Kapsch TrafficCom AG has primary influence are audited with regard to their corruption risks, and the employees of the first and second management levels are trained in anti-corruption policy and anti-corruption processes.

In accordance with the corporate values, Kapsch TrafficCom AG accepts social responsibility that extends even beyond its scope of operation and that is widely organized by the Kapsch Group. Only a selection of supported projects and initiatives are presented below.

**Educational institutions.** Technical educational institutions are very important to Kapsch as a technology- and innovation-oriented group. The company is therefore interested in establishing contact as early as possible with students as well as graduates of technical education programs. Alongside the Vienna University of Technology and the UAS Technikum Wien, the Kapsch Group has also subsidized the Universitäre Gründerservice Wien GmbH since 2005. This organization aids young entrepreneurs in transforming ideas into convincing business concepts.

**Development support.** One example of the many social projects supported in Austria and abroad is the institute for Cooperation in Development Projects (ICEP). The goal of this organization is to fight poverty around the world through projects with dependable local partners in many countries. In addition, Kapsch TrafficCom provides funding to projects that promote the integration of marginalized groups through targeted measures, thereby contributing to social justice, positive social development and long-term safety and security.

**Support for art and cultural institutions.** The entire Kapsch Group – headed by Kapsch AG – supports many contemporary art and cultural institutions and projects and even initiates its own projects in this sector.

The Kapsch Group has participated in a general partnership with the Vienna Concert Hall (Wiener Konzerthaus) since 1992 under the motto of "It is an art to make money. It is an obligation to spend money on art." The Vienna Concert Hall offers plenty of space for all culture of high quality. Unusual programs regularly interest new segments of the public without alienating long-term friends of the Concert Hall. The festival "Wien modern" – one of the most famous contemporary music festivals in the world has been supported since 1989.

In the area of visual arts, Kapsch is particularly interested in supporting artists who are still in need of wider recognition. Consideration is therefore given to young artists from Austria and abroad with sponsorship campaigns. The showcase project in this area is the art calendar that the Kapsch Group has published since 1994 and presents annually in late autumn to great fanfare.

### 3.3 Risk Management

Risk management has been positioned as a separate function within the finance department of Kapsch TrafficCom AG, focusing on project risk management and enterprise risk management (ERM).

**Project risk management** analyzes beginning in the bid phase of customer projects in institutionalized processes all relevant opportunities and risks pertaining to the group's projects, thereby providing the basis for the timely planning and implementation of risk-mitigating activities.

**The enterprise risk management (ERM)** analyzes not only the risks of key customer projects but also strategic, technological, organizational, financial, legal and IT risks, and reports them to the executive board and the audit committee of the supervisory board on a quarterly basis. The goal of the ERM approach is early identification, analysis and control of all risks which might influence strategic and operational objectives of the company. The primary objective in this context is not to avoid risks but to deal with risks in a controlled and deliberate manner and to recognize and realize opportunities as they arise over time in order to make a valuable contribution to the management of the company.

The material risks faced by the Kapsch TrafficCom Group and the respective risk management measures are briefly explained below.

### Industry-specific risks

**Volatility of new orders.** A major portion of the revenues of the Kapsch TrafficCom Group is generated in the segment Road Solution Projects (RSP). In this segment, the group regularly participates in tenders for the implementation and operation of large electronic toll collection systems as well as for the collection of tolls on specific road sections as well as for tenders for other solutions from the ITS portfolio. On the one hand, there is a risk that tenders in which the group participates or plans to participate could be delayed or withdrawn, for instance as a result of political changes, appeals or legal actions by unsuccessful bidders. On the other hand, a risk exists that Kapsch TrafficCom may not win its bids for new projects due to technological, financial, formal or other reasons. Recurring revenues from the technical and commercial operation of systems also depend on the successful participation in tenders for systems.

In the past, the revenues of the Kapsch TrafficCom Group have been heavily influenced by the realization of implementation projects in the segment RSP in the given fiscal year. In particular, significantly higher revenues were recorded in 2003 (implementation of a nationwide electronic truck toll collection system in Austria), 2006/07 (implementation of a nationwide electronic truck toll collection system in the Czech Republic), 2010/11 (implementation of an electronic toll collection system in the South African province of Gauteng) and 2011/12 (implementation of a nationwide electronic truck toll collection system in Poland). In fiscal year 2012/13, 2013/14 as well as 2014/15 sizeable revenues were generated from the implementation of a nationwide electronic truck toll collection system in Belarus. In the past fiscal years, revenue contribution from the implementation of projects with a smaller volume have constantly increased.

The strategy of Kapsch TrafficCom AG is aimed, among other things, at reducing this volatility of revenues through increased geographic diversification and increased diversification of the customer base and product portfolio as well as sustained growth in the share of technical and commercial system operation in total revenues in the interest of strengthening the segment Services, System Extensions, Components Sales (SEC).

**Risks of project execution.** In connection with the installation of systems, Kapsch TrafficCom AG is usually contractually obligated to provide performance and time-limit guarantees. Since electronic toll collection systems and other intelligent transportation systems are frequently sophisticated and technologically complex systems that must be implemented within a short timeframe, system and product defects or missed deadlines may occur due to the limited time available. Unexpected project modifications, lack of qualified personnel, quality defects, unexpected technical problems as well as performance problems of suppliers or consortium members may also have a negative impact on project schedules. The failure to meet guaranteed performance levels or deadlines in some cases results in penalties and/or compensation for damages, sometimes also compensation for lost toll revenues. Significant deadline overruns also frequently trigger contractual clauses that enable clients to terminate contracts prematurely. A significant delay in a project, failure to achieve guaranteed performance levels or failure to implement a project in time would also reduce the chances of success in future tenders for systems. There is also the risk that Kapsch TrafficCom Group cannot execute projects in line within the set cost budgets. Due to the strong social opposition to toll systems that is sometimes encountered, the risk of a late or limited rollout of the toll systems exists in many projects, which can have further consequences on payment flows and revenue in the operation project.

Kapsch TrafficCom AG employs risk management methods and project risk management procedures based on IPMA (International Project Management Association) standards in order to guard against risks associated with projects.

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**Long-term contracts with public authorities.** In many cases, the system contracts are awarded by public agencies. Framework agreements and service contracts in connection with toll collection projects may include terms and conditions that are not negotiable in a tender process and that may be disadvantageous to the Kapsch TrafficCom Group. Some long-term contracts include challenging requirements with regard to the performance of the implemented systems, components and processes. These requirements can, if they are not achieved, result in significant penalties, damages or even contract termination. On the other hand, some contracts include substantial bonus payments for over-fulfillment of performance requirements. In the case of long-term contracts, the margins earned can also differ from the original estimates due to changes in costs.

Liabilities arising from contracts concluded by the Kapsch TrafficCom Group may include liabilities regarding customers' loss of profit, product liabilities and other liabilities. While the group aims to include appropriate limitations to its liability in contracts, it is still impossible to guarantee that all contracts contain sufficient limitations to the group's liability or that these limitations can be enforced under applicable law.

### **Strategic risks**

**Capacity for innovation.** The strong market position of Kapsch TrafficCom AG is, to a large extent, based on its ability to develop state-of-the-art, efficient and reliable systems, components and products. Kapsch TrafficCom AG is committed to a permanent and integrated innovation process. In order to maintain its already strong position in technology, Kapsch TrafficCom AG invests a considerable portion of its revenues in research and development activities. However, if the company does not succeed in developing new systems, components and products, this can be detrimental to its competitive position.

Since its capacity for innovation is based largely on technology, internal know-how and intellectual property, the global increase in product piracy and reverse engineering may have negative effects on the group. In addition, any failures in protecting these technologies may have a negative impact on the group's competitive position. Moreover, it is possible that systems, components, products or services could infringe on the intellectual property rights of third parties. Kapsch TrafficCom AG places great importance on the protection of technologies and the company's internal know-how, e.g. through patents and non-disclosure agreements with other parties.

**Acquisition and integration of companies as a part of the group's growth.** One of the strategic objectives of Kapsch TrafficCom AG is to grow internationally both by organic means and through select acquisitions and joint ventures. In the implementation of this strategy, the group has acquired and integrated companies around the world. However, a number of challenges remain in connection with this growth strategy in order to realize the desired synergies and objectives. Opportunities arise from the acquisition of new technologies and market know-how.

**Country risk.** The strong expansion of business activities in Eastern Europe and non-European countries has exposed Kapsch TrafficCom AG to heightened political risks. Significant and unforeseeable political changes can exert a major influence on the ability to implement or operate ITS projects in these countries and can also affect the availability and accessibility of funds. There may also be interference with the property rights of Kapsch TrafficCom AG or complications regarding business practices and activities.

## Financial risks

**Foreign exchange risk.** Kapsch TrafficCom AG maintains branches, offices and subsidiaries in a number of countries outside the euro zone. A considerable portion of revenues and costs are denominated in the currencies of the respective foreign companies rather than in euros. Although the group aims to hedge the net currency position of the individual contracts as necessary, currency fluctuations may result in exchange rate losses that may influence the consolidated financial statements (transaction risk). As a result of the sometimes volatile payment flows in the project business, hedging the associated risks is only possible to a limited extent; the remaining currency rate risk is accepted and taken into account in the company planning. Fluctuations in exchange rates may also result in a change in the competitive position of Kapsch TrafficCom AG.

**Interest rate risk.** Within the framework of project financing, the group regularly agrees to variable interest rates that are tied to market interest rates (Euribor, Pribor, etc.). This exposes Kapsch TrafficCom AG to interest rate risks. Kapsch TrafficCom AG utilizes appropriate financial instruments to hedge against interest rate risks when these risks are significant.

**Liquidity risk.** Sufficient financial resources must be available to ensure that Kapsch TrafficCom AG can meet its payment liabilities at any time. Medium and long-term financing must be available in order to carry out large-scale projects (such as implementing a nationwide toll collection system under delayed payment terms from the client) and for acquiring other companies. Additionally, implementing large-scale projects often requires the provision of significant bank guarantees to secure bid obligations (bid bonds) or to secure possible warranty claims (performance bonds).

In financing agreements, Kapsch TrafficCom AG is subject to the customary restrictions in terms of its business policy, e.g. when drawing additional loans, using assets as collateral or providing guarantees for third parties. The availability of financing and bank guarantees depends on market conditions as well as the net assets and financial position of Kapsch TrafficCom AG and the results of operations. A lack of liquid assets (even if the group is otherwise solvent), of financing or of bank guarantees can have an extremely adverse impact on the net assets and financial position of Kapsch TrafficCom AG and the results of operations.

Liquidity risk is managed by ongoing, company-wide financial and cash planning. Potential liquidity shortages can thus be identified and mitigated.

**Credit risk.** Kapsch TrafficCom AG is exposed to the risk of non-payment by customers. The credit ratings of new and existing customers are checked as needed and secured. Many of the key customers of Kapsch TrafficCom AG are public authorities, especially in connection with implementing and/or operating nationwide or regional toll collection systems. Kapsch TrafficCom AG also increasingly acts as a subcontractor to third parties (concessionaires, general contractors, etc.) in public sector projects.

There is also a risk that the counterparties (including financial institutions assumed to have good credit ratings) of both original and derivative financial instruments cannot meet their payment obligations when due. A payment default or the recognition of impairment charges to receivables can be extremely detrimental to the net assets and financial position of Kapsch TrafficCom AG and the results of operations.

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### **Personnel risks**

The success of Kapsch TrafficCom AG depends heavily on key personnel with many years of experience in the industry. Moreover, the group's ability to recruit qualified staff, integrate them into the company and retain them over the long-term is crucial. The loss of key personnel and difficulties in the recruitment of personnel may adversely affect the success of the group.

Kapsch TrafficCom AG has implemented a number of measures to counteract personnel risks, such as incentive schemes and employee development opportunities.

### **Legal risks**

A variety of regulations and legal requirements must be observed in connection with participating in public tenders, implementing infrastructure for ITS solutions (such as toll stations) and the operation of toll collection systems. Identifying and adhering to applicable legal regulations and requirements can result in considerable administrative and technical expense. The failure to meet regulations or official requirements can lead to severe penalties and can also reduce the possibility of (successfully) taking part in tenders or continuing with the given business activity.

With the expansion into new regions and new ITS business areas, the risk of patent infringement or the violation of property rights increases. Kapsch TrafficCom AG has implemented active intellectual property (IP) management as a separate function. In order to avoid legal actions and court proceedings, the Kapsch TrafficCom Group monitors potential intellectual property rights infringements continuously as well as prior to entry into new markets or regions.

### **IT risks**

As a technology group, Kapsch TrafficCom AG is exposed to typical IT risks relating to security, confidentiality and the availability of data. For this reason, Kapsch TrafficCom AG has implemented an IT risk management system designed according to the corporate risk and IT security application method (CRISAM) and has been certified pursuant to ISO 27001 (information security management). Kapsch TrafficCom AG is also certified according to ISO 20000 "IT service management" (similar to ITIL) for the operation of toll collection systems and promoting the rollout of CRISAM as an IT risk management tool, as it is already the case in Poland and Belarus.

### **Opportunities**

The enterprise risk management approach of Kapsch TrafficCom AG not only addresses risks but also encompasses the regular identification, evaluation and management of opportunities. The goal of these efforts is to manage the strategic orientation of the product portfolio and market activities through the early identification of opportunities and to develop corresponding potential.

**Market opportunities** exist in geographic diversification as well as increasing expansion of the customer and product portfolio, driven in part by the following factors:

Due to the increasing financing requirements of infrastructure projects and the growing need to relieve state budgets, there exists an opportunity to develop new markets, especially in emerging and developing countries, as well as an opportunity to expand our activities into already developed markets.

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The global rise in traffic volumes and the associated impact on the environment and society open up opportunities in the area of traffic management because measures such as toll collection, road pricing and the establishment of environmental zones or access restrictions are increasingly being employed as controlling instruments of environmental and traffic policy. In both the ETC and ITS segments, this is creating opportunities to further develop and market the portfolio according to the requirements.

The drive to increase the productivity of vehicles and vehicle operations as well as the rising comfort expectations of travelers also open up new opportunities for expanding the functionality of existing systems. Opportunities also exist to obtain new customers outside of the public sector, such as in the area of fleet management.

**Other opportunities.** Constant innovation and technical advancements create opportunities for Kapsch TrafficCom AG to improve the efficiency and performance of customer systems as well as to gain a technological edge over competitors with regard to the performance and functionality of the offered systems.

#### **Summary assessment of the risk situation**

From the current perspective, no risks have been identified that could endanger the continued operations of Kapsch TrafficCom AG. Increasing geographic expansion, the diversification of the product and solution portfolio (strengthening of the ITS business) and an increased share of recurring revenues (further growth in the segment Services, System Extensions, Components Sales) are planned to further reduce the concentration of risks in the future.

#### **3.4 Internal Control System (ICS) In regard to the finance process**

Kapsch TrafficCom AG began analyzing and documenting its existing internal processes for financial reporting on an ongoing basis in fiscal year 2009/10. The results obtained so far have been presented at the quarterly meetings of the audit committee for assessment and discussion. The internal audit department ensures by audits of the subsidiaries of Kapsch TrafficCom AG that a reliable and functioning control system is implemented.

The Group IFRS Accounting Manual represents the cornerstone for financial accounting and reporting throughout the whole Kapsch Group. The manual is published and regularly updated by the Kapsch Group and contains the essential financial and reporting procedures based on the International Financial Reporting Standards (IFRS). Groupwide guidelines, work instructions and process descriptions represent another important pillar of the internal control system.

The central elements of the ICS process include regular verification of compliance with the principle of dual control and the segregation of duties as well as defined actions for monitoring the effectiveness and efficiency of operating activities, the reliability of financial reporting and the compliance with relevant legal regulations. The ICS guidelines of Kapsch TrafficCom AG follow the basic structure of the internationally recognized standards for internal control systems (COSO - Internal Control Framework of the Committee of Sponsoring Organizations of the Treadway Commission).

The supervisory board is kept informed of business developments by the executive board during regular meetings by way of consolidated presentations consisting of segment reporting, earnings development analyses with comparisons of current figures to figures from the budget and the previous period, forecasts, group financial statements and developments in the number of employees and order inflow as well as select financial figures.

Within the finance department of Kapsch TrafficCom AG the function of an ICS manager was established. The duty of this function is to standardize and continuously improve the ICS not only for Kapsch TrafficCom AG but also for the entire Kapsch TrafficCom Group, to monitor the compliance and effectiveness of the controls and the improvement of found weaknesses and to report periodically to the audit committee of the supervisory board.

In fiscal year 2013/14 all control processes were documented in order to achieve material control objectives. The collection of data allows an improved control of measures to increase the ICS's efficiency and serves as a basis for future performance assessments of local ICS. In fiscal year 2014/15, this documentation was further improved; and Internal Audit performed the first audit with regard to the local ICS's efficiency.

### **3.5 Disclosures pursuant to Section 267 UGB in connection with Section 243a Para. 1 UGB**

The registered share capital of Kapsch TrafficCom AG amounts to EUR 13.0 million and is fully paid in. It is divided into 13.0 million no-par value ordinary bearer shares.

There are no restrictions relating to the exercise of voting rights or the transfer of shares.

As of 31 March 2015, approximately 36.9 % of the shares of Kapsch TrafficCom AG were in free float. As of 31 March 2015, KAPSCH-Group Beteiligungs GmbH held approximately 63.1 % of the shares. KAPSCH-Group Beteiligungs GmbH is a wholly-owned subsidiary of DATAX HandelsgmbH, whose shares are equally held by Traditio-Privatstiftung, ALUK-Privatstiftung and Children of Elisabeth-Privatstiftung, each a private foundation under the Austrian Private Foundation Act (*Privatstiftungsgesetz*). These are each attributable to members of the Kapsch family. As of 31 March 2015, no other shareholder held more than 10 % of the voting rights in Kapsch TrafficCom AG.

None of the shares convey special control rights.

There are no restrictions regarding the execution of voting rights by employees with a share in the company.

There are no special provisions on the appointment and removal of members of the executive board and the supervisory board and no special provisions regarding the amendment of the articles of association of the company.

Neither authorized capital nor conditional capital currently exists at the company, which empowers the executive board to issue shares with the approval of the supervisory board and without (renewed) consideration by the annual general meeting.

There are no agreements that become effective when a public takeover offer for shares is launched.

There are no agreements between Kapsch TrafficCom AG and members of the executive board or the supervisory board or employees which become effective when a public takeover offer for shares in the company is launched.



#### 4. Material events after the balance sheet date.

On 28 April 2015, Kapsch TrafficCom made holders of the corporate bond a buyback offer at a rate of 105.75 %, valid until 19 May 2015. This offer was utilized at a nominal value of EUR 4,182,000.00. The purchased debt instruments were submitted to the Oesterreichische Kontrollbank (ÖKB) for redemption on 22 May 2015, leaving the corporate bond with an outstanding volume of EUR 70,818,000.00 million with maturity on 3 November 2017.

#### 5. Outlook and targets.

As part of the comprehensive Program 2020, Kapsch TrafficCom defined a future strategy in fiscal year 2014/15 for developing and transforming its business. Three strategic priorities were also defined for the coming years: Operational excellence, secure and grow of the core business areas and inaugurate an intelligent mobility solutions (IMS) business.

The next years will therefore be challenging for Kapsch TrafficCom AG but will also offer many new opportunities. The initiated cost savings will fully take effect over the course of fiscal year 2015/16. The profitability of the core business should then lie at roughly 10 %, as expected, once again leaving sufficient freedom for future investments.

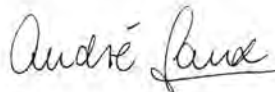
Kapsch TrafficCom AG will concertedly continue existing projects and work to further strengthen its market position with new developments and projects. In the years to come, some existing contracts for operation projects will be put out to tender again. This will be the case in 2016 for the nationwide electronic truck toll system in the Czech Republic and the contract for the technical operation and maintenance of the nationwide electronic truck toll system in Austria, although the latter is confirmed to be continued until June 2017. Kapsch TrafficCom AG will strive to win these tenders again with the best service offer.

The goal of Kapsch TrafficCom AG is to consistently improve the group as well as its solutions, products and services in order to remain among the top providers on the market in the future.

Vienna, 1 June 2015



signed  
Georg Kapsch  
Chairman of the Executive Board



signed  
André Laux  
Member of the Executive Board

# Statement of all Members of the Management Board.

Statement of all Members of the Management Board pursuant to Section 82 Para. 4 No. 3 BörseG (Austrian Stock Exchange Act)

We declare to the best of our knowledge that the financial statements give a true and fair view of the assets, liabilities, financial position and profit or loss of the parent company as required by the applicable accounting standards and that the management report gives a true and fair view of the development and performance of the business and the position of the company, together with a description of the principal risks and uncertainties the company faces.

Vienna, 1 June 2015



Mag. Georg Kapsch

Chief Executive Officer



André Laux

Chief Operating Officer

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## **Additional information**

### **pursuant to Section 82 Para. 4 No. 3 BörseG. (Austrian Stock Exchange Act)**

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<b>Board member</b>	<b>Area of responsibility</b>
Georg Kapsch Chairman/CEO	Finance & Administration, Mergers & Acquisitions, Investor Relations, Compliance, Strategy, Legal Services, International Subsidiaries & Management Systems, Human Resources, Marketing & Communications, Solution Management, Engineering and Sales Region North America
André Laux Member/COO	Sales Region 1 and 2 <sup>1</sup> , Production & Logistics and Delivery & Operations

<sup>1</sup> The sales regions have developed historically and are addressed in the case of Region 1 by Kapsch TrafficCom AG, Austria, and in the case of Region 2 by Kapsch TrafficCom AB, Sweden

## Balance Sheet as of 31 March 2015

## Assets

## Shareholder's Equity and Liabilities

	31/3/2015	31/3/2014		31/3/2015	31/3/2014
	EUR	EUR '000		EUR	EUR '000
<b>A. Fixed assets</b>			<b>A. Shareholder's equity</b>		
I. Intangible assets			I. Share capital	13,000,000.00	13,000
1. Industrial property and similar rights and assets, and licenses in such rights and assets	2,370,667.96	2,727	II. Capital reserves		
2. Prepayments and construction in process	6,885,442.94	6,387	Appropriated	117,400,000.00	117,400
	9,256,110.90	9,114	III. Unappropriated retained earnings, thereof prior period unappropriated retained earnings brought forward EUR 69,878,414.51 (prior year: EUR 46,097k)	90,712,695.41	69,878
II. Tangible assets				221,112,695.41	200,278
1. Investments in leasehold buildings	2,217,659.91	2,647			
2. Technical equipment and machinery	402,587.52	611	<b>B. Investment grants</b>	288,025.22	365
3. Other equipment, factory and office equipment	1,919,496.42	2,137			
4. Prepayments and construction in process	0.00	119	<b>C. Accruals</b>		
	4,539,743.85	5,514	1. Accruals for severance payments	4,768,466.00	4,369
III. Financial assets			2. Other accruals	15,775,662.53	19,283
1. Shares in affiliated companies	62,851,908.45	61,462		20,544,128.53	23,652
2. Loans to affiliated companies	44,191,722.17	38,731	<b>D. Accounts payable</b>		
3. Participating interests	17,549,659.73	17,188	1. Bonds	75,000,000.00	75,000
4. Securities	5,004,419.99	4,929	2. Bank loans and overdrafts	36,258,795.96	56,592
	129,597,710.34	122,310	3. Customer advances	76,573.00	158
	143,393,565.09	136,938	4. Trade payables	2,115,985.13	3,361
<b>B. Current assets</b>			5. Payables to affiliated companies	18,488,046.95	19,761
I. Inventories			6. Other liabilities, of which taxes EUR 899,982.22 (prior year: EUR 1,924k), of which social security payables EUR 774,634.56 (prior year: EUR 888k)	4,465,258.64	5,701
1. Merchandise	6,322,627.12	11,826		136,404,659.68	160,573
2. Services not yet invoiced	841,919.20	15,435			
3. Prepayments	314,827.30	5,020			
	7,479,373.62	32,281			
II. Receivables and other assets					
1. Trade receivables	7,373,314.82	3,813			
2. Receivables from affiliated companies	180,313,783.97	194,771			
3. Other assets	7,293,882.00	6,950			
	194,980,980.79	205,534			
III. Cash, bank balances	30,047,303.19	7,386			
	232,507,657.60	245,201			
<b>C. Prepaid expenses and deferred charges</b>	2,448,286.15	2,729			
	378,349,508.84	384,868		378,349,508.84	384,868

Contingent liabilities

198,134,006.11

120,638

## Income Statement for the Fiscal Year 2014/15

	2014/15	2013/14
	EUR	EUR '000
1. Net sales	144,671,160.77	177,255
2. Change in services not yet invoiced	-14,592,486.45	-9,811
3. Other operating income		
a) Income from the retirement of fixed assets excluding financial assets	1,159.75	0
b) Income from the reversal of accruals	814,771.49	2,100
c) Other	21,117,746.26	10,915
	21,933,677.50	13,015
4. Cost of materials and purchased services		
a) Cost of materials	-14,098,200.88	-20,617
b) Cost of purchased services	-34,102,387.18	-45,944
	-48,200,588.06	-66,561
5. Personnel expenses		
a) Wages	-205,325.27	-137
b) Salaries	-32,554,492.91	-33,319
c) Expenses for severance payments and contributions to staff provision funds	-1,587,822.20	-776
d) Expenses for pensions	-66,000.00	-84
e) Expenses for statutory social security, payroll-relates taxes and mandatory contributions	-8,678,578.60	-8,632
f) Other social benefits	-284,655.18	-254
	-43,376,874.16	-43,202
6. Depreciation and amortization of fixed intangible and tangible assets	-1,803,335.69	-2,190
7. Other operating expenses		
a) Taxes not included in line 17	-917,815.96	-1,120
b) Other	-39,949,559.56	-46,754
	-40,867,375.52	-47,874
<b>8. Subtotal of lines 1 to 7 (Operating result)</b>	<b>17,764,178.39</b>	<b>20,632</b>
9. Income from participating interests, of which from affiliated companies EUR 7,308,030.55 (prior year: EUR 6,980k)	7,308,030.55	6,980
10. Income from other long-term securities	0.00	5
11. Other interest and similar income, of which from affiliated companies EUR 5,626,963.73 (prior year: EUR 5,155k)	5,643,211.69	5,248
12. Income from the retirement and write-up of fixed financial assets	75,933.64	419
13. Expenses on fixed financial assets, of which	-893,493.79	0
a) Amounts written off EUR 893,493.79 (prior year: EUR 0k)		
b) Relating to affiliated companies EUR 893,493.79 (prior year: EUR 0k)		
14. Interest and similar expenses, of which relating to affiliated companies EUR 72,639.33 (prior year: EUR 46k)	-4,092,954.33	-4,221
<b>15. Subtotal of lines 9 to 14 (Financial result)</b>	<b>8,040,727.76</b>	<b>8,431</b>
<b>16. Net operating income</b>	<b>25,804,906.15</b>	<b>29,063</b>
17. Taxes on income, thereof recharged to group parent EUR 4,689,241.73 (prior year: EUR 5,280k)	-4,970,625.25	-5,282
<b>18. Net income for the year</b>	<b>20,834,280.90</b>	<b>23,781</b>
19. Prior period unappropriated retained earnings brought forward	69,878,414.51	46,097
<b>20. Unappropriated retained earnings</b>	<b>90,712,695.41</b>	<b>69,878</b>

## Notes to the financial statements for fiscal year 2014/15

### A. Accounting and valuation methods

#### 1. General principles

The financial statements as of 31 March 2015 have been prepared in accordance with the financial reporting requirements of the Austrian Commercial Code (UGB) as amended.

The financial statements, prepared under Austrian generally accepted accounting principles, present a true and fair view of the assets and liabilities, the financial situation of the Company, as well as its results of operations.

Accounting and valuation methods are based on generally accepted accounting principles. Section 201 (2) UGB was adhered to, as were the provisions on classification and valuation of balance sheet and income statement items under Sections 195 to 211 and 222 to 235 UGB. The income statement was prepared in accordance with the total expenditure format.

#### 2. Fixed assets

Purchased **intangible assets** and **tangible assets** are valued at acquisition or production cost less scheduled straight-line amortization/depreciation charged according to the estimated useful life of the assets.

**Low-value fixed assets** with individual acquisition costs of less than EUR 400 were fully written off in the year of acquisition or production.

#### Intangible assets

Acquired IT software is amortized based on a useful life of between four to eight years.

### **Tangible assets**

Tangible assets were depreciated on a straight-line basis over the following useful lives:

	Years
Investments in leasehold buildings	2 - 12
Technical equipment and machinery	2 - 5
Other equipment, factory and office equipment	2 - 15

No unscheduled depreciation was charged in the fiscal year.

Additions to fixed assets are depreciated according to the date of their initial use.

### **Financial assets**

Financial assets are stated at acquisition costs or the lower market values at the balance sheet date. Write-downs / write-ups are made only in case a diminution / increase in value is expected to be permanent.

### **3. Foreign currency receivables and payables**

Foreign currency receivables are stated using the exchange rate at the date of the transaction or the lower bank buying rate at the balance sheet date.

Foreign currency payables are stated using the exchange rate at the date of the transaction or the higher bank selling rate at the balance sheet date.

### **4. Current assets**

Inventories and receivables were stated in accordance with the strict lower of cost or market principle.

#### **Inventories**

The stocks of purchased goods, recorded by means of electronic data processing, were stated using the moving average price method. Inventories denominated in foreign currencies were stated using the exchange rate at the date of acquisition. Where required, write-downs were made to the lower replacement costs.

A proportional deduction from acquisition or production cost was made for goods with diminished usability or marketability, which was derived from the respective inventory turnover ratio. In case of long-term contracts, no administrative and selling overheads were capitalized (option provided by Section 206 (3) UGB), directly attributable finance cost was capitalized depending on the project. At the balance sheet date, there are no services not yet invoiced for which finance cost was capitalized.

**Receivables**

Receivables were stated at nominal values. Identifiable risks were considered in the valuation of the individual receivables by write-offs. No-interest or low-interest receivables were discounted.

**5. Accruals**

The accruals were set up in accordance with the principle of prudence at the estimated amounts.

The accruals for severance payments and anniversary bonuses were calculated in accordance with IAS 19 using the projected unit credit method.

A discount rate of 2.1% (prior year: 3.6%) was used for the calculation of entitlements, and a percentage of 2.0% (prior year: 2.0%) was assumed for salary increases. Furthermore, the calculation was based on the earliest possible retirement age in accordance with the transitional statutory provisions and the mortality tables Pagler & Pagler AVÖ 2008-P (prior year: AVÖ 2008-P). Staff turnover rates were determined based on the period of service.

**6. Accounts payable**

In accordance with the principle of prudence, accounts payable were valued at the amount repayable.



## B. Comments on balance sheet items

## Assets

## Fixed assets

## Movements in fixed assets:

	Acquisition/Production cost				Balance 31/3/2015 EUR	Accumulated amortization/ depreciation EUR	Net book value		Amortization/ depreciation current year EUR	Write-ups of current fiscal year EUR
	Balance 1/4/2014 EUR	Additions EUR	Disposals EUR	Transfers EUR			Balance 31/3/2015 EUR	Balance 31/3/2014 EUR		
<b>I. Intangible assets</b>										
1. Industrial property and similar rights and assets, and licenses in such rights and assets	10,834,450.21	138,511.03	169,009.68	106,811.00	10,910,762.56	8,540,094.60	2,370,667.96	2,727,194.64	600,634.51	0.00
2. Prepayments and construction in process	6,386,723.00	498,719.94	0.00	0.00	6,885,442.94	0.00	6,885,442.94	6,386,723.00	0.00	0.00
	17,221,173.21	637,230.97	169,009.68	106,811.00	17,796,205.50	8,540,094.60	9,256,110.90	9,113,917.64	600,634.51	0.00
<b>II. Tangible assets</b>										
1. Investments in leasehold buildings	4,972,919.80	49,219.22	0.00	0.00	5,022,139.02	2,804,479.11	2,217,659.91	2,647,260.31	478,819.62	0.00
2. Technical equipment and machinery	2,221,346.22	14,238.89	863.40	0.00	2,234,721.71	1,832,134.19	402,587.52	610,912.16	222,563.53	0.00
3. Other equipment, factory and office equipment	6,200,019.88	276,786.58	142,393.79	11,889.46	6,346,302.13	4,426,805.71	1,919,496.42	2,137,306.51	501,318.03	0.00
4. Prepayments and construction in process	118,700.46	0.00	0.00	-118,700.46	0.00	0.00	0.00	118,700.46	0.00	0.00
	13,512,986.36	340,244.69	143,257.19	-106,811.00	13,603,162.86	9,063,419.01	4,539,743.85	5,514,179.44	1,202,701.18	0.00
<b>III. Financial assets</b>										
1. Shares in affiliated companies	68,477,482.29	2,283,178.44	0.00	0.00	70,760,660.73	7,908,752.28	62,851,908.45	61,462,223.80	893,493.79	0.00
2. Loans to affiliated companies	38,730,779.60	5,460,942.57	0.00	0.00	44,191,722.17	0.00	44,191,722.17	38,730,779.60	0.00	0.00
3. Participating interests	17,188,008.58	361,651.15	0.00	0.00	17,549,659.73	0.00	17,549,659.73	17,188,008.58	0.00	0.00
4. Securities	5,004,419.99	0.00	0.00	0.00	5,004,419.99	0.00	5,004,419.99	4,928,486.35	0.00	75,933.64
	129,400,690.46	8,105,772.16	0.00	0.00	137,506,462.62	7,908,752.28	129,597,710.34	122,309,498.33	893,493.79	75,933.64
	160,134,850.03	9,083,247.82	312,266.87	0.00	168,905,830.98	25,512,265.89	143,393,565.09	136,937,595.41	2,696,829.48	75,933.64

**Financial obligations** of the Company from the use of tangible assets not recognized in the balance sheet amount to:

	In the following fiscal year		In the next 5 fiscal years	
	EUR	Prior year EUR '000	EUR	Prior year EUR '000
Obligations from rental and leasing agreements	6,023,543.04	6,949	19,219,464.69	20,067

### Shares in affiliated companies and shares in associates

#### Supplementary disclosures pursuant to Section 238 No. 2 UGB

Figures as of 31 March 2015	Share	Shareholders' equity	Result of fiscal year	FN
	%	EUR '000	EUR '000	
<b>a) Shares in affiliated companies</b>				
Kapsch TrafficCom AB, Jönköping, Sweden	100	15,675	5,405	1)
Kapsch TrafficCom Argentina S.A., Buenos Aires, Argentina	95	3,029	738	1)
Kapsch Components GmbH & Co KG, Vienna	100	6,195	-96	1)
Kapsch Components GmbH, Vienna	100	103	6	1)
Kapsch TrafficCom B.V., Amsterdam, Netherlands	100	46,954	-26	1)
Kapsch Telematic Services GmbH, Vienna	93	10,774	10,723	1)
Kapsch TrafficCom Construction & Realization spol. s r.o., Prague, Czech Republic	99	1,015	391	1)
Kapsch TrafficCom S.r.l., Milan, Italy	100	234	80	1)
Kapsch Telematic Technologies Bulgaria EAD, Sofia, Bulgaria	100	103	11	3)
Kapsch TrafficCom Ltd., Manchester, Great Britain	100	871	276	1)
ArtiBrain Software Entwicklungsgesellschaft mbH, Vienna	100	46	-1	1)
Kapsch TrafficCom Russia OOO, Moscow, Russia	100	1,300	-860	3)
Kapsch TrafficCom d.o.o., Ljubljana, Slovenia	100	45	5	1)
Kapsch TrafficCom France SAS, Paris, France	30.19	129	44	1)
Electronic Toll Collection (PTY) Ltd., Centurion, South Africa	25	-12,733	1,393	1)
Kapsch TrafficCom South Africa Holding (Pty) Ltd., Cape Town, South Africa	100	8,201	136	1)
Kapsch TrafficCom Kazakhstan LLC, Astana, Kazakhstan	100	84	32	3)
KTS Beteiligungs GmbH (formerly Jibesoev GmbH), Vienna	100	598	454	1)
Transport Telematic Systems LLC, Abu Dhabi, United Arab Emirates	-	67	12	2)
Kapsch Telematic Services IOOO, Minsk, Belarus	99	-9,880	-151	3)
Kapsch TrafficCom KGZ, Bischkek, Kyrgyzstan	100	16	6	3)
Kapsch TrafficCom Lietuva, Vilnius, Lithuania	51	11	-3	3)
<b>b) Shares in associates</b>				
Q-Free ASA, Trondheim, Norway	19.48	48,711	-2,321	3)
GLONASS tolling systems OOO, Moscow, Russia	20	0	0	4)

1) Figures as of 31 March 2015

2) The protection-of-interest clause pursuant to Section 241 (2) UGB is used.

3) Figures as of 31 December 2014

4) No financial statements have been prepared since the company was established.

In connection with the acquisition of 3% of the shares in Kapsch Telematic Services GmbH, Vienna, an outstanding variable purchase price component exists that depends on the earnings before interest and taxes (EBIT) of the KTS Group, net of non-controlling interests, of the financial years 2015-2018. This outstanding component amounts to a maximum of EUR 3.5 million (due for payment in July 2018 at the latest).

### Loans

Loans to affiliated companies have a residual term of more than one year.

### Current assets

#### Inventories

Prepayments in the amount of EUR 285,891.31 (prior year: EUR 4,950k) relate to prepayments made to affiliated companies.

#### Maturity of receivables

	31/3/2015		31/3/2014	
	Total	of which with a remaining maturity > 1 year	Total	of which with a remaining maturity > 1 year
	EUR	EUR	EUR	EUR
1. Trade receivables	7,373,314.82	0.00	3,813,619.28	0.00
2. Receivables from affiliated companies	180,313,783.97	81,276,047.71	194,771,041.29	82,160,809.18
3. Other assets	7,293,882.00	0.00	6,949,722.66	0.00
	194,980,980.79	81,276,047.71	205,534,383.23	82,160,809.18

Receivables from affiliated companies pertain to trade receivables in the amount of EUR 103,943,581.90 (prior year: EUR 100,731k), loan receivables in the amount of EUR 70,041,328.50 (prior year: EUR 87,917k) and dividend receivables in the amount of EUR 6,328,873.57 (prior year: EUR 6,123k).

Other assets mainly include research bonuses, receivables from fiscal authorities, accrued receivables and other assets.

Other assets include income in the amount of EUR 7,124,590.00 (prior year: EUR 6,795k) that will affect cash flow only after the balance sheet date.

## Shareholders' equity and liabilities

### Investment grants

Kapsch TrafficCom AG, Vienna, received an investment grant amounting to EUR 750,000.00 from the lessor for the adaptation of the new location at Euro Plaza. The grant is related to the following items of fixed assets:

	Balance 1/4/2014	Usage	Balance 31/3/2015
	EUR	EUR	EUR
Leasehold improvements	364,705.89	76,680.67	288,025.22

### Accruals

Other accruals include the following items:

	31/3/2015 EUR	31/3/2014 EUR '000
Invoices not yet received and outstanding project costs	9,371,249.57	11,513
Personnel accruals (including vacation accruals of EUR 2,327,990.43; prior year: EUR 2,867k)	4,307,975.04	5,153
Warranties and liabilities for construction flaws, as well as production and system defects	367,153.92	473
Sundry accruals	1,729,284.00	2,143
	<u>15,775,662.53</u>	<u>19,282</u>

## Accounts payable

### Maturity of payables

	31/3/2015			31/3/2014		
	Total	remaining maturity < 1 year	remaining maturity > 1 year	Total	remaining maturity < 1 year	remaining maturity > 1 year
	EUR	EUR	EUR	EUR	EUR	EUR
1. Bonds	75,000,000.00	0.00	75,000,000.00	75,000,000.00	0.00	75,000,000.00
2. Bank loans and overdrafts	36,258,795.96	21,758,795.98	14,499,999.98	56,592,129.24	21,758,795.92	34,833,333.32
3. Customer advances	76,573.00	76,573.00	0.00	157,989.84	157,989.84	0.00
4. Trade payables	2,115,985.13	2,115,985.13	0.00	3,360,645.67	3,360,645.67	0.00
5. Payables to affiliated companies	18,488,046.95	18,488,046.95	0.00	19,761,322.42	19,761,322.42	0.00
6. Other liabilities	4,465,258.64	4,465,258.64	0.00	5,700,829.86	5,700,829.86	0.00
	136,404,659.68	46,904,659.70	89,499,999.98	160,572,917.03	50,739,583.71	109,833,333.32

There are no accounts payable with a remaining maturity of more than 5 years.

In November 2010, Kapsch TrafficCom AG issued a corporate bond with a volume of EUR 75,000,000.00, a maturity of 7 years and a fixed coupon of 4.25%. In May 2015, the bond was repaid early in a nominal value of EUR 4,182,000.00.

Payables to affiliated companies pertain to trade payables with the exception of tax compensation in the amount of EUR 5,213,709.03 (prior year: EUR 5,924k) and a loan in the amount of EUR 3,132,444.26 (prior year: EUR 3,534k).

Other liabilities include expenses in the amount of EUR 3,551,352.42 (prior year: EUR 3,722k) that will affect cash flow only after the balance sheet date.

### Collateral securities

The export promotion loan recognized in the amount of EUR 1,425,462.56 is secured by bill of exchange.

In connection with the project financing for Belarus with an outstanding loan in the amount of EUR 34.8 million as of 31 March 2015, the Company received a guarantee by aval from Oesterreichische Kontrollbank Aktiengesellschaft (OeKB) as well as a participation guarantee G4 from OeKB. Claims arising from the participation guarantee G4 were assigned as security to the lending banks.

**Contingent liabilities**

	31/3/2015 EUR	31/3/2014 EUR
Assumption of liabilities on behalf of subsidiaries	51,988,284.43	49,707,255.16
Bank guarantees for the performance of contracts relating to major projects	38,747,373.41	37,614,753.20
Payment guarantees	548,342.81	1,235,962.98
Project performance guarantees for subsidiaries	106,243,413.76	31,533,541.02
Other guarantees (security deposits, bid bonds and sureties)	606,591.70	546,094.32
	<u>198,134,006.11</u>	<u>120,637,606.68</u>

In addition, Kapsch TrafficCom AG, Vienna, provided performance bonds for export transactions and projects of Kapsch TrafficCom AB, Jönköping, Sweden, in a contract value of EUR 43.2 million (prior year: EUR 44.8 million).

A letter of subordination exists vis-à-vis KapschTrafficCom AB, Jönköping, Sweden, relating to loan and dividend receivables in the amount of EUR 8,635,064.75.

A letter of subordination exists vis-à-vis Electronic Toll Collection (PTY) Ltd., Centurion, South Africa, relating to loan and trade receivables in the amount of EUR 3,183,307.15.

**Derivative financial instruments**

At the balance sheet date, the Company has no derivative financial instruments.

**C. Comments on income statement items****Breakdown of net sales**

<b>By activity:</b>	2014/15 EUR	2013/14 EUR '000
Road Solution Projects	39,787,776.00	82,880
Services, System Extensions, Components Sales	104,883,384.77	94,375
	<u>144,671,160.77</u>	<u>177,255</u>
<b>By region:</b>	2014/15 EUR	2013/14 EUR '000
Domestic	26,940,353.74	30,114
European Union	61,257,739.92	55,359
Foreign	56,473,067.11	91,782
	<u>144,671,160.77</u>	<u>177,255</u>

**Expenses for severance payments and contributions to staff provision funds** include the following:

	2014/15 EUR	2013/14 EUR '000
Expenses for severance payments	1,188,447.70	374
Contributions to staff provision funds	<u>399,374.50</u>	<u>402</u>
	<u><u>1,587,822.20</u></u>	<u><u>776</u></u>

#### **Expenses for the auditor**

Expenses for the auditor amount to EUR 199,265.00 (prior year: EUR 147k) and are broken down as follows:

	2014/15 EUR	2013/14 EUR '000
Audit of the financial statements	52,650.00	53
Other assurance services	67,926.00	60
Other services	<u>78,689.00</u>	<u>34</u>
	<u><u>199,265.00</u></u>	<u><u>147</u></u>

#### **Taxes on income**

- a) The option to capitalize deferred tax assets on temporary differences between the business result and tax result was not used. The capitalizable amount pursuant to Section 198 (10) UGB amounts to EUR 1,430,203.69 (prior year: EUR 1,407k), and EUR 266,923.82 (prior year: EUR 277k) thereof is classified as short-term.
- b) The Company is member of a tax group, parent of the tax group is KAPSCH-Group Beteiligungs GmbH, Vienna. In accordance with Section 9 (1) KStG (Austrian Corporate Income Tax Act), the tax result of the respective group member is allocated to the tax result of the holding company or the group parent in the respective fiscal year. Pursuant to Section 7 (2) KStG, the income is determined at the group parent based on the consolidated result of the group and taxed. Tax is allocated using the stand-alone method.

## **D. Other disclosures**

### **Disclosures on share capital**

The registered share capital of the Company amounts to EUR 13,000,000.00. The share capital is fully paid in. The total number of shares issued is 13,000,000. The shares are no-par value bearer shares.

### **Authorized capital**

The authorized capital amounts to EUR 0 as of 31 March 2015 (prior year: EUR 0k).

### **Group relations**

The Company is a 63.13% subsidiary of KAPSCH-Group Beteiligungs GmbH, Vienna, and thus is related to its shareholder and its affiliated companies as a group company.

DATA X HandelsgmbH, Vienna, prepares the consolidated financial statements for the largest group of companies. These consolidated financial statements are deposited at the Commercial Court Vienna.

The Company prepares the consolidated financial statements for the smallest group of companies.

With regard to the disclosure on the legal and economic relations with affiliated companies, the protection-of-interest clause pursuant to Section 241 (3) UGB was used.

### **Disclosures on board members and staff**

The average number of staff during fiscal year 2014/15 was 552, including 525 salaried employees and 27 waged workers (prior year: 523 salaried employees, 23 waged workers).

In fiscal year 2014/15, total remuneration of the management board amounted to EUR 1,114,401.23 (prior year: EUR 1,398k), expenses for severance payments and pensions for managing directors amounted to EUR 24,238.00 (prior year: EUR 84k).

With regard to supervisory board members, remuneration (including travel expenses) in the amount of EUR 46,000.00 (prior year: EUR 20k) was recognized as expenses.



The following persons served on the management and supervisory board:

**Management Board**

Georg Kapsch (Chairman)  
André Laux

**Supervisory Board**

Franz Semmernegg (Chairman)  
Kari Kapsch (Deputy Chairman)  
Sabine Kauper  
Harald Sommerer

delegated by the Works Council:

Christian Windisch  
Claudia Rudolf-Misch (until 19 November 2014)  
Manfred Schmid (from 20 November 2014 to 10 March 2015)  
Martin Gartler (since 11 March 2015)

Vienna, 1 June 2015

The Management Board:



signed:

Georg Kapsch



signed:

André Laux

We draw attention to the fact that the English translation of this auditor's report according to Section 274 of the Austrian Commercial Code (UGB) is presented for the convenience of the reader only and that the German wording is the only legally binding version.

## Auditor's Report

### Report on the Financial Statements

We have audited the accompanying financial statements, including the accounting system, of Kapsch TrafficCom AG, Vienna, for the fiscal year from 1 April 2014 to 31 March 2015. These financial statements comprise the balance sheet as of 31 March 2015, the income statement for the fiscal year ended 31 March 2015, and the notes.

#### *Management's Responsibility for the Financial Statements and for the Accounting System*

The Company's management is responsible for the accounting system and for the preparation and fair presentation of the financial statements in accordance with Austrian Generally Accepted Accounting Principles. This responsibility includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; making accounting estimates that are reasonable in the circumstances.

#### *Auditor's Responsibility and Description of Type and Scope of the Statutory Audit*

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with laws and regulations applicable in Austria and Austrian Standards on Auditing. Those standards require that we comply with professional guidelines and that we plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Company's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a reasonable basis for our audit opinion.

*Opinion*

Our audit did not give rise to any objections. In our opinion, which is based on the results of our audit, the financial statements comply with legal requirements and give a true and fair view of the financial position of the Company as of 31 March 2015 and of its financial performance for the fiscal year from 1 April 2014 to 31 March 2015 in accordance with Austrian Generally Accepted Accounting Principles.

**Comments on the Management Report**

Pursuant to statutory provisions, the management report is to be audited as to whether it is consistent with the financial statements and as to whether the other disclosures are not misleading with respect to the Company's position. The auditor's report also has to contain a statement as to whether the management report is consistent with the financial statements and whether the disclosures pursuant to Section 243a UGB (Austrian Commercial Code) are appropriate.

In our opinion, the management report is consistent with the financial statements. The disclosures pursuant to Section 243a UGB (Austrian Commercial Code) are appropriate.

Vienna, 1 June 2015

PwC Wirtschaftsprüfung GmbH



signed:

Peter Pessenlehner  
Austrian Certified Public Accountant

Disclosure, publication and duplication of the financial statements together with the auditor's report according to Section 281 (2) UGB in a form not in accordance with statutory requirements and differing from the version audited by us is not permitted. Reference to our audit may not be made without prior written permission from us.

**Kapsch TrafficCom** is a provider of intelligent transportation systems (ITS) in the solution segments of road user charging, urban access and parking, traffic management, road safety enforcement, commercial vehicle operations, electronic vehicle registration and V2X cooperative systems. With end-to-end solutions, Kapsch TrafficCom covers the entire value creation chain of its customers as a one-stop shop, from components and design to the installation and operation of systems. The core business is to design, build and operate electronic toll collection and traffic management systems. References in 44 countries on all continents make Kapsch TrafficCom a recognized ITS provider worldwide. As part of the Kapsch Group, a family-owned Austrian technology group founded in 1892, Kapsch TrafficCom, headquartered in Vienna, Austria, has subsidiaries and offices in 33 countries, has been listed on the Vienna Stock Exchange (KTCG) since 2007, and generated with more than 3,500 employees revenues of EUR 456 million in fiscal year 2014/15.

**Kapsch TrafficCom AG** | Am Europlatz 2 | 1120 Vienna | Austria | [www.kapschtraffic.com](http://www.kapschtraffic.com)

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**ATTACHMENT E**

**ACKNOWLEDGMENT OF ADDENDA**

**GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT**

**ACKNOWLEDGMENT OF ADDENDA**

The undersigned Proposer acknowledges receipt of the following addenda, if issued, to the RFP Documents. If none received, write "None Received."

Addendum No. 1, dated October 27, 2016.

Addendum No. 2, dated November 18, 2016.

Addendum No. 3, dated November 22, 2016.

Addendum No. 4, dated November 30, 2016.

Date: 12/9/16

Firm: Kapsch TrafficCom IVHS Inc.

Print Name: Christopher F. Murray / Michael Hofer

Signature:  / 

Title: President & CEO / CFO



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
12/08/2016

**THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.**

**IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).**

<b>PRODUCER</b> MARSH USA, INC. 99 HIGH STREET BOSTON, MA 02110 Attn: Boston.certrequest@Marsh.com Fax: 212-948-4377  116924947-all-Prof-16-17                      GAWU	<b>CONTACT NAME:</b> <b>PHONE (A/C, No, Ext):</b> <b>FAX (A/C, No):</b> <b>E-MAIL ADDRESS:</b>	
	<b>INSURER(S) AFFORDING COVERAGE</b> <b>NAIC #</b> <b>INSURER A :</b> Federal Insurance Company                      20281 <b>INSURER B :</b> Great Northern Insurance Company                      20303 <b>INSURER C :</b> Chubb Indemnity Insurance Company                      12777 <b>INSURER D :</b> ACE American Insurance Company                      22667 <b>INSURER E :</b> <b>INSURER F :</b>	

**COVERAGES**                      **CERTIFICATE NUMBER:** NYC-008687620-04                      **REVISION NUMBER:** 7

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> <b>COMMERCIAL GENERAL LIABILITY</b> <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			9949-16-74	11/30/2016	11/30/2017	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
B	<input checked="" type="checkbox"/> <b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS			7356-51-01	11/30/2016	11/30/2017	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> <b>UMBRELLA LIAB</b> <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> <b>EXCESS LIAB</b> <input type="checkbox"/> CLAIMS-MADE DED    RETENTION \$			7983-64-37	11/30/2016	11/30/2017	EACH OCCURRENCE \$ 4,000,000 AGGREGATE \$ 4,000,000 \$
C	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input checked="" type="checkbox"/> N	N/A	(17)7175-13-28	11/30/2016	11/30/2017	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
D	Professional / Cyber Liability			EON G25604635 001	11/30/2016	11/30/2017	5,000,000

**DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)**

Golden Gate Bridge, Highway and Transportation District, and its respective directors, officers, employees, and contract related agents while acting in such capacity, and their successors or assignees, as they now or as they may hereafter be constituted, singly, jointly, or severally are This insurance is primary and non-contributory over any existing insurance and limited to liability arising out of the operations of the named insured subject to policy terms and conditions.

**CERTIFICATE HOLDER**                      **CANCELLATION**

Janet S. Tarantino, Secretary of the District Golden Gate Bridge, Highway & Transportation District P.O. Box 9000, Presidio Station San Francisco, CA 94129-0601	<b>SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.</b>  <b>AUTHORIZED REPRESENTATIVE</b> of Marsh USA Inc.  Elizabeth Stapleton <i>Elizabeth Stapleton</i>
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ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			2nd Quarter			3rd Quarter			
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	<b>GGB- Golden Gate Bridge</b>																
2	<b>Major Phase Milestones</b>	1769 days	Wed 3/1/17	Thu 12/28/23		0 days	Yes										
3	Phase I Definition and Business Rules	32 days	Wed 3/1/17	Thu 4/13/17		0 days	Yes										
4	Notice to Proceed (NTP)	0 days	Wed 3/1/17	Wed 3/1/17		0 days	Yes										
5	Project Initiation	0 days	Fri 3/31/17	Fri 3/31/17	4FS+23 days	0 days	Yes										
6	Master Project Schedule	0 days	Fri 3/31/17	Fri 3/31/17	61	1746 d...	No										
7	Requirements Traceability Matrix	0 days	Thu 4/13/17	Thu 4/13/17	5FS+9 days	0 days	Yes										
8	Gantry Requirements Plan	0 days	Thu 4/13/17	Thu 4/13/17	7SS	1252 d...	No										
9	<b>Phase II System Design</b>	1728 days	Fri 4/28/17	Thu 12/28/23		0 days	Yes										
10	Preliminary Design	1 day	Fri 4/28/17	Fri 4/28/17	8FS+9 days	1252 d...	No										
11	Preliminary System Design Documents	1 day	Fri 4/28/17	Fri 4/28/17		0 days	Yes										
12	Detailed Design	20 days	Thu 6/29/17	Fri 7/28/17		0 days	Yes										
13	Detailed System Design Documents	0 days	Thu 6/29/17	Thu 6/29/17	11FS+40 days,7	1252 d...	No										
14	Gantry Detail Drawings	0 days	Thu 6/29/17	Thu 6/29/17	7,8,11FS+40 days	1687 d...	No										
15	RCS ICID	0 days	Thu 6/29/17	Thu 6/29/17	7,11FS+40 days	1687 d...	No										
16	DSDD Workshops	0 days	Fri 7/14/17	Fri 7/14/17	13FS+9 days	1252 d...	No										
17	DSDD Workshops Approved	1 day	Fri 7/28/17	Fri 7/28/17	16FS+10 days	1252 d...	No										
18	<b>Final Design</b>	21 days	Mon 8/28/17	Wed 9/27/17		0 days	Yes										
19	Final Design Documents	0 days	Mon 8/28/17	Mon 8/28/17	17FS+20 days	1252 d...	No										
20	Client Workshop	0 days	Tue 9/12/17	Tue 9/12/17	19FS+10 days	1252 d...	No										
21	FSDD Approval	0 days	Wed 9/27/17	Wed 9/27/17	20FS+11 days	1252 d...	No										
22	<b>Phase III System Development</b>	0 days	Tue 7/24/18	Tue 7/24/18		1396 d...	No										
23	CSC Integration Test	0 days	Tue 7/24/18	Tue 7/24/18	208,7	1416 d...	No										
24	Factory Acceptance Test	0 days	Tue 7/24/18	Tue 7/24/18	229,7	1416 d...	No										
25	Accepted FAT and CIT Reports	0 days	Tue 7/24/18	Tue 7/24/18	208,229	1396 d...	No										
26	<b>Phase IV Installation</b>	50 days	Thu 12/7/17	Tue 2/20/18		1526 d...	No										
27	Installation Plan	0 days	Thu 12/7/17	Thu 12/7/17	247,7	1576 d...	No										
28	System Maintenance Planning	0 days	Tue 2/20/18	Tue 2/20/18	256,7	1526 d...	No										
29	Gantry Equipment Field Test	0 days	Tue 2/20/18	Tue 2/20/18	265,7	1526 d...	No										
30	<b>Phase V Transition</b>	37 days	Wed 11/7/18	Fri 12/28/18		1304 d...	No										
31	Data Migration Planning	0 days	Wed 11/7/18	Wed 11/7/18	25	1321 d...	No										
32	Business Continuity Planning	0 days	Tue 11/13/18	Tue 11/13/18	31FS+5 days	1321 d...	No										
33	Training Materials	0 days	Tue 11/20/18	Tue 11/20/18	32FS+5 days	1321 d...	No										
34	Training Courses	0 days	Wed 11/28/18	Wed 11/28/18	33	1316 d...	No										
35	Production Readiness Test	0 days	Tue 12/4/18	Tue 12/4/18	34FS+5 days	1316 d...	No										
36	Cutover Plan	0 days	Tue 12/11/18	Tue 12/11/18	35FS+5 days	1316 d...	No										
37	Go Live	0 days	Fri 12/28/18	Fri 12/28/18	35	1304 d...	No										
38	<b>Phase VI System Acceptance</b>	150 days	Wed 11/28/18	Wed 6/26/19		0 days	Yes										
39	As-Built Documentation	0 days	Tue 2/26/19	Tue 2/26/19	7FS+475 days	0 days	Yes										
40	System Acceptance Test Plan	0 days	Wed 11/28/18	Wed 11/28/18	7FS+411 days	1326 d...	No										

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Task: █ Project Summary    █ External Tasks    █ External Milestone    █ Inactive Task

Split: █ Manual Summary Rollup    █ Manual Summary    █ Start-only    █ Finish-only

Milestone: ◆ Inactive Milestone    ◆ Inactive Summary    ◆ Manual Task    ◆ Duration-only

Summary: █ Deadline    █ Progress



ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			2nd Quarter			3rd Quarter				
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
41	Accepted SAT Report	0 days	Wed 6/26/19	Wed 6/26/19	7, 39FS+86 days	0 days	Yes											
42	Phase VII Maintenance	0 days	Thu 12/28/23	Thu 12/28/23		0 days	Yes											
43	Completion of Maintenance Periods	0 days	Thu 12/28/23	Thu 12/28/23	41FS+1176 days	0 days	Yes											
44	<b>Design and Build</b>	1769 days	Wed 3/1/17	Thu 12/28/23		0 days	Yes											
45	Phase I Definition & Business Rules	75 days	Wed 3/1/17	Fri 6/16/17		1279 d...	No											
46	Contract Award	5 days	Wed 3/1/17	Tue 3/7/17		1737 d...	No											
47	Contract Award/NTP	0 days	Wed 3/1/17	Wed 3/1/17	4	1737 d...	No											
48	Partnering Dev Pre-Meeting	5 days	Wed 3/1/17	Tue 3/7/17	47	1737 d...	No											
49	Project Mobilization	10 days	Tue 3/7/17	Tue 3/21/17		1274 d...	No											
50	Project Mobilization Start	0 days	Tue 3/7/17	Tue 3/7/17	4FS+5 days	1274 d...	No											
51	Mobilize Project Team	0 days	Tue 3/14/17	Tue 3/14/17	50FS+5 days	1754 d...	No											
52	Conduct Project Kick-Off Meeting with Client	0 days	Tue 3/21/17	Tue 3/21/17	51FS+5 days	1754 d...	No											
53	Partnering Dev Kickoff Meeting	0 days	Tue 3/7/17	Tue 3/7/17	48	1764 d...	No											
54	Project Mobilization Complete	0 days	Tue 3/14/17	Tue 3/14/17	50FS+5 days	1709 d...	No											
55	Project Implementation Plan	23 days	Wed 3/1/17	Fri 3/31/17		1746 d...	No											
56	Master Project Schedule Start	0 days	Wed 3/1/17	Wed 3/1/17	47	1746 d...	No											
57	Kapsch Develop Master Project Schedule	13 days	Wed 3/1/17	Fri 3/17/17	56	1746 d...	No											
58	Kapsch Submit Master Project Schedule to GGB [Rev. 00]	0 days	Fri 3/17/17	Fri 3/17/17	57	1746 days	No											
59	GGB Reviews project Baseline Master Project Schedule and Sends Comments Back	5 days	Fri 3/17/17	Fri 3/24/17	58	1746 days	No											
60	GGB Reviews the Revised Master Project Schedule and Sends Approval to Kapsch	5 days	Fri 3/24/17	Fri 3/31/17	59	1746 days	No											
61	Master Project Schedule Complete	0 days	Fri 3/31/17	Fri 3/31/17	60	1746 d...	No											
62	Phase I Opening Document Delivery	70 days	Tue 3/7/17	Fri 6/16/17		1694 d...	No											
63	Quality Assurance Plan Document Start	50 days	Tue 3/7/17	Wed 5/17/17		1714 d...	No											
64	Kapsch Develop Draft Document	20 days	Tue 3/7/17	Tue 4/4/17	64	1714 d...	No											
65	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Tue 4/4/17	Tue 4/4/17	65	1714 days	No											
66	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 4/4/17	Wed 4/19/17	66	1714 days	No											
67	Kapsch Address Received Comments and Revise Draft Document	10 days	Wed 4/19/17	Wed 5/3/17	67	1714 days	No											
68	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Wed 5/3/17	Wed 5/3/17	68	1714 days	No											
69	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Wed 5/3/17	Wed 5/17/17	69	1714 days	No											
70	Document Complete	0 days	Wed 5/17/17	Wed 5/17/17	70	1714 d...	No											
71	<b>Program Management Plan</b>	50 days	Tue 3/7/17	Wed 5/17/17		1694 d...	No											
72	Document Start	0 days	Tue 3/7/17	Tue 3/7/17	50	1694 d...	No											

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Manual Summary Rollup: Manual Summary, Start-only, Finish-only

Manual Summary Rollup: Inactive Milestone, Inactive Summary, Manual Task, Duration-only

Manual Summary Rollup: Deadline, Progress

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ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack Critical	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
74	Kapsch Develop Draft Document	20 days	Tue 3/7/17	Tue 4/4/17	73	1694 d...												
75	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Tue 4/4/17	Tue 4/4/17	74	1694 days												
76	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 4/4/17	Wed 4/19/17	75	1714 days												
77	Kapsch Address Received Comments and Revise Draft Document	10 days	Wed 4/19/17	Wed 5/3/17	76	1714 days												
78	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Wed 5/3/17	Wed 5/3/17	77	1714 days												
79	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Wed 5/3/17	Wed 5/17/17	78	1714 days												
80	Document Complete	0 days	Wed 5/17/17	Wed 5/17/17	79	1714 d...												
81	<b>System Responsibilities Matrix</b>	<b>50 days</b>	<b>Tue 4/4/17</b>	<b>Fri 6/16/17</b>		<b>1694 d...</b>												
82	Document Start	0 days	Tue 4/4/17	Tue 4/4/17	75	1694 d...												
83	Kapsch Develop Draft Document	20 days	Tue 4/4/17	Wed 5/3/17	82	1694 d...												
84	Kapsch Submits Draft Document to GGB[Rev. 00]	0 days	Wed 5/3/17	Wed 5/3/17	83	1694 days												
85	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Wed 5/3/17	Wed 5/17/17	84	1694 days												
86	Kapsch Address Received Comments and Revise Draft Document	10 days	Wed 5/17/17	Thu 6/1/17	85	1694 days												
87	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Thu 6/1/17	Thu 6/1/17	86	1694 days												
88	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Thu 6/1/17	Fri 6/16/17	87	1694 days												
89	Document Complete	0 days	Fri 6/16/17	Fri 6/16/17	88	1694 d...												
90	<b>Configuration Management Plan</b>	<b>50 days</b>	<b>Tue 3/14/17</b>	<b>Wed 5/24/17</b>		<b>1709 d...</b>												
91	Document Start	0 days	Tue 3/14/17	Tue 3/14/17	54	1709 d...												
92	Kapsch Develop Draft Document	20 days	Tue 3/14/17	Tue 4/11/17	91	1709 d...												
93	Kapsch Submits Draft Document to GGB[Rev. 00]	0 days	Tue 4/11/17	Tue 4/11/17	92	1709 days												
94	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 4/11/17	Wed 4/26/17	93	1709 days												
95	Kapsch Address Received Comments and Revise Draft Document	10 days	Wed 4/26/17	Wed 5/10/17	94	1709 days												
96	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Wed 5/10/17	Wed 5/10/17	95	1709 days												
97	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Wed 5/10/17	Wed 5/24/17	96	1709 days												
98	Document Complete	0 days	Wed 5/24/17	Wed 5/24/17	97	1709 d...												
99	<b>Security Plan</b>	<b>50 days</b>	<b>Tue 3/14/17</b>	<b>Wed 5/24/17</b>		<b>1709 d...</b>												
100	Document Start	0 days	Tue 3/14/17	Tue 3/14/17	54	1709 d...												

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Manual Summary Rollup: Manual Summary, Start-only, Finish-only

Inactive Milestone: Inactive Summary, Manual Task, Duration-only

Deadline: Progress

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ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			3rd Quarter			1st Quarter			3rd Quarter		
								Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar
101	Kapsch Develop Draft Document	20 days	Tue 3/14/17	Tue 4/11/17	100	1709 d...	No												
102	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Tue 4/11/17	Tue 4/11/17	101	1709 days	No												
103	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 4/11/17	Wed 4/26/17	102	1709 days	No												
104	Kapsch Address Received Comments and Revise Draft Document	10 days	Wed 4/26/17	Wed 5/10/17	103	1709 days	No												
105	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Wed 5/10/17	Wed 5/10/17	104	1709 days	No												
106	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Wed 5/10/17	Wed 5/24/17	105	1709 days	No												
107	Document Complete	0 days	Wed 5/24/17	Wed 5/24/17	106	1709 d...	No												
108	<b>System Requirements and Matrix</b>	<b>27 days</b>	<b>Tue 3/7/17</b>	<b>Thu 4/13/17</b>		<b>1737 d...</b>	<b>No</b>												
109	System Requirements Document and Traceability Matrix Start	0 days	Tue 3/7/17	Tue 3/7/17	48	1737 days	No												
110	Kapsch Develops Draft Document	5 days	Tue 3/7/17	Tue 3/14/17	109	1737 d...	No												
111	Initial Requirements Review Meeting	1 day	Wed 3/15/17	Wed 3/15/17	110	1737 d...	No												
112	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Wed 3/15/17	Wed 3/15/17	111	1737 days	No												
113	GGB Reviews Draft Document and Sends Comments Back to Kapsch	6 days	Wed 3/15/17	Thu 3/23/17	112	1737 days	No												
114	Kapsch Addresses Received Comments and Revise Draft Document	5 days	Thu 3/23/17	Thu 3/30/17	113	1737 days	No												
115	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Thu 3/30/17	Thu 3/30/17	114	1737 days	No												
116	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Thu 3/30/17	Thu 4/13/17	115	1737 days	No												
117	System Requirements Document and Traceability Matrix Complete	0 days	Thu 4/13/17	Thu 4/13/17	116,7FF	1737 days	No												
118	<b>Gantry Requirement Plan</b>	<b>27 days</b>	<b>Tue 3/7/17</b>	<b>Thu 4/13/17</b>		<b>1737 d...</b>	<b>No</b>												
119	Document Start	0 days	Tue 3/7/17	Tue 3/7/17	48	1738 d...	No												
120	Kapsch Develop Draft Document	6 days	Tue 3/7/17	Wed 3/15/17	119	1738 d...	No												
121	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Wed 3/15/17	Wed 3/15/17	120	1738 days	No												
122	GGB Reviews Draft Document and Sends Comments Back to Kapsch	5 days	Wed 3/15/17	Wed 3/22/17	121	1738 days	No												
123	Kapsch Address Received Comments and Revise Draft Document	5 days	Wed 3/22/17	Wed 3/29/17	122	1738 days	No												
124	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Wed 3/29/17	Wed 3/29/17	123	1738 days	No												
125	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Wed 3/29/17	Wed 4/12/17	124	1738 days	No												

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Task: [Task Icon] Split [Split Icon] Milestone [Milestone Icon] Summary [Summary Icon]

Project Summary [Project Summary Icon] External Tasks [External Tasks Icon] External Milestone [External Milestone Icon] Inactive Task [Inactive Task Icon]

Manual Summary Rollup [Manual Summary Rollup Icon] Manual Summary [Manual Summary Icon] Start-only [Start-only Icon] Finish-only [Finish-only Icon]

Deadline [Deadline Icon] Progress [Progress Icon]





ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			2nd Quarter			3rd Quarter					
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
178	Kapsch Address Received Comments and Revise Draft Document	10 days	Mon 6/12/17	Wed 6/28/17	177	1677	No												
179	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Wed 6/28/17	Wed 6/28/17	178	1677	No												
180	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Wed 6/28/17	Fri 7/14/17	179	1677	No												
181	Document Complete	0 days	Fri 7/14/17	Fri 7/14/17	180	1677 d...	No												
182	<b>Phase III System Development</b>	<b>210 days</b>	<b>Wed 9/27/17</b>	<b>Tue 7/24/18</b>		<b>1252 d...</b>	<b>No</b>												
183	<b>Software Development</b>	<b>140 days</b>	<b>Wed 9/27/17</b>	<b>Tue 4/17/18</b>		<b>1252 d...</b>	<b>No</b>												
184	SW Development Start	0 days	Wed 9/27/17	Wed 9/27/17	171	1252 d...	No												
185	SW Development Time Frame	140 days	Wed 9/27/17	Tue 4/17/18	184	1252 d...	No												
186	Data Migration Analysis, Design & Developm	140 days	Wed 9/27/17	Tue 4/17/18	184	1252 d...	No												
187	SW Development Complete	0 days	Tue 4/17/18	Tue 4/17/18	185,186	1252 d...	No												
188	<b>CSC Integration Plan (CIT)</b>	<b>50 days</b>	<b>Tue 4/17/18</b>	<b>Tue 6/26/18</b>		<b>1252 d...</b>	<b>No</b>												
189	Document Start	0 days	Tue 4/17/18	Tue 4/17/18	187	1252 d...	No												
190	Kapsch Develop Draft Document	20 days	Tue 4/17/18	Tue 5/15/18	189	1252 d...	No												
191	Kapsch Submits Draft Document to GGB [Rev.0	0 days	Tue 5/15/18	Tue 5/15/18	190	1252 d...	No												
192	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 5/15/18	Tue 5/29/18	191	1252	No												
193	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 5/29/18	Tue 6/12/18	192	1252	No												
194	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 6/12/18	Tue 6/12/18	193	1252	No												
195	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 6/12/18	Tue 6/26/18	194	1252	No												
196	Document Complete	0 days	Tue 6/26/18	Tue 6/26/18	195	1252 d...	No												
197	<b>CSC Integration Test</b>	<b>20 days</b>	<b>Tue 6/26/18</b>	<b>Tue 7/24/18</b>		<b>1396 d...</b>	<b>No</b>												
198	Test Start	0 days	Tue 6/26/18	Tue 6/26/18	196	1396 d...	No												
199	Conduct Internal Dry-Run Tests	3 days	Tue 6/26/18	Fri 6/29/18	198	1396 d...	No												
200	Continued Configuration and Tuning	1 day	Fri 6/29/18	Mon 7/2/18	199	1396 d...	No												
201	Network Connectivity Tests	1 day	Mon 7/2/18	Mon 7/3/18	200	1396 d...	No												
202	Debug, Reconfiguration, and Retest Failures	1 day	Tue 7/3/18	Wed 7/4/18	201	1396 d...	No												
203	Conduct Formal Dry-Run	3 days	Wed 7/4/18	Mon 7/9/18	202	1396 d...	No												
204	Test Readiness Review/Code Freeze	1 day	Mon 7/9/18	Tue 7/10/18	203	1396 d...	No												
205	Formal Readiness Test	3 days	Tue 7/10/18	Fri 7/13/18	204	1396 d...	No												
206	Re-Testing if Needed, Test Report Preparation and Submission	2 days	Fri 7/13/18	Tue 7/17/18	205	1396	No												
207	GGB Reviews and Approves Test Report	5 days	Wed 7/18/18	Tue 7/24/18	206	1396 d...	No												
208	Test Complete	0 days	Tue 7/24/18	Tue 7/24/18	207	1396 d...	No												
209	<b>FACTORY ACCEPTANCE TEST (FAT)</b>	<b>70 days</b>	<b>Tue 4/17/18</b>	<b>Tue 7/24/18</b>		<b>1252 d...</b>	<b>No</b>												
210	<b>FAT Plan and Scripts</b>	<b>50 days</b>	<b>Tue 4/17/18</b>	<b>Tue 6/26/18</b>		<b>1252 d...</b>	<b>No</b>												

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Manual Summary Rollup:  Manual Summary:  Start-only:  Finish-only:

Task:  Split:  Milestone:  Summary:

Inactive Milestone:  Inactive Summary:  Manual Task:  Duration-only:

Deadline:  Progress:

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ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			3rd Quarter			1st Quarter			3rd Quarter		
								Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar
211	Document Start	0 days	Tue 4/17/18	Tue 4/17/18	187	1252 d...	No												
212	Kapsch Develops Draft Document	20 days	Tue 4/17/18	Tue 5/15/18	211	1252 d...	No												
213	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Tue 5/15/18	Tue 5/15/18	212	1252 days	No												
214	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 5/15/18	Tue 5/29/18	213	1252 days	No												
215	Kapsch Addresses Received Comments and Revise Draft Document	10 days	Tue 5/29/18	Tue 6/12/18	214	1252 days	No												
216	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 6/12/18	Tue 6/12/18	215	1252 days	No												
217	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 6/12/18	Tue 6/26/18	216	1252 days	No												
218	Document Complete	0 days	Tue 6/26/18	Tue 6/26/18	217	1252 d...	No												
219	<b>Conduct FAT</b>	<b>20 days</b>	<b>Tue 6/26/18</b>	<b>Tue 7/24/18</b>		<b>1252 d...</b>	<b>No</b>												
220	Test Start	0 days	Tue 6/26/18	Tue 6/26/18	218,196	1252 d...	No												
221	Conduct Internal Dry-Run Tests	3 days	Tue 6/26/18	Fri 6/29/18	220	1252 d...	No												
222	Continued Configuration and Tuning	1 day	Fri 6/29/18	Mon 7/2/18	221	1252 d...	No												
223	Network Connectivity Tests	1 day	Mon 7/2/18	Tue 7/3/18	222	1252 d...	No												
224	Debug, Reconfiguration, and Retest Failure	1 day	Tue 7/3/18	Wed 7/4/18	223	1252 d...	No												
225	Conduct Formal Dry-Run	3 days	Wed 7/4/18	Mon 7/9/18	224	1252 d...	No												
226	Test Readiness Review/Code Freeze	1 day	Mon 7/9/18	Tue 7/10/18	225	1252 d...	No												
227	Formal Readiness Test	3 days	Tue 7/10/18	Fri 7/13/18	226	1252 d...	No												
228	Re-Testing if Needed, Test Report Preparation and Submission	2 days	Fri 7/13/18	Tue 7/17/18	227	1252 days	No												
229	GGB Reviews and Approves Test Report	5 days	Wed 7/18/18	Tue 7/24/18	228	1252 d...	No												
230	Test Complete	0 days	Wed 7/24/18	Tue 7/24/18	229	1252 d...	No												
231	<b>MATERIAL PROCUREMENT</b>	<b>100 days</b>	<b>Wed 9/27/17</b>	<b>Tue 2/20/18</b>		<b>1491 d...</b>	<b>No</b>												
232	Material Procurement Start	0 days	Wed 9/27/17	Wed 9/27/17	171	1491 d...	No												
233	Material HW and SW Procurement Coordination	15 days	Wed 9/27/17	Tue 10/17/17	232	1491 d...	No												
234	Material HW and SW Procurement (Including Long Lead Items)	70 days	Tue 10/17/17	Tue 1/30/18	233	1491 days	No												
235	Material HW and SW Inventory Management	5 days	Tue 1/30/18	Tue 2/6/18	234	1491 d...	No												
236	Material HW and SW Delivery to Site	10 days	Tue 2/6/18	Tue 2/20/18	235	1491 d...	No												
237	Material Procurement Complete	0 days	Tue 2/20/18	Tue 2/20/18	236	1491 d...	No												
238	<b>Phase IV Installation</b>	<b>135 days</b>	<b>Wed 9/27/17</b>	<b>Tue 4/10/18</b>		<b>1431 d...</b>	<b>No</b>												
239	<b>Installation Plan</b>	<b>50 days</b>	<b>Wed 9/27/17</b>	<b>Thu 12/7/17</b>		<b>1431 d...</b>	<b>No</b>												
240	Document Start	0 days	Wed 9/27/17	Wed 9/27/17	171	1431 d...	No												
241	Kapsch Develop Draft Document	20 days	Wed 9/27/17	Tue 10/24/17	240	1431 d...	No												
242	Kapsch Submits Draft Document to GGB [Rev0 days]	0 days	Tue 10/24/17	Tue 10/24/17	241	1431 d...	No												
243	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 10/24/17	Tue 11/7/17	242	1431 days	No												

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Manual Summary Rollup  Manual Summary  Start-only  Finish-only

Inactive Milestone  Inactive Summary  Manual Task  Duration-only

Task  Split  Milestone  Summary

Project Summary  External Tasks  External Milestone  Inactive Task

Manual Summary Rollup  Manual Summary  Start-only  Finish-only

Inactive Milestone  Inactive Summary  Manual Task  Duration-only

Manual Summary Rollup  Manual Summary  Start-only  Finish-only

Inactive Milestone  Inactive Summary  Manual Task  Duration-only

Manual Summary Rollup  Manual Summary  Start-only  Finish-only

Inactive Milestone  Inactive Summary  Manual Task  Duration-only

Manual Summary Rollup  Manual Summary  Start-only  Finish-only

Inactive Milestone  Inactive Summary  Manual Task  Duration-only

ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack Critical	1st Quarter			3rd Quarter			1st Quarter			3rd Quarter			
							Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	
244	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 11/7/17	Tue 11/21/17	243	1431 days	No												
245	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 11/21/17	Tue 11/21/17	244	1431 days	No												
246	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 11/21/17	Thu 12/7/17	245	1431 days	No												
247	Document Complete	0 days	Thu 12/7/17	Thu 12/7/17	246	1431 d...	No												
248	<b>System Maintenance Planning</b>	<b>50 days</b>	<b>Tue 12/7/17</b>	<b>Tue 2/20/18</b>		<b>1526 d...</b>	<b>No</b>												
249	Document Start	0 days	Thu 12/7/17	Thu 12/7/17	247	1526 d...	No												
250	Kapsch Develop Draft Document	20 days	Thu 12/7/17	Tue 1/9/18	249	1526 d...	No												
251	Kapsch Submits Draft Document to GGB [Rev.0]	0 days	Tue 1/9/18	Tue 1/9/18	250	1526 d...	No												
252	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 1/9/18	Tue 1/23/18	251	1526 days	No												
253	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 1/23/18	Tue 2/6/18	252	1526 days	No												
254	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 2/6/18	Tue 2/6/18	253	1526 days	No												
255	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 2/6/18	Tue 2/20/18	254	1526 days	No												
256	Document Complete	0 days	Tue 2/20/18	Tue 2/20/18	255	1526 d...	No												
257	<b>Gantry Equipment Field Test Plan</b>	<b>50 days</b>	<b>Thu 12/7/17</b>	<b>Tue 2/20/18</b>		<b>1526 d...</b>	<b>No</b>												
258	Document Start	0 days	Thu 12/7/17	Thu 12/7/17	247	1526 d...	No												
259	Kapsch Develop Draft Document	20 days	Thu 12/7/17	Tue 1/9/18	258	1526 d...	No												
260	Kapsch Submits Draft Document to GGB [Rev.0]	0 days	Tue 1/9/18	Tue 1/9/18	259	1526 d...	No												
261	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 1/9/18	Tue 1/23/18	260	1526 days	No												
262	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 1/23/18	Tue 2/6/18	261	1526 days	No												
263	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 2/6/18	Tue 2/6/18	262	1526 days	No												
264	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 2/6/18	Tue 2/20/18	263	1526 days	No												
265	Document Complete	0 days	Tue 2/20/18	Tue 2/20/18	264	1526 d...	No												
266	<b>Gantry Equipment Installation</b>	<b>15 days</b>	<b>Wed 2/21/18</b>	<b>Tue 3/13/18</b>		<b>1491 d...</b>	<b>No</b>												
267	Gantry Equipment Install	15 days	Wed 2/21/18	Tue 3/13/18	247,237	1491 d...	No												
268	<b>Gantry Equipment Field Test</b>	<b>20 days</b>	<b>Tue 3/13/18</b>	<b>Tue 4/10/18</b>		<b>1491 d...</b>	<b>No</b>												
269	Test Start	0 days	Tue 3/13/18	Tue 3/13/18	267	1491 d...	No												
270	Conduct Internal Dry-Run Tests	3 days	Tue 3/13/18	Fri 3/16/18	269	1491 d...	No												
271	Continued Configuration and Tuning	1 day	Fri 3/16/18	Mon 3/19/18	270	1491 d...	No												
272	Network Connectivity Tests	1 day	Mon 3/19/18	Tue 3/20/18	271	1491 d...	No												
273	Debug, Reconfiguration, and Retest Failures	1 day	Tue 3/20/18	Wed 3/21/18	272	1491 d...	No												

Task Project Summary Inactive Milestone Inactive Milestone Manual Summary Rollup Deadline

Split External Tasks Inactive Summary Manual Summary Progress

Milestone External Milestone Manual Task Start-only Finish-only

Summary Inactive Task Duration-only

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ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			3rd Quarter			1st Quarter			3rd Quarter		
								Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar
274	Conduct Formal Dry-Run	3 days	Wed 3/21/18	Mon 3/26/18	273	1491 d...	No												
275	Test Readiness Review/Code Freeze	1 day	Mon 3/26/18	Tue 3/27/18	274	1491 d...	No												
276	Formal Readiness Test	3 days	Tue 3/27/18	Fri 3/30/18	275	1491 d...	No												
277	Re-Testing if Needed, Test Report Preparation and Submission	2 days	Fri 3/30/18	Tue 4/3/18	276	1491 days	No												
278	GBB Reviews and Approves Test Report	5 days	Wed 4/4/18	Tue 4/10/18	277	1491 d...	No												
279	Test Complete	0 days	Tue 4/10/18	Tue 4/10/18	278	1491 d...	No												
280	<b>Phase V Transition</b>	<b>323 days</b>	<b>Wed 9/27/17</b>	<b>Fri 12/28/18</b>		<b>50 days</b>	<b>No</b>												
281	Transition Plan Document Start	0 days	Wed 9/27/17	Thu 12/7/17		1481 d...	No												
282	Document Start	0 days	Wed 9/27/17	Wed 9/27/17	171	1481 d...	No												
283	Kapsch Develop Draft Document	20 days	Wed 9/27/17	Tue 10/24/17	282	1481 d...	No												
284	Kapsch Submits Draft Document to GGB [Rev0 days]	10 days	Tue 10/24/17	Tue 10/24/17	283	1481 d...	No												
285	GBB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 10/24/17	Tue 11/7/17	284	1481 days	No												
286	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 11/7/17	Tue 11/21/17	285	1481 days	No												
287	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 11/21/17	Tue 11/21/17	286	1481 days	No												
288	GBB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 11/21/17	Thu 12/7/17	287	1481 days	No												
289	Document Complete	0 days	Thu 12/7/17	Thu 12/7/17	288	1481 d...	No												
290	<b>Data Migration Planning Plan</b>	<b>50 days</b>	<b>Fri 12/8/17</b>	<b>Tue 2/20/18</b>		<b>0 days</b>	<b>Yes</b>												
291	Document Start	0 days	Fri 12/8/17	Fri 12/8/17	289	1526 d...	No												
292	Kapsch Develop Draft Document	20 days	Fri 12/8/17	Tue 1/9/18	291	1526 d...	No												
293	Kapsch Submits Draft Document to GGB [Rev0 days]	10 days	Tue 1/9/18	Tue 1/9/18	292	1526 d...	No												
294	GBB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 1/9/18	Tue 1/23/18	293	1526 days	No												
295	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 1/23/18	Tue 2/6/18	294	1526 days	No												
296	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 2/6/18	Tue 2/6/18	295	1526 days	No												
297	GBB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 2/6/18	Tue 2/20/18	296	1526 days	No												
298	Document Complete	0 days	Tue 2/20/18	Tue 2/20/18	297	1526 d...	No												
299	<b>Training Materials Plan</b>	<b>50 days</b>	<b>Thu 12/7/17</b>	<b>Tue 2/20/18</b>		<b>1526 d...</b>	<b>No</b>												
300	Document Start	0 days	Thu 12/7/17	Thu 12/7/17	289	1526 d...	No												
301	Kapsch Develop Draft Document	20 days	Thu 12/7/17	Tue 1/9/18	300	1526 d...	No												
302	Kapsch Submits Draft Document to GGB [Rev0 days]	10 days	Tue 1/9/18	Tue 1/9/18	301	1526 d...	No												
303	GBB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 1/9/18	Tue 1/23/18	302	1526 days	No												

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Task: Project Summary, External Tasks, External Milestone, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only

Manual Summary Rollup: Manual Summary, Start-only, Finish-only

Deadline: Progress

ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			2nd Quarter			3rd Quarter					
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
304	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 1/23/18	Tue 2/6/18	303	1526 days	No												
305	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 2/6/18	Tue 2/6/18	304	1526 days	No												
306	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 2/6/18	Tue 2/20/18	305	1526 days	No												
307	Document Complete	0 days	Tue 2/20/18	Tue 2/20/18	306	1526 d...	No												
308	<b>Training Courses</b>	<b>23 days</b>	<b>Mon 10/29/18</b>	<b>Wed 11/28/18</b>		<b>1230 d...</b>	<b>No</b>												
309	Conduct Training Course	23 days	Mon 10/29/18	Wed 11/28/18		1230 d...	No												
310	<b>Cutover Plan</b>	<b>50 days</b>	<b>Thu 12/7/17</b>	<b>Tue 2/20/18</b>		<b>1431 d...</b>	<b>No</b>												
311	Document Start	0 days	Thu 12/7/17	Thu 12/7/17	247	1431 d...	No												
312	Kapsch Develop Draft Document	20 days	Thu 12/7/17	Tue 1/9/18	311	1431 d...	No												
313	Kapsch Submits Draft Document to GGB [Rev.0]	0 days	Tue 1/9/18	Tue 1/9/18	312	1431 d...	No												
314	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 1/9/18	Tue 1/23/18	313	1431 days	No												
315	Kapsch Address Received Comments and Revise Draft Document	10 days	Tue 1/23/18	Tue 2/6/18	314	1431 days	No												
316	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Tue 2/6/18	Tue 2/6/18	315	1431 days	No												
317	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Tue 2/6/18	Tue 2/20/18	316	1431 days	No												
318	Document Complete	0 days	Tue 2/20/18	Tue 2/20/18	317	1431 d...	No												
319	<b>Production Readiness Test</b>	<b>17 days</b>	<b>Wed 11/28/18</b>	<b>Fri 12/21/18</b>		<b>1230 d...</b>	<b>No</b>												
320	Test Start	0 days	Wed 11/28/18	Wed 11/28/18	309,318,309	1230 d...	No												
321	Conduct Internal Dry-Run Tests	2 days	Wed 11/28/18	Fri 11/30/18	320	1230 d...	No												
322	Continued Configuration and Tuning	1 day	Fri 11/30/18	Mon 12/3/18	321	1230 d...	No												
323	Network Connectivity Tests	1 day	Mon 12/3/18	Tue 12/4/18	322	1230 d...	No												
324	Debug, Reconfiguration, and Retest Failures	1 day	Tue 12/4/18	Wed 12/5/18	323	1230 d...	No												
325	Conduct Formal Dry-Run	2 days	Wed 12/5/18	Fri 12/7/18	324	1230 d...	No												
326	Test Readiness Review/Code Freeze	1 day	Fri 12/7/18	Mon 12/10/18	325	1230 d...	No												
327	Formal Readiness Test	5 days	Mon 12/10/18	Mon 12/17/18	326	1230 d...	No												
328	Re-Testing if Needed, Test Report Preparation and Submission	1 day	Mon 12/17/18	Tue 12/18/18	327	1230 days	No												
329	GGB Reviews and Approves Test Report	3 days	Wed 12/19/18	Fri 12/21/18	328	1230 d...	No												
330	Test Complete	0 days	Fri 12/21/18	Fri 12/21/18	329	1230 d...	No												
331	<b>Cutover</b>	<b>5 days</b>	<b>Mon 12/24/18</b>	<b>Fri 12/28/18</b>		<b>1230 d...</b>	<b>No</b>												
332	Conduct Cutover	5 days	Mon 12/24/18	Fri 12/28/18	318,330	1230 d...	No												
333	<b>Go Live</b>	<b>0 days</b>	<b>Fri 12/28/18</b>	<b>Fri 12/28/18</b>		<b>1230 d...</b>	<b>No</b>												
334	Go Live	0 days	Fri 12/28/18	Fri 12/28/18	330,332	1230 d...	No												
335	<b>Phase VI System Acceptance</b>	<b>240 days</b>	<b>Tue 7/24/18</b>	<b>Wed 6/26/19</b>		<b>1176 d...</b>	<b>No</b>												
336	<b>SYSTEM ACCEPTANCE TEST (SAT)</b>	<b>240 days</b>	<b>Tue 7/24/18</b>	<b>Wed 6/26/19</b>		<b>1176 d...</b>	<b>No</b>												

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Date: Tue 12/6/16

Task: Project Summary, External Tasks, External Milestone, Inactive Task, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, Inactive Milestone, Inactive Summary, Manual Task, Duration-only

Deadline: Progress

ID	Task Name	Duration	Start	Finish	Predecessors	Total Slack	Critical	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
337	<b>System Acceptance Test Plan</b>	91 days	Tue 7/24/18	Wed 11/28/18		1252 d...	No												
338	Document Start	0 days	Tue 7/24/18	Tue 7/24/18	230	1252 d...	No												
339	Kapsch Develop Draft Document	51 days	Wed 7/25/18	Wed 10/3/18	338	1252 d...	No												
340	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Wed 10/3/18	Wed 10/3/18	339	1252 days	No												
341	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Wed 10/3/18	Wed 10/17/18	340	1252 days	No												
342	Kapsch Address Received Comments and Revise Draft Document	20 days	Thu 10/18/18	Wed 11/14/18	341	1252 days	No												
343	Kapsch Submits Revised Document to GGB [Rev. 01]	0 days	Wed 11/14/18	Wed 11/14/18	342	1252 days	No												
344	GGB Reviews Revised Document and Sends Approval to Kapsch	10 days	Thu 11/15/18	Wed 11/28/18	343	1252 days	No												
345	Document Complete	0 days	Wed 11/28/18	Wed 11/28/18	344	1252 d...	No												
346	<b>Conduct System Acceptance Test (SAT)</b>	127 days	Fri 12/28/18	Wed 6/26/19		1176 d...	No												
347	System Acceptance Test (SAT) Start	0 days	Fri 12/28/18	Fri 12/28/18	345,334	1230 d...	No												
348	First 30 Days, 24/7 Continuous System Operations and Monitoring - Month 1	30 edays	Fri 12/28/18	Sun 1/27/19	347	1722.63 edays	No												
349	Kapsch Develops and Submit Toll System Data Collection Report - Month 1	1 day	Mon 1/28/19	Mon 1/28/19	348	1254 days	No												
350	GGB Reviews & Approve Toll System Data Collection Report - Month 1	10 days	Mon 1/28/19	Mon 2/11/19	349	1254 days	No												
351	Second 30 Days, 24/7 Continuous System Operations and Monitoring - Month 2	30 edays	Sun 1/27/19	Tue 2/26/19	348	1722.63 edays	No												
352	Kapsch Develops and Submit Toll System Data Collection Report - Month 2	1 day	Wed 2/27/19	Wed 2/27/19	351	1242 days	No												
353	GGB Reviews & Approve Toll System Data Collection Report - Month 2	10 days	Wed 2/27/19	Wed 3/13/19	350,352	1242 days	No												
354	Third 30 Days, 24/7 Continuous System Operations and Monitoring - Month 3	30 edays	Tue 2/26/19	Thu 3/28/19	351	1722.63 edays	No												
355	Kapsch Develops and Submit Toll System Data Collection Report - Month 3	1 day	Thu 3/28/19	Fri 3/29/19	354	1230 days	No												
356	GGB Reviews & Approve Toll System Data Collection Report - Month 3	10 edays	Fri 3/29/19	Mon 4/8/19	353,355	1724.63 edays	No												
357	System Acceptance Test (SAT) Complete	0 days	Wed 6/26/19	Wed 6/26/19	356,41FF	1176 d...	No												
358	<b>As Built Documentation</b>	42 days	Fri 12/28/18	Tue 2/26/19		1261 d...	No												
359	Document Start	0 days	Fri 12/28/18	Fri 12/28/18	334	1261 d...	No												
360	Kapsch Develop Draft Document	12 days	Mon 12/31/18	Tue 1/15/19	359	1261 d...	No												
361	Kapsch Submits Draft Document to GGB [Rev. 00]	0 days	Tue 1/15/19	Tue 1/15/19	360	1261 days	No												
362	GGB Reviews Draft Document and Sends Comments Back to Kapsch	10 days	Tue 1/15/19	Tue 1/29/19	361	1261 days	No												

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Manual Summary Rollup  
Manual Summary  
Start-only  
Finish-only

Deadline  
Progress

Inactive Milestone  
Inactive Summary  
Manual Task  
Duration-only

Project Summary  
External Tasks  
External Milestone  
Inactive Task



Golden Gate Bridge, Highway and Transportation District

## Quality Management Plan

# Version: 00-01

### Distribution:

Author: Robert A. Erwin	Security level: Proprietary
Technical Release: Robert A. Erwin	Operations Release: Darby Swank
Release Date KTC:	PM-Release: Peter Aczel

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## 1 General

### 1.1 Purpose and Scope

This Quality Management Plan describes the standard policies, practices and procedures that Kapsch will use to ensure the quality of products and services provided during the Golden Gate Bridge, Highway and Transportation District project meet internal and customer requirements.

This plan provides the backbone for a holistic management system structure that provides common support elements, such as document control and corrective action, for mutual use by other disciplines, such as safety or environmental management.

### 1.2 Customer Preeminence

This plan defined the minimal activities that Kapsch will follow to provide high quality and reliability to our customers. It is understood the Golden Gate Bridge, Highway and Transportation District project will likely have additional requirements. Any contractually required activities that enhance customer value, such as drawing format changes or additional qualifiers, supersede the activities within this document. For any quality assurance activities where a customer contract does not provide direction, this plan will take precedence.

## 2 Reference

### 2.1 Associated Documents

Table 1 - Associated Documents

Document Number	Document Name
322710-003	QMS Manual
WI-700511-503	Spares and RMA Procedure

### 2.2 Abbreviations and Definitions

Table 2 - Definitions

Abbreviation	Definition
8D Report	A report that uses a structured eight step approach for solving quality and process problems
AVI	Automatic Vehicle Identification
BOM	Bill of Materials
CAD	Computer-Aided Design or Drawing
CAR	Corrective Action Request

Abbreviation	Definition
COTS	(Commercial off-the-shelf) Commercial items, including services, available in the commercial marketplace that can be bought and used under contract
DGN	Proprietary CAD file format for MicroStation
DMS	Document Management System
DWG	Proprietary CAD file format for DraftSight, AutoCAD, and IntelliCAD.
ECT	Equipment Commissioning Test
FAT	Factory Acceptance Testing
HW	Hardware
ISO	International Organization for Standardization – <a href="http://www.iso.org">http://www.iso.org</a>
IT	Information Technology
NCR	Non-Conformance Report
PCO	Proposed Change Order
PDF	Proprietary document file format for Adobe
PM	Project Manager or Program Manager
PMBOK	Project Management Body of Knowledge
PMO	Project Management Office
QA	Quality Assurance
QAM	Quality Assurance Manager
QC	Quality Control
QMP	Quality Management Plan
QMS	Quality Management System
Quality Assurance	Prevention of quality problems through planned and systematic activities and processes
Quality Control	Activities and processes which detect and identify existing defects in products or services
RAR	Receiving Audit Report
RFI	Request for information
RMA	Return Material Authorization
SIT	System Integration Test
SOT	System Operational Test
SW	Software

### **3 Quality Policy**

#### **3.1 Policy Statement**

At Kapsch TrafficCom IVHS., we have established the following quality policy:

***“We will be successful by satisfying our customers with high value, high quality products and services on time all the time”***

#### **3.2 Application**

Quality Assurance is integral to all Kapsch operations and involves personnel engaged in all aspects and phases of work performance. Kapsch and our partners are committed to providing the District with products and services that fully satisfy system requirements and comply with Kapsch contractual obligations and requirements.

#### **3.3 Responsibility**

The Kapsch Quality Management Plan is based on the principle that each individual employee, supplier or subcontractor is responsible and accountable for the quality of their own work. While each team member is focused on ensuring that their contribution to the overall system exceeds the quality standards outlined in the contract documents, Kapsch also maintains a dedicated cadre of Quality Assurance and Control professionals to provide additional oversight for the entire system.

#### **3.4 Execution**

The Quality Management Plan facilitates our quality policy through:

- ≠ Training
- ≠ Policies
- ≠ Standards
- ≠ Practices and procedures
- ≠ Supporting systems and tools

These have been developed to establish quality awareness and responsibility, promote best practices, verify quality and ensure the effectiveness of the Quality Management Plan.

## 4 Quality Management Organization

### 4.1 Roles, Responsibilities and Qualifications

Table 3 - Roles and Responsibilities

Role	Responsibilities
Project Manager	Supervises all aspects of the system delivery to the Project including all QA/QC related activities performed for the project
Installation Manager and / or Maintenance Manager	Works directly with the QA/QC team on the delivery of Kapsch's scope for the Project. Responsible to ensure that the quality processes are adequately applied within the engineering and construction groups as required by the Kapsch quality policies and the requirements set forth in the Technical Requirements Document and the Scope of Work
Chief Engineer	In charge of the processes for overall Quality and Delivery from the Engineering Department. Engineering representative for all quality non-conformance related issues, and direction of engineering investigation/resolution for such issues.
QA Manager	Responsible to ensure that the Quality Management Plan is implemented during design, installation, integration and maintenance phases of projects and within the structure of the PMO. Responsible for project-related quality documentation and processes, in addition to review and auditing of project processes.
Manufacturing Manager	Responsible for the manufacturing processes within Kapsch, including related quality control. Manufacturing representative for all quality non-conformance related issues, and direction of manufacturing investigation/resolution for such issues.

### 4.2 Authority of Quality Assurance Staff

All Kapsch Quality personnel have the authority to stop work for quality-related issues.

Personnel assigned to perform inspection, testing, or monitoring of characteristics for acceptance will not be those personnel performing or directly supervising the work to be accepted. Kapsch's Quality Manager and quality assurance staff will have no responsibilities in the production of the work. Quality control staff will only have responsibilities on the production of the work and will remain independent of the quality assurance staff.

## 5 Quality Methodologies

### 5.1 Quality Assurance Methodology

The Kapsch Quality Assurance Methodology, integrating elements of Deming's Plan-Do-Check-Act Cycle and the Project Management Institute PMBOK, has been refined and proven in projects throughout North America and the world.

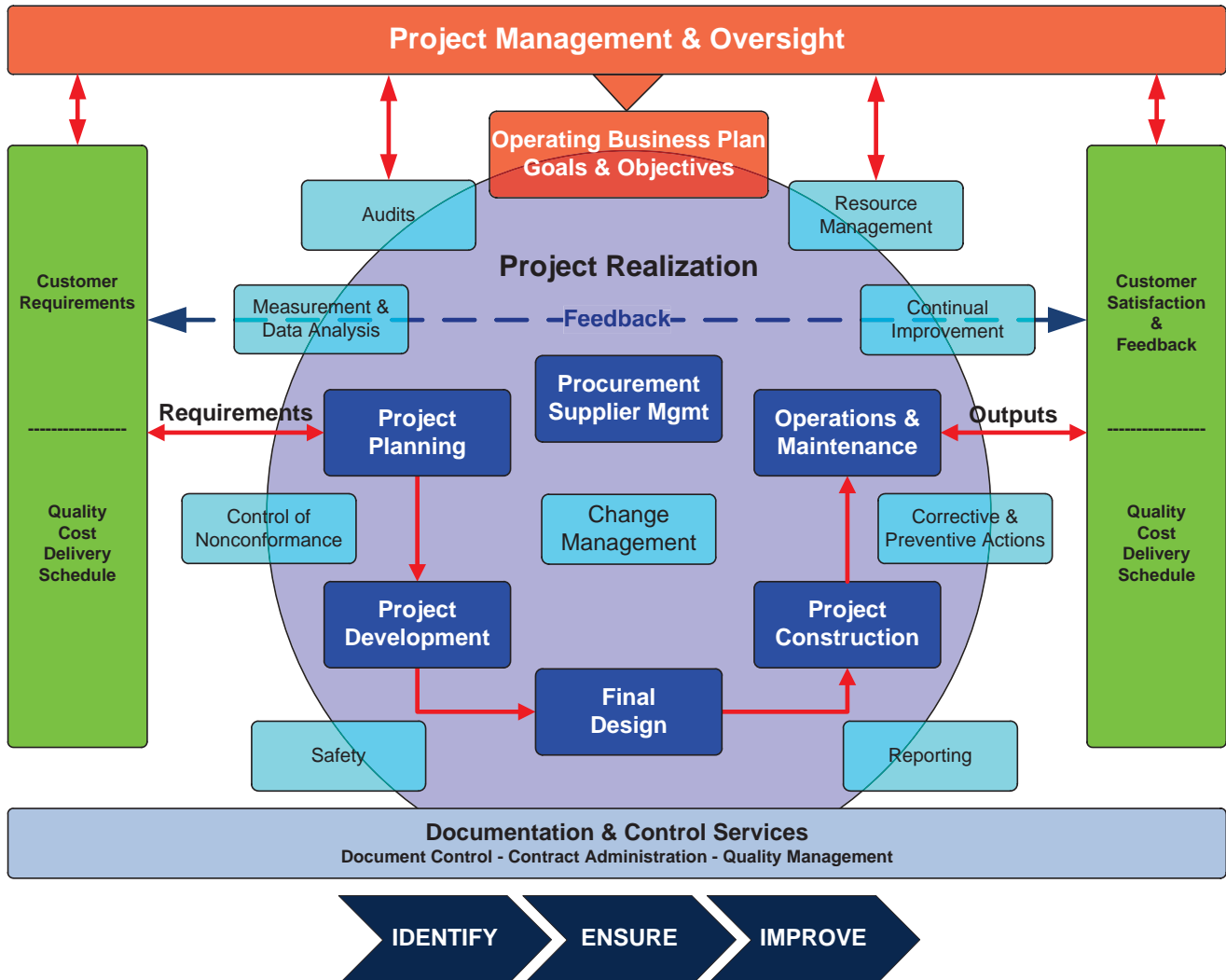


Figure 5-1 Kapsch QA Methodology

## 5.2 Quality Control Methodology

The Quality Control Methodology for Kapsch consists of a system of inspection, witness and hold points to be utilized for various products and services within the scope of a project. The objective of these methods is to verify work product quality at defined points in the workflow.

### 5.2.1 Inspection Point

An inspection point is an activity during fabrication or construction where measuring, witnessing of work or inspection normally takes place. Formal written notification is not required. If the inspector does not inspect the work at this point, the work may continue.

If an inspection does take place, the data must be recorded. Kapsch is fully responsible to ensure that this is done before continuing to the next work step.

#### 5.2.2 Witness Point

A witness point is an activity during fabrication or construction where inspection, measurement or tests must be done in place and documented. No less than 24 hours prior to reaching the witness point for a measurement or test, the contractor is required to give written notice to Kapsch of the need to attend.

On a case-by-case basis, the witnessing may be waived. In such cases, inspection may proceed without attendance. However, inspection data must be recorded and submitted to Quality Assurance for review and approval. All waivers will be given in writing prior to inspection execution.

#### 5.2.3 Hold Point

Hold points are established where responsibility for performing work is handed off from one function to another. For instance, Kapsch will not accept possession of a gantry equipment pad from the respective contractor for installation of equipment until the pads have been checked and approved by Kapsch Quality Assurance.

No added work, other than of a remedial nature, may take place until the hold point is reviewed and accepted by Quality Assurance.

#### 5.2.4 Engineering Plan Review Points

The review points listed below will be used for engineering plan reviews. These review points are based on an optimal project size.

- ≠ 30% completion
- ≠ 60% completion
- ≠ 90% completion
- ≠ Final completion

While the review points are not necessary hold points, the preceding engineering plan review should be completed and approved before commencing with any work or further design that is dependent on the correctness and accuracy of that proceeding work.

#### 5.2.4.1 Engineering Review Deadline and Holds

Each review point has a three-week deadline for completion. If approval is not given by the end of the three-week deadline, the project must consider the risk of continuing without such approval. If the determined risk is too great, Quality Assurance will place continuance of the project on hold until the review is complete.

## 6 Document Management

The Kapsch document management and review process for the Golden Gate Bridge, Highway and Transportation District project is located and described in the Golden Gate Bridge, Highway and Transportation District Document Communication Plan.

The QA Review processes for both documents and drawings involve verifying all submission requirements have been completed prior to use by the project. While the content and ownership is managed by the applicable functional discipline, the QA process verifies that all pertinent requirements are validated prior to the release of the documents.

### 6.1 DMS Redundancy

To allow for disaster recovery, Kapsch will maintain a back-up system for all Golden Gate Bridge, Highway and Transportation District project documents in a secure off-site area.

## 7 Change Orders

When changes are required, the Change Order process provides a formal instrument to communicate and control contractor and customer requested scope, time, and cost changes associated with the Golden Gate Bridge, Highway and Transportation District project. This procedure is to be used in cases where it is necessary to:

- ≠ Evaluate and/or process a change in project scope
- ≠ Evaluate and/or process a change in project cost
- ≠ Evaluate and/or process a change in project schedule

### 7.1 Change Order Process Procedure

The following steps are followed in the Change Order process to ensure that Kapsch or customer-requested changes associated within the project are thoroughly evaluated and formally approved:

- ≠ Project representative notifies Kapsch Project Manager of requested change in either scope, time, or cost associated with the project
- ≠ Kapsch Project Manager and the project representative develop a scope statement for the Kapsch Proposed Change Order (PCO) document

- ≠ Kapsch Project Manager distributes the PCO to the Kapsch Project Management Office and any internal or external team members who may be impacted by the customer's requested change
- ≠ Internal and external team members review the client's proposed change and provide individual proposals, documentation, summaries and any other documentation that assists in assessing the impact of the proposed change
- ≠ Internal and external team members submit all documentation associated with the proposed change to the Kapsch Project Manager
- ≠ Kapsch Project Manager reviews the documentation received from the internal and external team members and produces a Change Control Packet which is comprised of the following documents:
  - Updated schedule showing time impact
  - Proposals from all parties
  - RFIs / Documentation / BOMs / Correspondence regarding proposed change
  - Financial analysis and price for the change
  - Formal change order documenting time, scope, and cost impacts
  - Risk analysis incorporating the proposed change
- ≠ Kapsch Project Manager submits the Change Control Packet to the Kapsch PMO for tracking and distribution to senior Kapsch project executives for 'Go/No Go' Decision:
  - If senior Kapsch project executives determine that the change will limit Kapsch's ability to successfully complete a project, the Kapsch Project Manager will be notified of the change order has been refused
  - If senior Kapsch project executives determined that the proposed change can be implemented without negatively impacting the project, the Kapsch Project Manager will be notified that the change order has been approved
- ≠ The Kapsch Project Manager communicates the decision of the senior Kapsch project executives to the customer
- ≠ If both senior Kapsch project executives and the customer project representative approve the change order, the Kapsch Project Manager will:
  - Distribute the change order to team members
  - Mobilizes team members and implement the project change



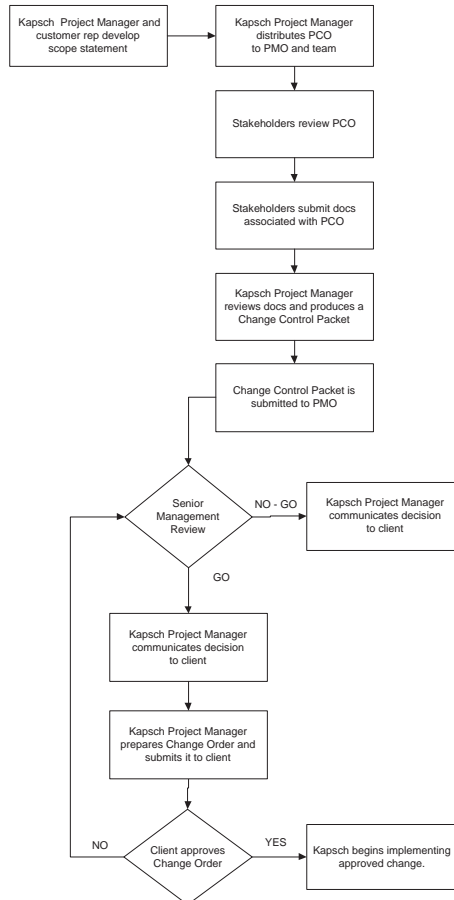


Figure 7-1 Change Control Procedure Work Flow Diagram

## 7.2 Quality Management Reviews

A PMO quality management review will be held each quarter to communicate relevant issues to the PMO and its projects as well as ensure the continuing suitability, adequacy, effectiveness and compliance of our QMS.

It is the responsibility of the PMO Quality Assurance Manager to plan, schedule and conduct these reviews. The PMO Quality Manager will prepare all materials to support and lead the management review with Kapsch Project Management.

The PMO Quality Manager will be responsible to prepare the presentation that, at a minimum, shall include the information and/or data related to the following elements of the QMP:

- a) Quality commitment
- b) Quality objectives
- c) Health and safety review
- d) Results of internal and external audits
- e) Internal and external customer feedback and satisfaction metrics
- f) Process compliance metrics
- g) Products or deliverables compliance metrics
- h) Status of corrective and preventive actions
- i) Any follow-up action items from previous management reviews
- j) Changes to the Kapsch organization or scope that could affect the QMP
- k) Any recommendations for improvement to the QMP

As a result of the management review, the Kapsch Management team shall make determinations related to the overall health of the QMP. The Kapsch Management team shall make decisions and assign action items as necessary to improve the effectiveness of the QMP and its processes, as well as resolve any identified resource needs.

The PMO Quality Manager shall publish and maintain minutes of the management review including data reviewed, decisions made and action items assigned. Action items as a result of management review decisions shall be assigned to personnel responsible within the affected area/process, tracked by the PMO Quality Manager and followed up in accordance with planned arrangements to ensure completion.

As other projects and confidential Kapsch business are discussed during these reviews, customer attendance is not permitted.

### **7.3 Kapsch Manufactured Product and Services**

All product and services performed by Kapsch manufacturing plants are controlled as described by the respective Plant Quality Assurance Manual, *322710-003 QMS Manual*.

Kapsch manufacturing facilities are certified to the ISO9001 international standard and are independently audited by a third person registrar on no less than an annual basis. The referenced Plant QMS Manual provides a portal into the processes and procedures developed to ensure Kapsch products and services are safe, reliable and meet customer expectations. Kapsch has chosen ISO9001 certification as a strategic tool for reducing costs by minimizing waste and errors, increasing productivity by engaging programs designed to acquire internal and external customer feedback, measuring and monitoring of internal processes and applying this knowledge to continual improvement activities.

#### **7.4 Control of Specific Project Records**

The Kapsch record control process is an integral part of the quality assurance program and is developed based on best practices and ISO9001 standards. Records or data essential to providing objective evidence of quality will be maintained until the expiration of a project's warranty period unless specified otherwise.

Records will be located in the Golden Gate Bridge, Highway and Transportation District project's SharePoint site, and will be accessible at all times by personnel assigned to the project.

To allow for disaster recovery, Kapsch will maintain a back-up system for all records in a secure off-site area.

Records management covers documents and drawings, testing procedures and results, and any correspondence between customers and Kapsch. Project documents and drawings, test data, checklists, correspondence, and other items pertaining to the Golden Gate Bridge, Highway and Transportation District project will be stored within the project SharePoint for period specified by the project requirements or per PMO standards, whichever is longer.

#### **7.5 Corrective Action / Preventative Action Procedure**

Kapsch understands that preventative actions are proactive and preferred, while corrective actions are reactive. However, the mechanism by which Kapsch notes and corrects these conditions makes no differentiation – they are tracked, implemented, analyzed and closed via the same procedure. As such, the process is internally referred to as the Corrective Action Process.

The Corrective Action Process is designed to prevent the occurrence of nonconformities or undesirable situations. This procedure outlines the steps required for the initiation, processing and execution of corrective actions. Corrective actions may be raised because of:

- ≠ Receiving audit report (RAR)
- ≠ Production nonconformance control (NCR)
- ≠ Customer complaints / feedback
- ≠ The analysis of returned materials
- ≠ External / Internal audits
- ≠ Safety Incident Reports
- ≠ Environmental Incident Report
- ≠ Security Incident Reports

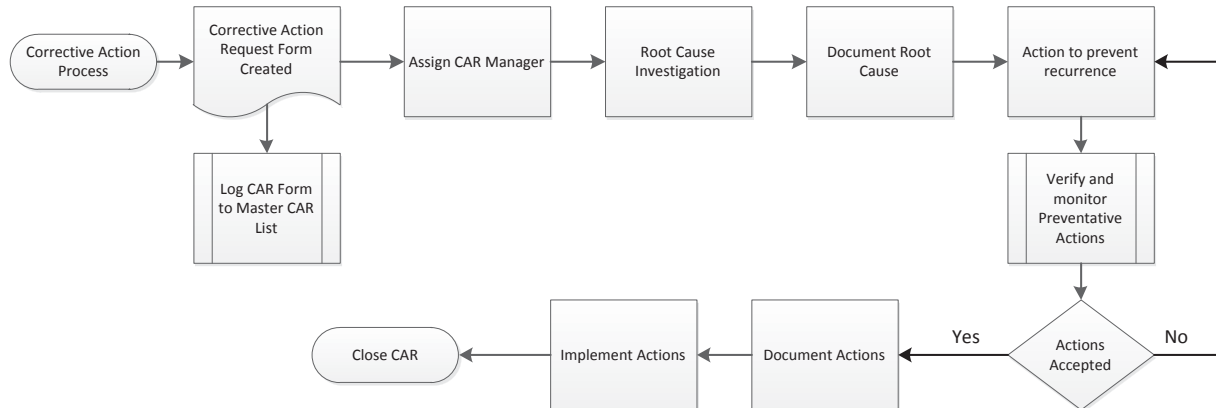


Figure 7-2 Corrective Action Process

## 7.6 Subcontractor QA

Kapsch categorizes suppliers for projects as follows:

- ≠ Standard products or services
- ≠ Existing Kapsch supplier for several years with a supplier rating already available
- ≠ Key suppliers delivering customized products (single source)
- ≠ Major enterprises, service providers, providers of standards

The key suppliers are to be audited on schedule once a year. The audit process includes:

- ≠ A subcontractor pre-audit self-assessment
- ≠ Schedule date for participants, subcontractor and Kapsch
- ≠ Prepare audit checklist according to subcontractor contract and non-conformance history
- ≠ Execution of the audit
- ≠ Issue and agree upon the audit report and recommend corrective measures, if necessary

The subcontractors are obligated to inform Kapsch immediately when technical, quality relevant or logistic changes regarding the supplied components are made. Such changes can only be executed after approval by Kapsch.

When necessary, in-process inspections with appropriate hold points will be designated by Kapsch to be carried out by Kapsch personnel at the subcontractor. Continuation of fabrication, as well as final shipment of the subject materials, is contingent on inspection approvals by Kapsch.

### 7.6.1 Complaints and Reclamation to Sub Contractors

Kapsch will issue all complaints to subcontractors in writing. After analysis, the subcontractors are obligated to set corrective measures to mitigate the complaint as well as set preventive measures to avoid recurrence after consulting Kapsch. These analyses have to be done in written form, such as an 8D-report, and have to be reported. The subcontractor is required to demonstrate the effectiveness of corrective and preventative measures.

### 7.6.2 Audit Plan for Subcontractors

The PMO subcontractor list will contain only subcontractors with signed subcontracts, memorandums of understanding or valid teaming agreements. It is a living document and continuously updated. Content of subcontractor list includes but is not limited to:

- ≠ Supplier name, address, contact
- ≠ External Contact
- ≠ Internal (Kapsch) contact
- ≠ Classification
- ≠ Involved Projects
- ≠ Audit Scope
- ≠ Audit Period

## 7.7 Returned Material Authorization

The processing of RMAs within the Golden Gate Bridge, Highway and Transportation District project will be performed as defined within WI-700511-503 (Spares and RMA Procedure).

## 7.8 Quality Assurance for Test Procedures

Results of all testing activity will be submitted to the Golden Gate Bridge, Highway and Transportation District project in a report for their review.

Quality assurance measures will be implemented within all test procedures, such as the FAT, ECT, SIT and SOT series. These measures are meant to ensure that all data recorded during the test procedures is:

- ≠ Stored - Properly saved in multiple spots and backed-up to a remote server in read-only mode
- ≠ Correct - The intended data, as per the test procedure
- ≠ Complete - Complete as recorded and verified as such
- ≠ Identified - Identified clearly by file name as to its content and date of capture
- ≠ Logged – Record that the test was performed and followed procedure

### 7.8.1 Storage

The primary and complete data from testing must be stored in a controlled, consolidated location that is backed up to the Kapsch IT network. For additional protection, a remote server location shall be configured such that data placed in primary storage is read-only and that no one individual may alter or overwrite the original data. High-level storage folders shall have a common naming convention such that searching for and identifying specific test data files is unambiguous. The low-level storage folders shall have folders labeled as, or similar to, “Data” and “Results”.

### 7.8.2 Review for Correctness

A review of the data during and/or directly after the test shall confirm that the appropriate data was recorded. This review may include, but not be limited to, examination of headers and the data itself, confirmation of correct log file name and “save to” location, and assurance that the proper data fields (i.e. AVI contains tag data) and parameters (i.e. reader configuration file) are recorded.

### 7.8.3 Review for Completeness

Upon completion of the test, the data shall be reviewed for completeness. This involves tasks such as checking file length or size against known lengths or sizes, or checking for proper start and endings to the file (i.e. data does not start or end mid data stream). If feasible, the file shall also be reviewed for any dropouts or blank sections, indicating missing or unrecorded data.

### 7.8.4 Identification of Test Data

All data files must have a standard naming convention that indicates, at a minimum, the name or ID of the test procedure and the date captured. Data files shall not be comprised of multiple and different tests – each test shall have its own dedicated data file (i.e. Test A and Test B should not be one large file called Test AB.dat).

### 7.8.5 Test Data Log

A log shall be maintained for each of the FAT, ECT, SIT and SOT executions. This log shall record pertinent information associated with performance of the test cases and will serve as a second source of information to ease locating the recorded data.

### 7.8.6 Non-Electronically Recorded Data

Some data may not lend itself to being recorded electronically and must be recorded by manual data entry or handwritten. Any handwritten data must be transcribed to an electronic file and follow the preceding measures that have been defined. Handwritten originals must be retained.

#### 7.8.7 Test Anomalies

Any non-relevant test anomalies caused by human error or machine error shall be recorded and identified as such in the log file. Test personnel and any project witnesses shall discuss a strategy for acceptance, discard, or re-run of the test. The decision shall be noted in the comments column of the report.

#### 7.8.8 Data Analysis

For post-test data analysis, the raw data shall be copied from the storage server and processed in the conventional and internally accepted manner. Any calculations or analysis performed electronically shall be saved and identified as such, and stored in the Results folder. Any analysis performed by hand shall be retained, and if feasible, scanned and saved in the Results folder as a .pdf file.

#### 7.8.9 Sign-off and Test Report

As part of the Test Plans, there must be a section for each test case where an authorized representative of the respective project customer will sign-off on the test. This sign-off must contain verbiage to confirm agreement that the test was performed and proper procedure was followed. It must also state that the sign-off is not an acceptance or approval of the results or findings. It is understood that approval of the results is tied to approval of the Test Report for each series within the specific project.

The data shall accompany the Test Report and be archived onto transportable medium (DVD, memory stick) or may be transferred via FTP, dependent on customer requirements. Kapsch will retain the test data and results for a minimum of two years after the end of the warranty period for this project.

### 7.9 Project Submittals

Kapsch will prepare and provide all submittals and documents using English units of measure, unless otherwise specified by specific project request. Each submittal will be furnished in a customer-compatible electronic format. If requested, hard copies will be provided. The electronic copy will be in a suitable format (e.g. PDF) or in the format in which the work was originally created, unless stated otherwise by customer requirements. The minimum sheet size for submittals will be 8.5 inches by 11 inches. The maximum sheet size will be 36 inches by 120 inches. Every page in a submittal shall be numbered in sequence.

Each submittal will be full and complete, unless stated otherwise. Each submittal will be labeled uniquely using the applicable standard Kapsch template, unless another format has been defined within the customer contract.

The document name shall be made up of several different elements to help identify the project, the document (sub or main), release\submitted date and version.

Revised submittals will bear a numeric designation, consisting of the version of the document and the submittal day. Any changes made on a revised submittal will be identified and noted on the revised submittal.

### 7.9.1 Submittal Package Contents

Unless otherwise specified by contract or project requirements, the standard submittal package will consist of:

- ≠ One hardcopy in a binder
- ≠ One copy on disc as PDF
- ≠ Transmittal letter

While more than one package may be required a particular project, each project will submit at least the package detailed above.

### 7.9.2 Design Submittals

Designs will be submitted to customers in MicroStation formats (.dgn & .dwg), unless otherwise specified by the project contract. Design deliverables will include a title block, containing, at a minimum, the following information:

- a) Date of issuance and including all prior revision dates.
- b) Project name
- c) Contract title and number.
- d) The name of the Designing entity.
- e) Stage of development.
- f) Reference to applicable Technical Documents and Amendments.
- g) If required, review and acceptance or approval from a Governmental Entity
- h) Review stamp.
- i) Action block space - All deliverables shall include a sufficient blank space in which a customer may list required actions to be taken.
- j) When calculations accompany drawings in a Submittal, cross-references from the body of the calculations to the individual drawing to which the pages of the calculations pertain.
- k) Organization of the CAD drawings and associated documents in a logical manner, having a uniform and consistent appearance, and clearly depicting the intention of the design.

### 7.10 Requests for Information (RFI)

The purpose of the Request for Information (RFI) is to provide a formal instrument to communicate and clarify questions, statements, drawings, and any other issue surrounding a customer project. It is the Kapsch procedure to be used in cases where it is necessary to:

- ≠ Confirm the interpretation of a detail or other understanding as to the way a component of the work should proceed



- ≠ Secure written direction or other clarification from the appropriate party that is necessary in order to allow the work to proceed
- ≠ The activity is a crucial element of the complete project record

This section defines the manner and means that all parties involved with a customer project exchange formal communication and secure information and/or clarify information required for them to conduct their responsibilities successfully.

#### 7.10.1 RFI Submitted by a Customer

As soon as a Request for Information (RFI) is received by a Kapsch representative, the following actions must take place:

- ≠ The RFI will be forwarded to the respective Kapsch Project Manager
- ≠ The Kapsch Project Manager will upload the RFI to the project's SharePoint site
- ≠ Within 24 hours, the Kapsch Project Manager forwards the RFI to the appropriate Technical Lead
- ≠ The Technical Lead reviews the RFI and either provides the answer or notifies the Kapsch Project Manager which subcontractor needs to answer the RFI
- ≠ Kapsch Project Manager forwards the RFI to the necessary subcontractor
- ≠ Subcontractor reviews, answers, and returns the RFI to the Kapsch Project Manager
- ≠ Kapsch Project Manager reviews the RFI and uploads the answer to the project's SharePoint Site

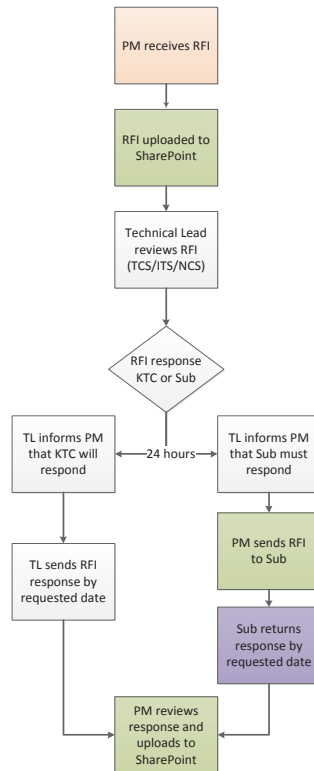


Figure 7-3 RFI Submitted By Customer Work Flow Diagram

### 7.10.2 RFI Submitted By Subcontractor

When a subcontractor needs to file a Request for Information (RFI), the following actions must take place:

- ≠ Subcontractor uploads the RFI to the project SharePoint
- ≠ Within 24 hours, Kapsch Project Manager reviews the RFI and forwards the request to the appropriate Technical Lead
- ≠ The Technical Lead reviews the RFI and either provides the answer to the RFI or notifies the Kapsch Project Manager that the customer needs to answer the RFI
- ≠ Kapsch Project Manager notifies the appropriate customer contact that an RFI that needs customer attention is posted on the project SharePoint Site
- ≠ The customer reviews, answers and returns the RFI to the Kapsch Project Manager
- ≠ Kapsch Project Manager reviews the RFI and ensures the answer is uploaded to the project SharePoint Site
- ≠ Kapsch Project Manager notifies subcontractor that an answer to the RFI has been uploaded to the project SharePoint

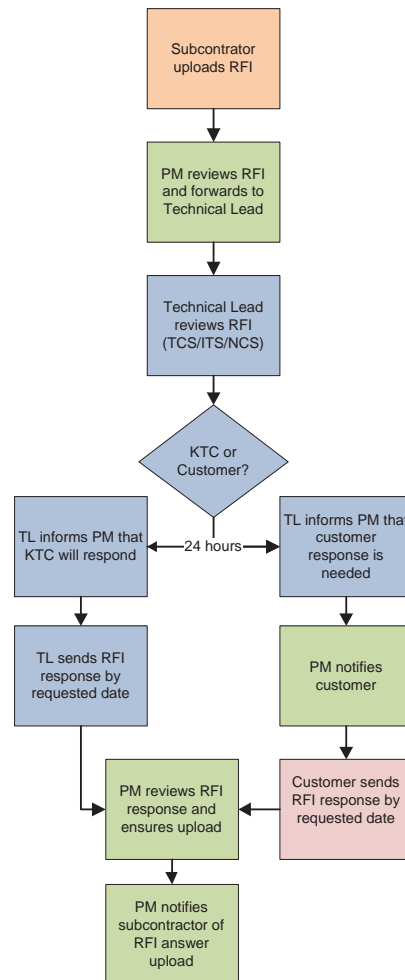


Figure 7-4 RFI Submitted by Subcontractor Work Flow Diagram

### 7.10.3 RFI Submitted By Kapsch

When information necessitating a Request for Information (RFI) is needed by a Kapsch representative, the following actions must take place:

- ≠ The Kapsch representative sends RFI to Kapsch Project Manager
- ≠ Kapsch Project Manager uploads RFI to customer SharePoint Site
- ≠ Kapsch Project Manager notifies the appropriate customer contact that an RFI that needs customer attention is posted on the project SharePoint Site
- ≠ The customer reviews, answers and returns the RFI to the Kapsch Project Manager

- ≠ Kapsch Project Manager reviews the RFI and ensures the answer is uploaded to the project SharePoint Site
- ≠ Kapsch Project Manager notifies the Kapsch representative that an answer to the RFI has been uploaded to the project SharePoint

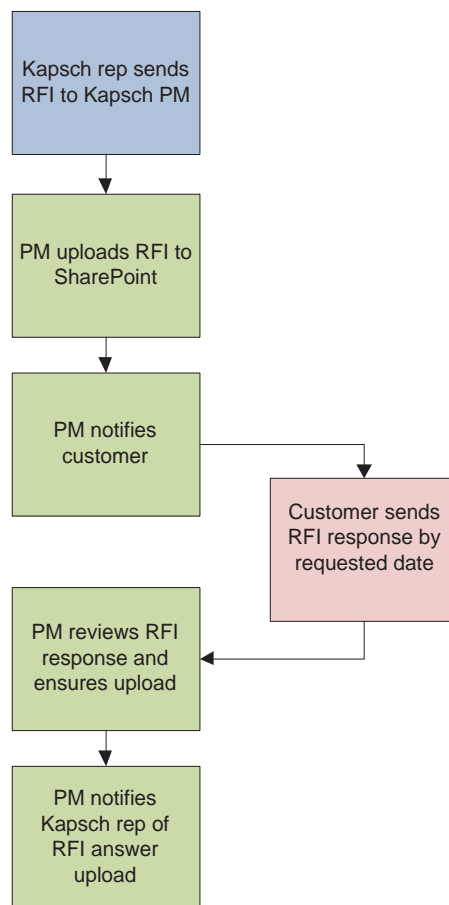


Figure 7-5 RFI Submitted By Kapsch Work Flow Diagram

## 7.11 Project QA Reporting

### 7.11.1 Reports

Quality reports will use a checklist format to the greatest degree possible. The checklists are to be created and reviewed for adequacy as part of the quality assurance process. These checklists should define all aspects to be

evaluated and verified in order to confirm that a component, product or system fully meets quality and acceptance standards per Kapsch and applicable customer requirements. Once the format and content of a checklist template is fully reviewed by Kapsch Quality Assurance for completeness, the checklist is approved for use on the applicable project.

All verification activities must be recorded in reports and made available on the District project SharePoint for review. Each report will be in PDF or similar electronic file format. All reports will have a unique title or report number. Any report containing more than one page must include page numbering and should contain brief executive summary on the first page that presents the main content and findings of the report.

## **8 Quality Auditing**

The purpose of this section is to define the process by which Kapsch shall schedule, conduct and report results of quality audits conducted to verify effectiveness of PMO, project-specific processes and subcontractor/supplier quality. The objective is to identify opportunities for improvement and proactively mitigate risk.

### **8.1 Internal QA Auditing**

Internal audits will evaluate the effectiveness and efficiency of the quality management system within the Kapsch PMO and specific projects. Kapsch PMO will perform ongoing regular internal audits for all its department level processes, where these processes touch the various PMO projects and to any specific project requirements. Additional audits with a specific focus on health & safety, environment and security will also be conducted.

#### **8.1.1 Internal Audit Scope**

In addition to any auditing that may be required within the contract of this specific project, the PMO and all projects are audited for the following practices:

- ≠ Project Management Plan (PMO or project-specific)
- ≠ Quality Assurance Plan (PMO or project-specific)
- ≠ Document Control Plan (PMO or project-specific)
- ≠ Safety Plan (PMO or project-specific)

### **8.2 Audit Scheduling**

Each key process listed above will be audited annually. An exception can be made by the QAM to change the frequency to two years for key processes that have not had corrective actions issued in the previous internal and external audits. The audit frequency may be increased due to major findings in the previous audits.

The audit schedule will be prepared by the Quality department with the intent of scheduling the audits throughout the entire year, where practical.

The Quality department will assign auditor or auditors for each process to be audited as per the audit schedule. Properly trained project personnel may be used to support audit activities, provided the personnel assigned comply with the requirements of this plan.

### **8.3 Audit Team**

All auditors will be trained compliant to ISO 19011 standard guidelines for auditing. Auditors will be selected to ensure objectivity and impartiality of the audit process. Auditors will not audit their own work.

### **8.4 Audit Notification**

The audit team will contact the process owner and any other relevant stakeholders to be audited so that a mutually acceptable time for the audit will be determined. The process owner and other stakeholders must do their best to accommodate the schedule and timeline proposed by the audit team.

### **8.5 Audit Criteria & Execution**

The Quality Assurance Manager or other assigned audit team members will develop a checklist using the PMO audit report template, which is to be populated with requirements from the relevant process document. This checklist will be used by the auditors when conducting the audit. The auditors will also review the previous audit results to assist in guiding the direction and focus of the current audit.

#### **8.5.1 Classification of Findings**

The findings will be classified as follows:

- ≠ 'Pass' – current, full compliance with requirement
- ≠ 'Partial' – compliance with requirement under way
- ≠ 'No' – no compliance or action toward compliance with requirement
- ≠ Opportunity for Improvement – area where compliance or performance could be improved

#### **8.5.2 Audit Findings**

The audit team will select minimum of five samples to verify audit evidence, where practical.

The audit team will collect audit evidence and review them with the Quality Assurance Manager to determine the severity of any adverse audit findings.

Each finding must be directly correlated to a specific section of the audited process document.

Each finding will be discussed with the process owner prior to the issue of the audit results summary or correction notice.

#### 8.5.3 Preliminary Audit Results Report

Upon completion of the audit investigation, the audit team will issue a preliminary audit report to the process owner, project or department manager and interviewed stakeholders. This report will contain auditor narrative as well as random samples collected from the internal audit. The report must have a section that details any auditor findings, recommendation and suggested corrective actions.

#### 8.5.4 Closing Meeting

A closing meeting will be scheduled, preferably within a week of the completion of the audit investigation. The meeting will include the audit team, process owner, project or department manager and the interviewed stakeholders. After any audit findings are presented, any other required corrective actions will be discussed among and agreed upon by the auditor and the respective team.

#### 8.5.5 Final Audit Report

After the closing meeting, the final audit report will be compiled by the audit team and distributed by the process owner and project or department manager. This report will include all of the elements of the preliminary report, with the addition comments provided by closing meeting participants. Any required corrective actions, the responsible parties for each action and the due dates agreed upon are also to be recorded in the final audit report.

The content of each final audit report will be presented during the PMO quality management review.

#### 8.5.6 Correction, Corrective Actions and Effectiveness Verification

A follow-up audit, within 60 to 180 days, should be added into the audit schedule to verify that the agreed corrective actions are fully implemented and effective in eliminating the related causes of nonconformance and preventing recurrence.

### 8.6 Quality Control of Products and Services

#### 8.6.1.1 Contractual Agreements

Subcontractors to Kapsch are required by our standard contracts and service agreements to provide adequate documentation to demonstrate that the quality of their provided materials and services meet the expressed expectations of Kapsch and our customers.

This submitted documentation must be reviewed by respective project, integration and quality assurance personnel with oversight from the PMO QA team.

#### 8.6.1.2 Control and Inspection

The control and inspection of the subcontractor is in the responsibility of the assigned Kapsch project manager, who is supported by PMO and project quality assurance in the completion of required quality holds and inspections.

While physical verification and laboratory testing are the preferred methods of verification, the following certificates may be accepted as partial or full evidence of compliance at the discretion of the PMO / project QA team or project contract:

- ≠ Certificates of compliance, conformance or quality
- ≠ Certificates of chemical or material composition
- ≠ Certificates of test
- ≠ Test reports

#### 8.6.1.3 Control and Inspection

The incoming components inspection of hardware bought-in products is sourced out to the subcontractors. The agreed regulations and formalities have to be compiled with by the subcontractor.

The specific quality relevant data and documents have to be submitted to Kapsch by the subcontractor. The control and inspection of the subcontractor is in the responsibility of the respective subcontract manager of Kapsch.

#### 8.6.1.4 Documentation

Documentation is done by checking the requirements specification against the certificate of analysis and inspection report. The certificate of compliance with the order confirms the final clearance.



## 9 Inspection Plan

The Golden Gate Bridge, Highway and Transportation District project quality inspection plan ensures that duly trained and authorized personnel conduct the necessary inspections and oversight to ensure the consistent quality of our products and services.

The following inspection plan is broken down by phase, showing the inspections to be performed, the responsible party, the frequency of inspection and the expected product of the inspection activity.

Table 4 – Inspection Plan

Details	Check	Who is Checking	Frequency	Documentation
Road Site Planning, Construction Works, Steel Works & Installation (TCS and ITS)				
Road Side Infrastructure	Road accessory / subcomponents	Kapsch	100% control	Supervision (Tool: Field Service Manager)
	Power connection & lightening protection	Kapsch	100% control	Revision reports
Gantries (different types)	Steelwork, structural analysis, production & installation	Kapsch	Sample	Field Service Manager certificate of steel grade, laboratory results, steel welding protocols, coating / galvanizing protocols
Installation	Equipment & cabinet installation	Kapsch	Sample	Health & Safety Plan, Update Field Service Manager
	Data & power connection	Kapsch	Sample	Test certificate, measurement report
Documentation	Final planning document	Kapsch	100% control	Checklist for single station

Details	Check	Who is Checking	Frequency	Documentation
				(Tool: Field Service Manager)
As built documentation	Check for relevance and content	Kapsch	100% control	Checklist for single station item in infrastructure database
Road Safety	Road safeguarding measures for all activities affecting the actual traffic	Kapsch	Sample	Checked health & safety plan
	Site inspection spot tests	Kapsch	sample	Site inspection report / summarized, site book
<b>Provision and Installation of TCS non-Kapsch Equipment / Kapsch equipment</b>				
Provision TCS equipment (non Kapsch)	Provision of all equipment to be mounted at the road side (excluding Kapsch equipment): cabinet, etc.	Supplier (Sick, Dell, B&R, etc.)	100% control	Certificate, final clearance notes
Kapsch ORT products	AVI Antennas, Cameras	Kapsch Components	100% control	Certificate, final clearance notes
Installation ORT equipment	Installation of all equipment to be mounted at the road side (including Kapsch equipment): cabinet, cables, transceivers, scanners, cameras, brackets,	Kapsch	100 % control	Test reports, Test records, Failure tracking tool

Details	Check	Who is Checking	Frequency	Documentation
Provision and Installation of ITS and NCS non-Kapsch Equipment / Kapsch equipment				
Provision ITS and NCS equipment (non Kapsch)	Provision of all equipment to be mounted at the road side cabinet,	Final clearance at supplier (according to contract)	Supplier (Daktronics, Wavetronics, Dell ...)	100% control Certificate, final clearance notes
Kapsch ITS products	AVI Antennas over GP Lanes	Final clearance at Kapsch IVHS.	Kapsch IVHS	100% control Certificate, final clearance notes
Installation ITS equipment	Installation of all equipment to be mounted at the road side (including Kapsch equipment): cabinet, cables, transceivers, scanners, cameras, brackets,	Hardware & Software Testing	Kapsch TrafficCom	100 % control Test reports, Test records, Failure tracking tool
Support Shelters – Hardware (HW), Software (SW), Hosting				
Central System - installation of HW & COTS-SW (plus IT-HW for workplaces)	Installation of IT hardware (server, storage, work places, network components,...) and COTS software	Hardware & Software Testing	Kapsch TrafficCom	100 % control Test reports, Test records, Failure tracking tool

Figure 9-1 Overview Product Quality checks

### 9.1.1 Checklists

As described in the previous sections, Kapsch will conduct its quality inspections and audits using checklist-based tools to the most beneficial degree possible. Project-specific checklists are prepared using standard Kapsch quality checklist templates for the required activity. Any checklist templates used and subsequent reports generated will be stored on the Golden Gate Bridge, Highway and Transportation District project's SharePoint.

## 9.2 Design Quality Management

The quality and reliability of Kapsch design and engineering activities are controlled by two standalone documents that supplement this primary quality plan. Those two documents are the System Engineering Plan and the Software Development Plan.

**10 Detailed Description of Document Changes**

No.	Version	Status	Date	Authors	Type of the change
00	00-01	DRAFT	2016-11-09	RER	Proposal draft based on PMO QMP

Reference to the status- and version administration:

Status:

**processed** the document is being processed

**released** the document has been checked and released by quality assurance; it can only be modified if the version number is updated.

Versions:

Take place in two stages. Accepted documents receive the next higher integral version number.

00-01, 00-02 etc.	Draft , not released versions with the status of “ <b>Processed</b> ”
01	Draft submitted version with the status of “ <b>Released</b> ”
01-01, 01-02 etc.	Revisions to incorporated comments with the status of “ <b>Processed</b> ”
02	Final submitted version for approval with the status of “ <b>Released</b> ”

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END OF DOCUMENT

## Document Control

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<b>File Name:</b>	20161202_Kapsch_GGB_Maintenance Plan_Draft_v1.0
<b>Project Reference #:</b>	
<b>Project Title:</b>	Toll System Implementation and Maintenance
<b>Client:</b>	Golden Gate Bridge
<b>Project Manager:</b>	Tony Marti

## Change Notice

Revision#	Change Reason	Produced by	Reviewed by	Date Completed
1.0	Draft Version	Mark Moser		12/02/2016

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## 1 Introduction

The purpose of the Maintenance Plan is to address the various components of the Golden Gate Bridge (GGB) Toll Collection System (TCS) health and accuracy. The plan addresses the following aspects of system maintenance:

- Maintenance Policy - Policies and procedures for maintenance and associated personnel
- Maintenance Strategy - Overall maintenance program for equipment and associated procedures
- Maintenance Program – High level procedures for maintenance of the system
- Maintenance Checklists - Detailed daily/weekly/monthly procedures for system maintenance
- Maintenance Responsibility - Description of GGB and/or Kapsch responsibilities

## 2 Remote Operations and Maintenance System (ROMS)

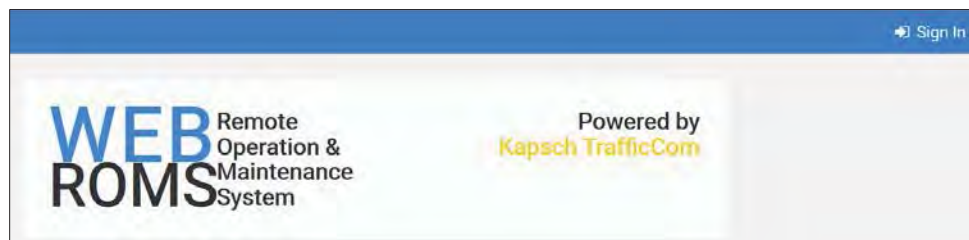
### 2.1 Introduction

ROMS is a web application that reports on ROMS data using a Java web service middle layer. The ROMS application will be accessible via the web using the project specific URL. The user will only need to navigate to the URL, using Google Chrome Browser, which the application is hosted on; no additional software will be required. After navigating to the URL, the browser will download all the necessary files to temporary local storage automatically. These temporary files, consisting of JavaScript and HTML, are used to make the ROMS application dynamic.

ROMS is built using HTML5, JavaScript, and a Java SOAP based web service layer. JavaScript uses the Kendo UI framework among other core JavaScript libraries. The application uses the Model View Controller Design Pattern to maintain separation of duties.

### 2.2 ROMS Login

The ROMS application is accessed through navigating to the URL in your Web browser. Then, click the Sign in button on the top right.



**Exhibit 2.2-1: ROMS Application Launch Window**

When the ROMS application launches the Login Screen will appear, shown in the exhibit below. The same user ID and password used to access the Host Reports application should be used to access the ROMS application.

**Sign In**

**Username**

Username

**Password**

Password

➔ Sign in

**Exhibit 2.2-2: ROMS Application Login Screen**

## 2.3 Architecture

The ROMS application uses the Model View Controller (MVC) design pattern. ROMS is broken up into different pieces: The View which consists of the screens and widgets that the user interacts with, the Controller which consists of all the business logic, and the Model which contains data for the View.

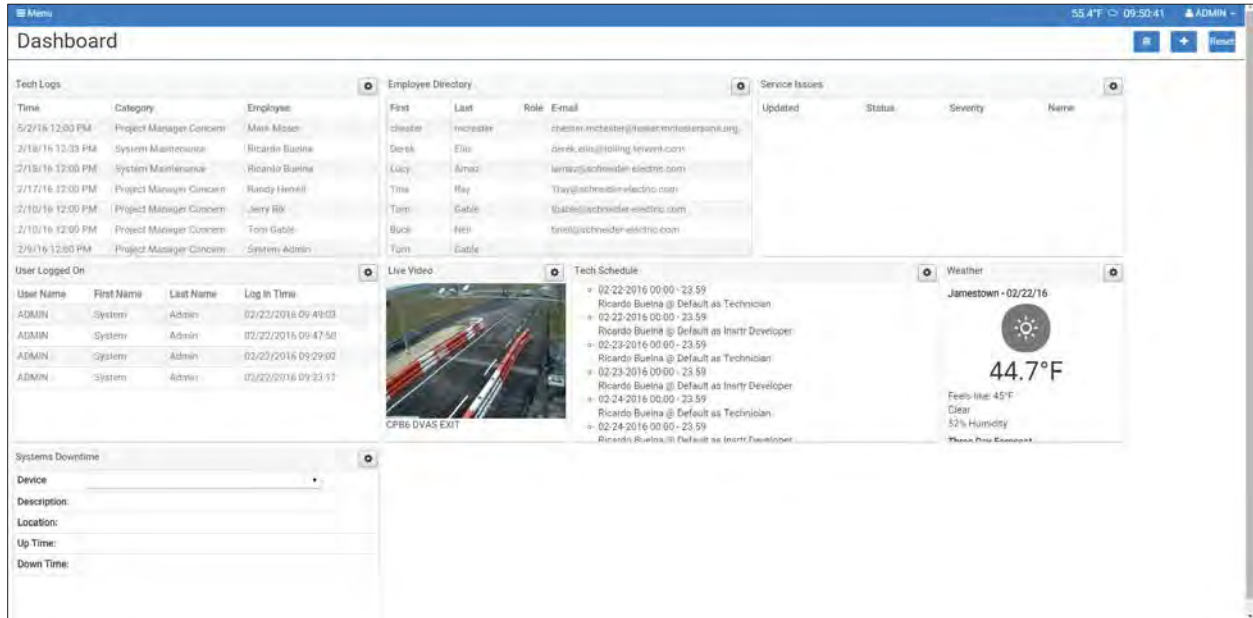
- Web Application – Top Level
  - Model – Data Container
  - View – HTML
    - Widget
    - Screen
  - Controller – JavaScript
    - Widget
    - Screen
- Web services – Top Level
  - Model – Data Container (cached data or database connection)
  - View – The exposed web service calls
  - Controller – Java

The ROMS Controller communicates via SOAP based web service calls to the middle tier. For example, the Controller requests data from web services for screens like Maintenance (ticketing), Zone and Plaza Detail, Inventory, and the Toll Map View. ROMS make requests to the Web services upon user based actions. ROMS is session based, and the User Interface (UI) will store information about the session on the server side. The session Identification (ID) will need to be passed to the web service call in order to validate it is coming from someone who has been authenticated.

## 2.4 ROMS Screens

### 2.5 Dashboard

After authentication, the ROMS dashboard is the user’s landing page. The dashboard provides the user with a quick and easy way to view information about the roadway at a glance. The user can customize his or her dashboard layout to better suit their responsibilities.



**Exhibit 2.5-1: ROMS Dashboard Example Screen**

The dashboard contains many types of widgets. Widgets are the display components on the dashboard showing the data from the roadway. Some widgets that are available for the dashboard are the weather, video, technician logs, service issues, employees, technician schedule, recent transactions, and inventory. Some of the customizable data for each widget includes color, location, and plaza location.

#### 2.5.1 Toll Map

The Toll Map screen is used as a way to get information about the roadway quickly. This is accomplished via a map that has the status of the plazas superimposed on it and a chart that shows tag penetration. The user will also be able to issue remote commands to the zone controllers from this screen.

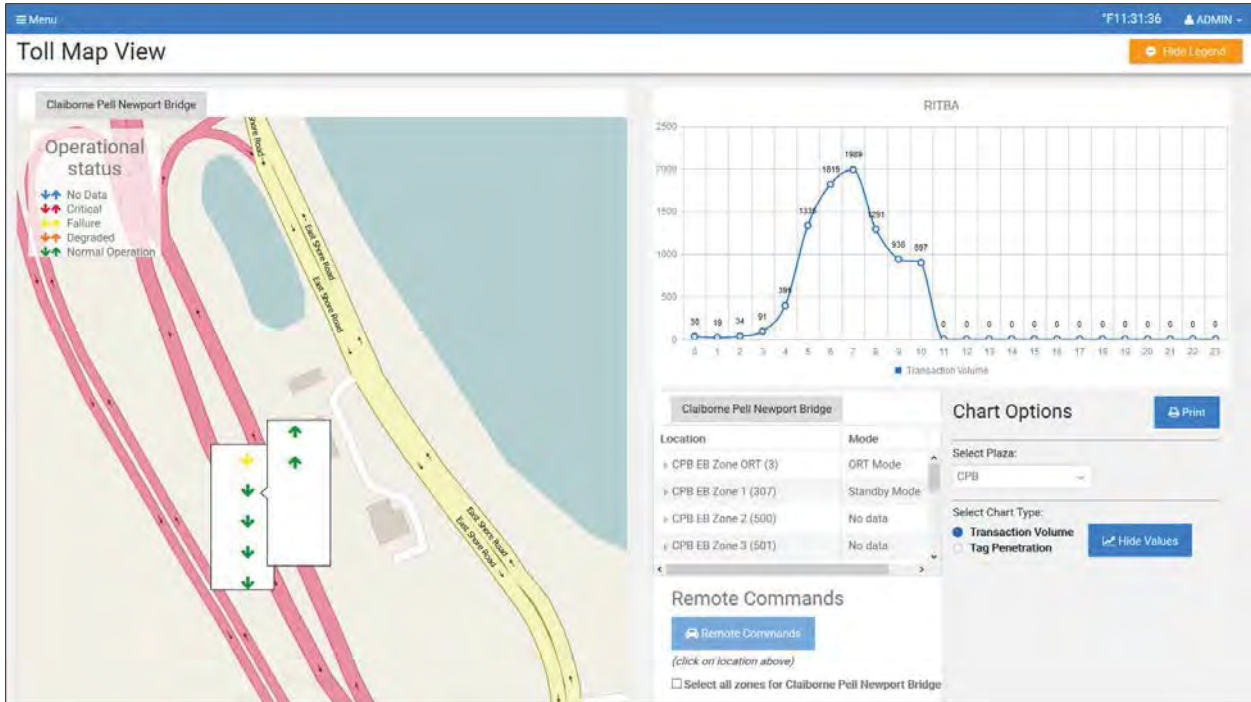


Exhibit 2.5.1-1: ROMS Toll Map Screen

### 2.5.2 Backend Systems

The Backend Systems screen is used to show diagnostic messages from all devices within a system. The screen displays a locations tree that allows the user to select the component they would like to view diagnostic messages from. The table shows the diagnostic message broken down into message, alarm level, alarm number, timestamp, lane number (if available), and plaza ID.

Alarm Message	Alarm Level	Alarm Number	Event Timestamp	Lane Number	Plaza ID
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:40		1
Lane Controller is active for ROMS	A	850008	02/22/16 09:55:44		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:44		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:43		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:39		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:38		1
Lane Controller is active for ROMS	A	850008	02/22/16 09:55:38		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:34		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:33		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:56:29		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:28		1
Lane Controller is active for ROMS	A	850008	02/22/16 09:55:28		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:24		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:23		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:19		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:18		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:14		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:13		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:09		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:08		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:04		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:55:03		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:54:59		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:54:58		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:54:54		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:54:53		1
NetTransport_recv_thread: Error receiving	E	617031	02/22/16 09:54:49		1

Exhibit 2.5.2-1: ROMS Backend Systems Screen

### 2.5.3 Inventory

The Inventory Management screen is used to manage equipment and inventory types. This feature allows the ROMS user to modify the details of each inventory item such as cost, order quantity, warranty information, etc., as well as create new inventory items. From this list of items, purchase orders can be created and populated.

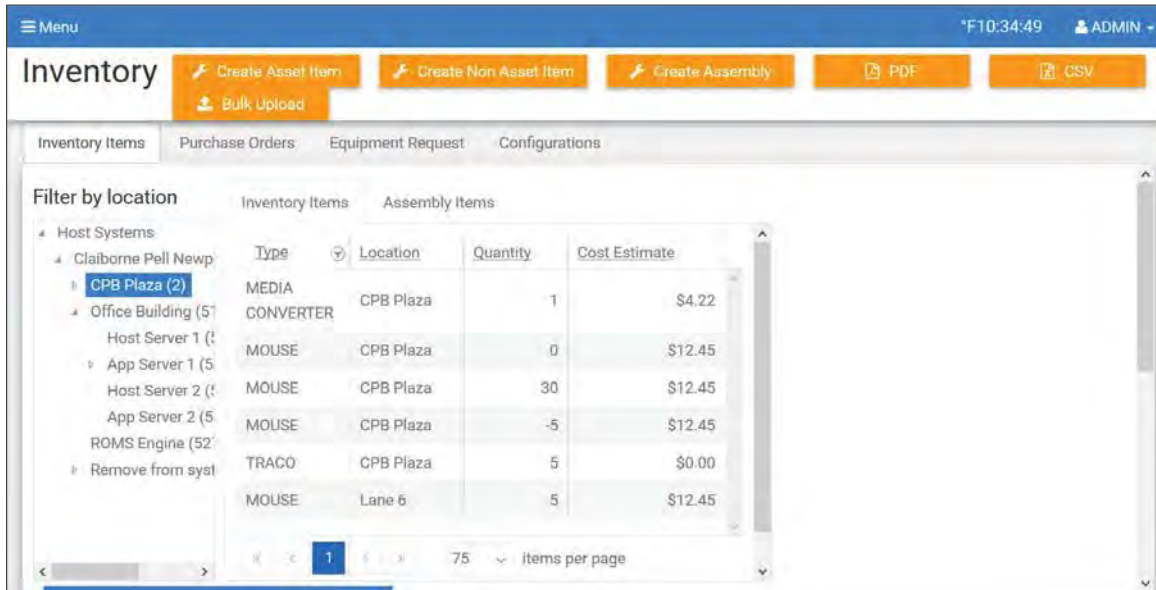


Exhibit 2.5.3-1: ROMS Inventory Screen

### 2.5.4 Live Video

The Live Video screen is a tool used to select multiple cameras for parallel viewing. The purpose of this screen is that it allows multiple streams at the same time to view many locations on the road way.

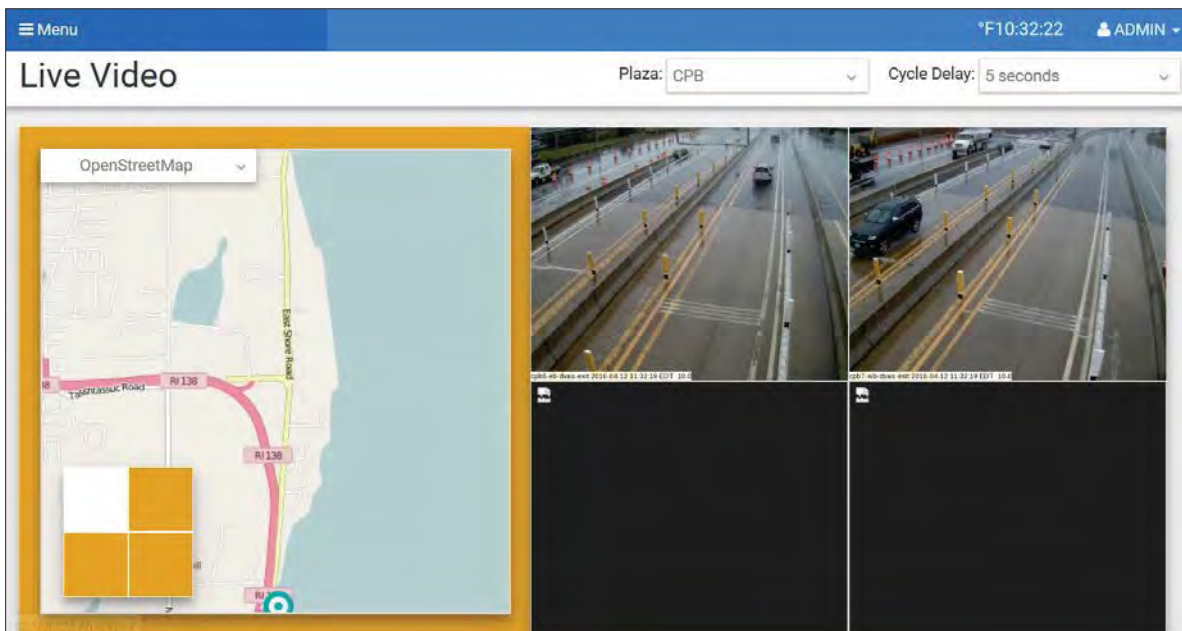


Exhibit 2.5.4-1: ROMS Live Video Screen

## 2.5.5 Live Transactions

The Live Transactions screen provides a near real-time representation of transactional data from the selected location.

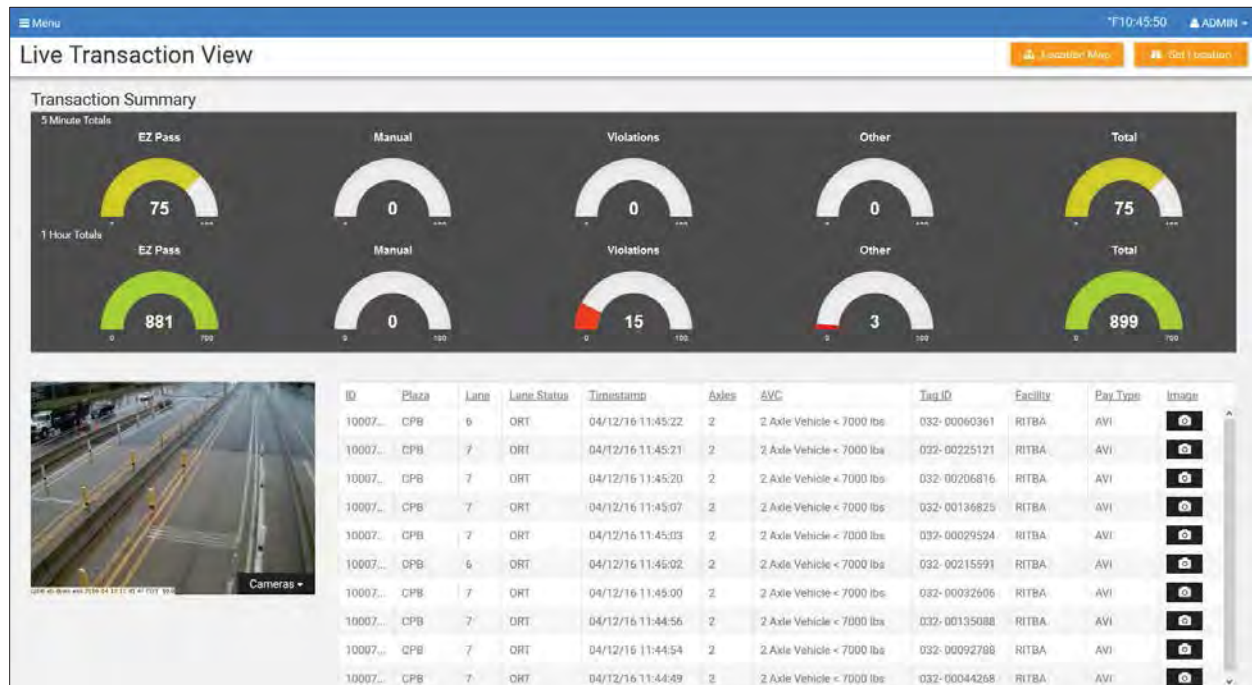


Exhibit 2.5.5-1: ROMS Live Transaction Screen

## 2.5.6 Maintenance Reports

The Maintenance Reports screen contains different reports used to show the past status of the roadway. Once the report and appropriate selection criteria are selected, users can preview the report output or generate either a PDF or Excel-readable Comma Separated Value (CSV) version of the report.

The following is a list of currently implemented reports:

1. **Downtime Analysis Report** - Provides each location ID's "up time" and "down time." It also describes the allowable down time for a selected date-time range.
2. **Failure Statistics Report** - Provides a statistical breakdown of devices and components.
3. **Failure Summary Report** - Provides a summary of the failures and their corresponding severity levels during a specified date range.
4. **Inventory History Report** - Provides a historical view of all inventory such as a device moving from installed to in repair.
5. **Inventory Summary Report** - Provides an easy to read description of the items or components in inventory.
6. **Lane Performance Report** - Provides each plaza's up time and down time. It also describes the allowable down time for a selected date-time range.
7. **Maintenance Detail Report** - Provides a detailed look at the tickets for a specific location during a given date-time range.

8. **Maintenance Summary Report** - Provides an overall look at the tickets for a specific location during a given date-time range.
9. **Technician Logs Report** - Provides an individual technician's logs.

**Down Time Analysis Report**

Location Name	Up Time	Down Time	Location Path
CPB Plaza	40 Days, 4 Hours, 6 Minutes	1 Days, 18 Hours, 54 Minutes	\\Pell Bridge Facility\CPB
CPB EB DVR	0 Days, -1 Hours, 0 Minutes	42 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB EB DVR
CPB WB DVR	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB DVR
CPB WB Zone ORT	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB Lane7 Zone
CPB7-WB-HCS1	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB Lane7 Zone
CPB7-WB-HCS2	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB Lane7 Zone
CPB7-WB-IMAGE-DIST1	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB Lane7 Zone
CPB7-WB-IMAGE-DIST2	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB Lane7 Zone
CPB7 DVAS EXIT	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB Lane7 Zone\CPB7 DVAS EXIT
Janus Reader 1	41 Days, 23 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\Pell Bridge Facility\CPB \CPB WB Lane7 Zone\Janus Reader 1

**Exhibit 2.5.6-1: ROMS Maintenance Reports Screen**

### 2.5.7 Plaza Live Transactions

The Plaza Live Transactions screen is responsible for displaying the most recent transaction, current operator, and current operation mode for each lane. The information is broken down by plaza and lane and will update periodically on its own. This screen gives a quick status check for each lane to make sure they are operating as expected.

Plaza	Lane Number	Status	Mode Status	Operation Mode	Last Transaction	Previous Transaction	Collector	Actions
CPB	6	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	1	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	2	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	3	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	4	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	9	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	10	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	11	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	12	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
CPB	7	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]
Remove from system	6	●	-	-	waiting for SP	waiting for SP	waiting for SP	[Icons]

**Exhibit 2.5.7-1: Plaza Live Transactions Screen**



### 2.5.8 Preventative Maintenance

The Preventative Maintenance screen gives the ability to create and manage recurring tasks that need to occur within normal maintenance operations. The user is able to create a task, specifying the first run time, and how often it will reoccur after that. These tasks can be deployed as a ticket (requiring acknowledgement and resolution of completion), or as just an alert. The tasks can be edited to change all of the relevant information or recurrence frequency as needed.

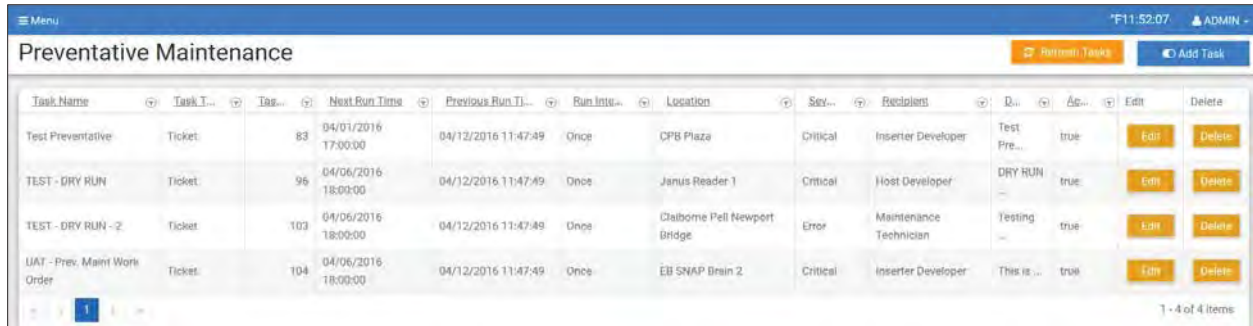


Exhibit 2.5.8-1: Preventative Maintenance Screen

### 2.5.9 Service Issues

The Service Issues screen displays service tickets that require the attention of the maintenance team. This feature allows the user to update and modify tickets as well as manually create new tickets. Users can track outstanding issues through this screen.

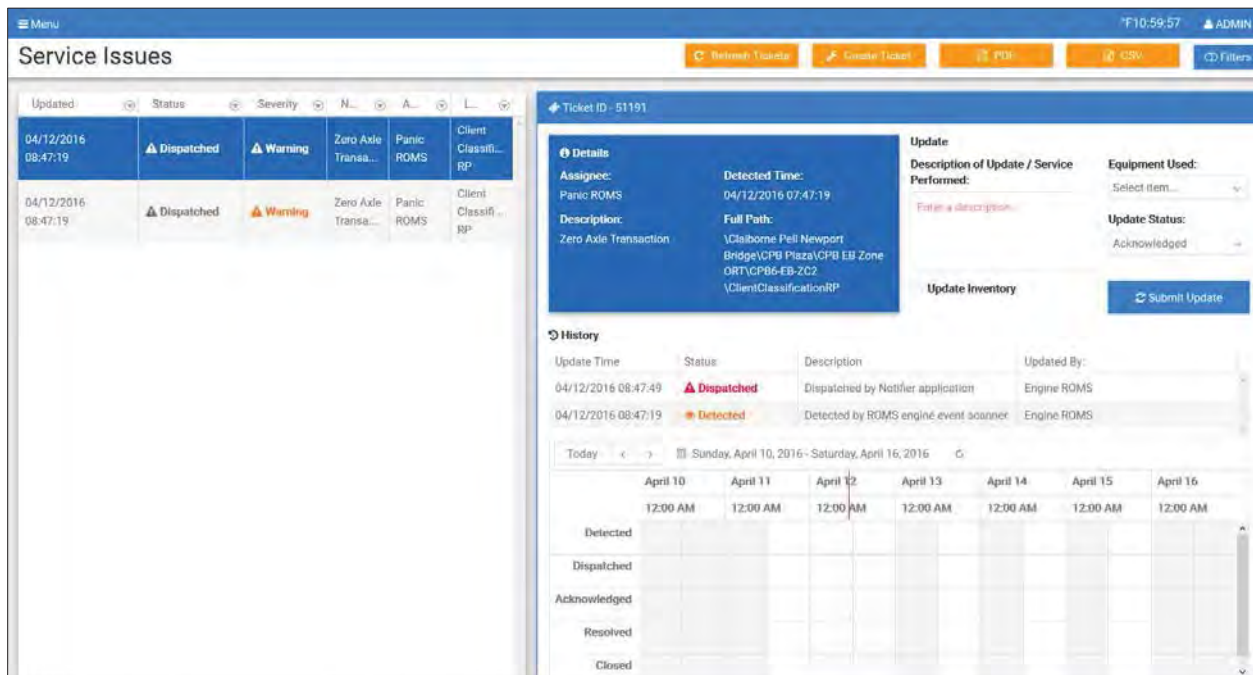


Exhibit 2.5.9-1: ROMS Service Issues Screen

### 2.5.10 Server Logs

The Server Logs screen allows the viewing of the server logs without actually having to remote into each individual server. This screen allows the maintenance team to diagnose a problem remotely without needing to know administrative users or passwords on the server.

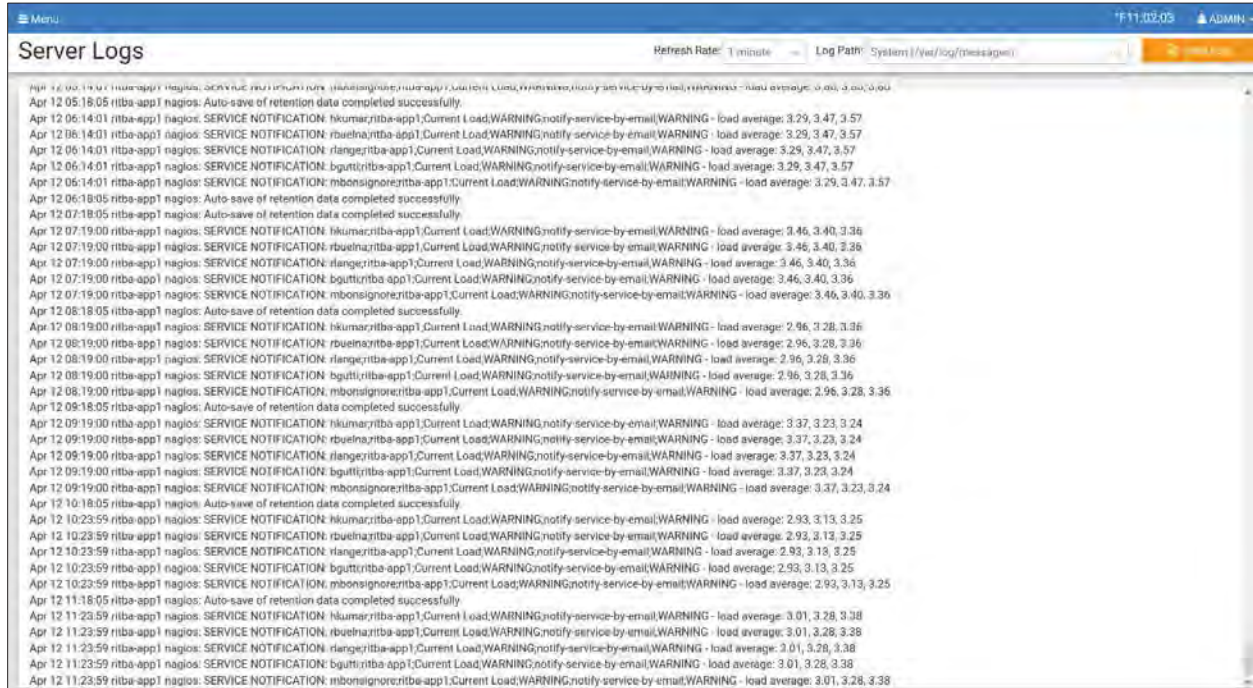


Exhibit 2.5.10-1: ROMS Server Logs Screen

### 2.5.11 System Status

The System Status screen provides a real-time health status of all Internet Protocol (IP) based devices in the system. This screen reports on the overall status of the tolling network and the condition of every connected IP based device. Ping and other checks are continuously completed across the system with the results reported on this screen by device. Detailed information includes the nature of the failure, time the device was checked, and duration of uptime or downtime. Most of the network checks reported here are also linked to ROMS detectors and will generate maintenance tickets for outages.

**System Status**

Current Network Status  
 Last Updated: Tue Apr 12 12:03:07 EDT 2016  
 Updated every 30 seconds  
 Network Core™ 4.6.8 - www.nagios.org  
 Logged in as nagiosadmin

Host Status Totals  
 Up: 0, Down: 0, Unreachable: 0, Pending: 0  
 All Problems: 0, All Types: 0

Service Status Totals  
 OK: 1, Warning: 0, Unknown: 0, Critical: 0, Pending: 0  
 All Problems: 1, All Types: 0

Host Status Details For All Host Groups

Host	Status	Last Check	Duration	Status Information
1001	UP	04-12-2016 11:59:48	16d 20h 57m 33s	RRD OK - Packet loss = 2%, RTT = 0.22 ms
1001-AB-3001	UP	04-12-2016 12:00:01	16d 20h 57m 48s	RRD OK - Packet loss = 2%, RTT = 0.17 ms
1001-AB-3001-1	UP	04-12-2016 12:00:07	16d 20h 57m 7s	RRD OK - Packet loss = 2%, RTT = 0.13 ms
1001-AB-3001-2	UP	04-12-2016 12:00:38	4d 0h 4m 18s	RRD OK - Packet loss = 2%, RTT = 0.30 ms
1001-AB-3001-3	UP	04-12-2016 12:02:08	4d 0h 15m 32s	RRD OK - Packet loss = 2%, RTT = 0.22 ms
1001-AB-3001-4	UP	04-12-2016 12:02:32	4d 0h 15m 56s	RRD OK - Packet loss = 2%, RTT = 0.22 ms
1001-AB-3001-5	UP	04-12-2016 12:03:03	4d 0h 16m 20s	RRD OK - Packet loss = 2%, RTT = 0.52 ms
1001-AB-3001-6	UP	04-12-2016 12:03:34	4d 0h 16m 54s	RRD OK - Packet loss = 2%, RTT = 0.21 ms
1001-AB-3001-7	UP	04-12-2016 12:04:05	4d 0h 17m 18s	RRD OK - Packet loss = 2%, RTT = 0.27 ms
1001-AB-3001-8	UP	04-12-2016 12:04:37	4d 0h 17m 42s	RRD OK - Packet loss = 2%, RTT = 0.43 ms
1001-AB-3001-9	UP	04-12-2016 12:05:07	4d 0h 18m 6s	RRD OK - Packet loss = 2%, RTT = 0.47 ms
1001-AB-3001-10	UP	04-12-2016 12:05:39	4d 0h 18m 30s	RRD OK - Packet loss = 2%, RTT = 0.43 ms
1001-AB-3001-11	UP	04-12-2016 12:06:11	4d 0h 18m 54s	RRD OK - Packet loss = 2%, RTT = 0.71 ms
1001-AB-3001-12	UP	04-12-2016 12:06:43	4d 0h 19m 18s	RRD OK - Packet loss = 2%, RTT = 0.92 ms
1001-AB-3001-13	UP	04-12-2016 12:07:15	4d 0h 19m 42s	RRD OK - Packet loss = 2%, RTT = 0.85 ms

Exhibit 2.5.11-1: ROMS System Status Screen

### 2.5.12 Technician Checklist

The Technician Checklist screen is used by a hardware technician to complete a daily routine checklist of the laneside equipment. The technician uses this screen to notify the user that all components are operational or that they are degraded. If the component is degraded, he or she would state the issue.

**Technician Checklist**

Lane	AVC Light Cu...	AVI Over Hea...	AVI Reader	Entry Eye	Flat Panel To...	Gate	Height Detec...	Loop Detector	PLC	Receipt Printer	Traffic Light	Treadle 1	Treadle 2
Lane 6 (4)	No issues to report.	No issues to report.	No issues to report.	No issues to report.	-	No issues to report.	No issues to report.	No issues to report.	No issues to report.	-	-	No issues to report.	No issues to report.
Lane 1 (308)	No issues to report.	-	No issues to report.	-	-	No issues to report.	-	-	No issues to report.	-	-	No issues to report.	No issues to report.
Lane 2 (508)	-	-	-	-	-	-	-	-	-	-	-	-	-
Lane 3 (509)	-	-	-	-	-	-	-	-	-	-	-	-	-
Lane 4 (510)	-	-	-	-	-	-	-	-	-	-	-	-	-
Lane 9 (512)	-	-	-	-	-	-	-	-	-	-	-	-	-
Lane 10 (513)	-	-	-	-	-	-	-	-	-	-	-	-	-
Lane 11 (514)	-	-	-	-	-	-	-	-	-	-	-	-	-
Lane 12 (515)	-	-	-	-	-	-	-	-	-	-	-	-	-
Lane 7 (561)	-	-	-	No issues to report.	No issues to report.	No issues to report.	No issues to report.	No issues to report.	No issues to report.	No issues to report.	No issues to report.	No issues to report.	No issues to report.
Lane 6 (920)	-	-	-	-	-	-	-	-	-	-	-	-	-

Exhibit 2.5.12-1: ROMS Technician Checklist Screen

### 2.5.13 Technician Logs

The Technician Logs screen is a management feature used to display technician checklists and timestamp entries. A technician would log his or her hours towards a ticket, and the user of the technician logs feature would view the progress of each ticket and log entry, including notes and details for each entry.

Technician	Date/Time	Duration	Category
Mark Moser	05/02/2016 13:00:00	0 days, 00:15:00	Project Manager Concern
Ricardo Buelna	02/18/2016 13:33:27	0 days, 00:01:00	System Maintenance
Ricardo Buelna	02/18/2016 13:00:00	1 days, 00:00:00	System Maintenance
Randy Herrell	02/17/2016 13:00:00	2 days, 01:15:00	Project Manager Concern
Tom Gable	02/10/2016 13:00:00	1 days, 00:45:00	Project Manager Concern
Jerry Risk	02/10/2016 13:00:00	1 days, 00:45:00	Project Manager Concern
System Admin	02/09/2016 13:00:00	1 days, 00:30:00	Project Manager Concern
McTestySon McTestySon	02/08/2016 13:00:00	1 days, 00:30:00	Project Manager Concern
Tom Gable	02/08/2016 13:00:00	1 days, 01:00:00	Project Manager Concern
McTestySon McTestySon	02/05/2016 13:00:00	1 days, 00:15:00	Project Manager Concern
McTestySon McTestySon	02/04/2016 13:00:00	1 days, 00:45:00	Project Manager Concern
Ricardo Buelna	02/04/2016 13:00:00	1 days, 23:45:00	Project Manager Concern
McTestySon McTestySon	02/03/2016 13:00:00	1 days, 00:00:00	Project Manager Concern
McTestySon McTestySon	02/02/2016 13:00:00	5 days, 01:00:00	Project Manager Concern

Exhibit 2.5.13-1: ROMS Technician Log Screen

### 2.5.14 Technician Schedule

The Technician Schedule screen is used by the supervisor to assign a technician to the schedule. Once on a schedule, the technician will receive alerts directly to their email. These alerts notify the technician of any open issues. The supervisor is also allowed to assign technicians to certain roles and zones. These roles and zones dictate which type of tickets they receive.

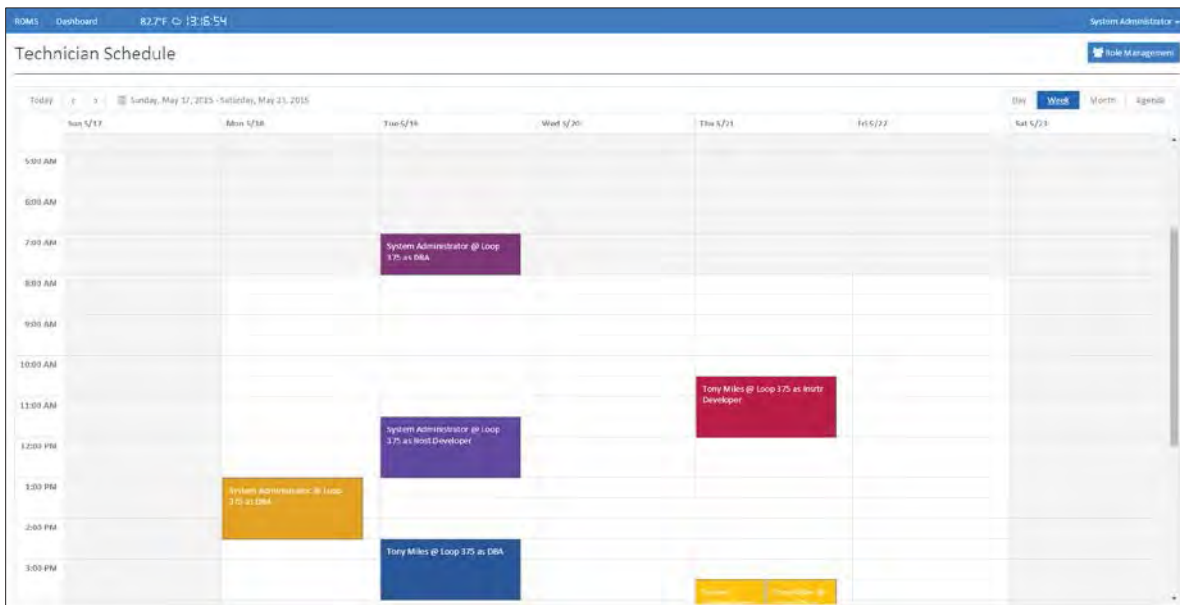


Exhibit 2.5.14-1: ROMS Technician Schedule Screen

### 2.5.15 Zone Historic View

The Zone Historic screen is used to show past transactional data. The screen displays the transaction, diagnostic messages, raw events, and historical video from the location and timestamp that was selected by the user.

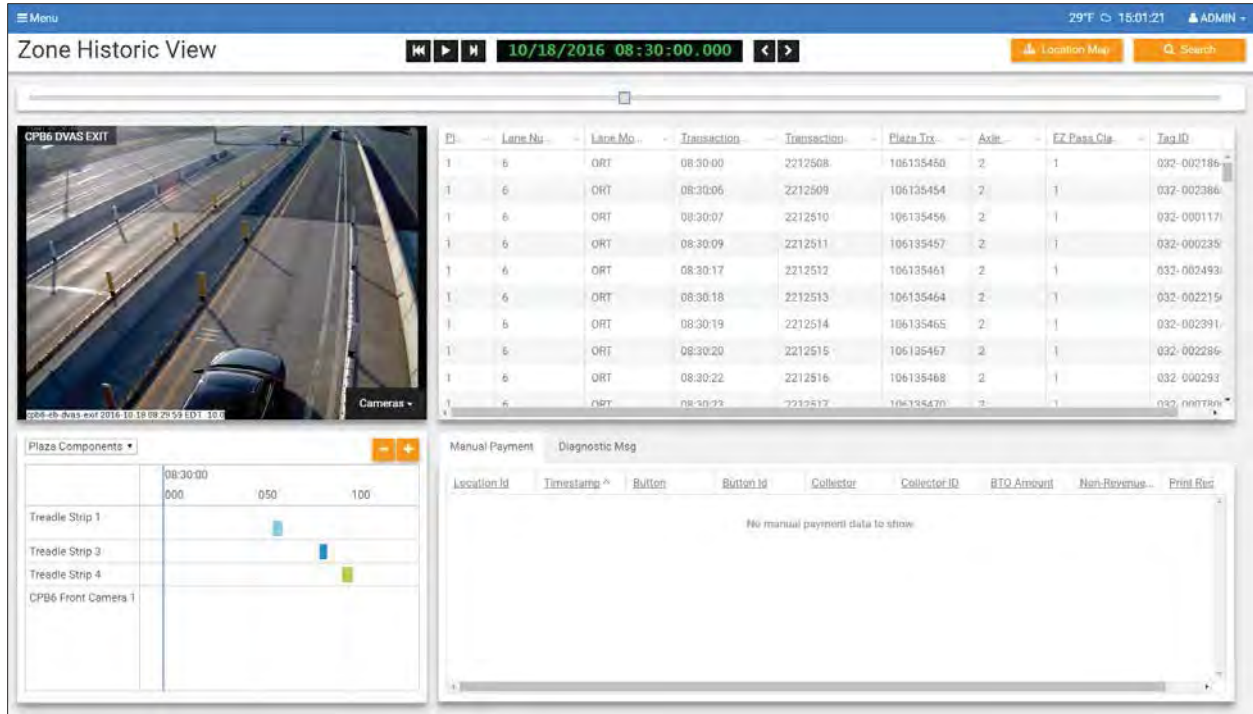


Exhibit 2.5.15-1: ROMS Zone Historic View Screen

### 3 Host Reports Login

The Host Reports application is accessed via a web browser launched through a secure connection. Authorized users at GGB can reach the Host Reports login from any workstation by launching the Host Reports desktop icon.

To login to the Host Reports:

1. Click the Host Reports desktop icon. The Host Reports Login screen opens.

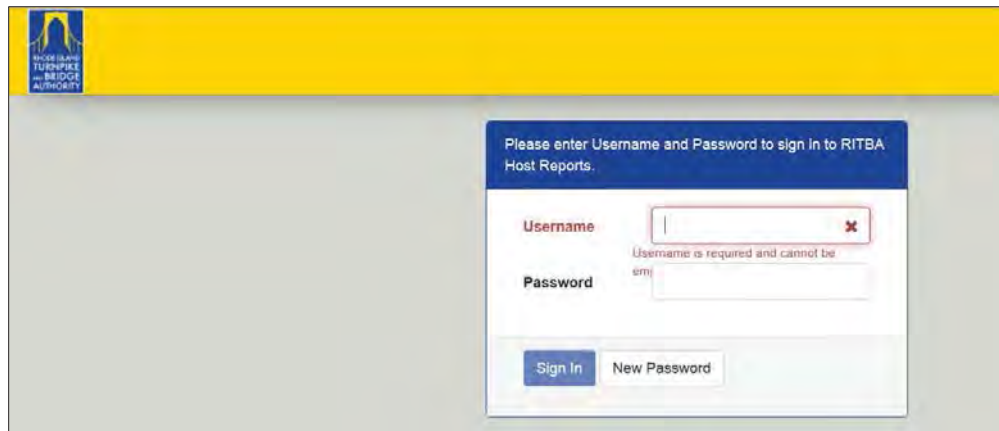


Exhibit 3-1: Host Reports Login Screen

2. On the Login Screen, enter User and Password information, and then click Login. To update or change password information, click Change Password. The Host Reports home screen opens.

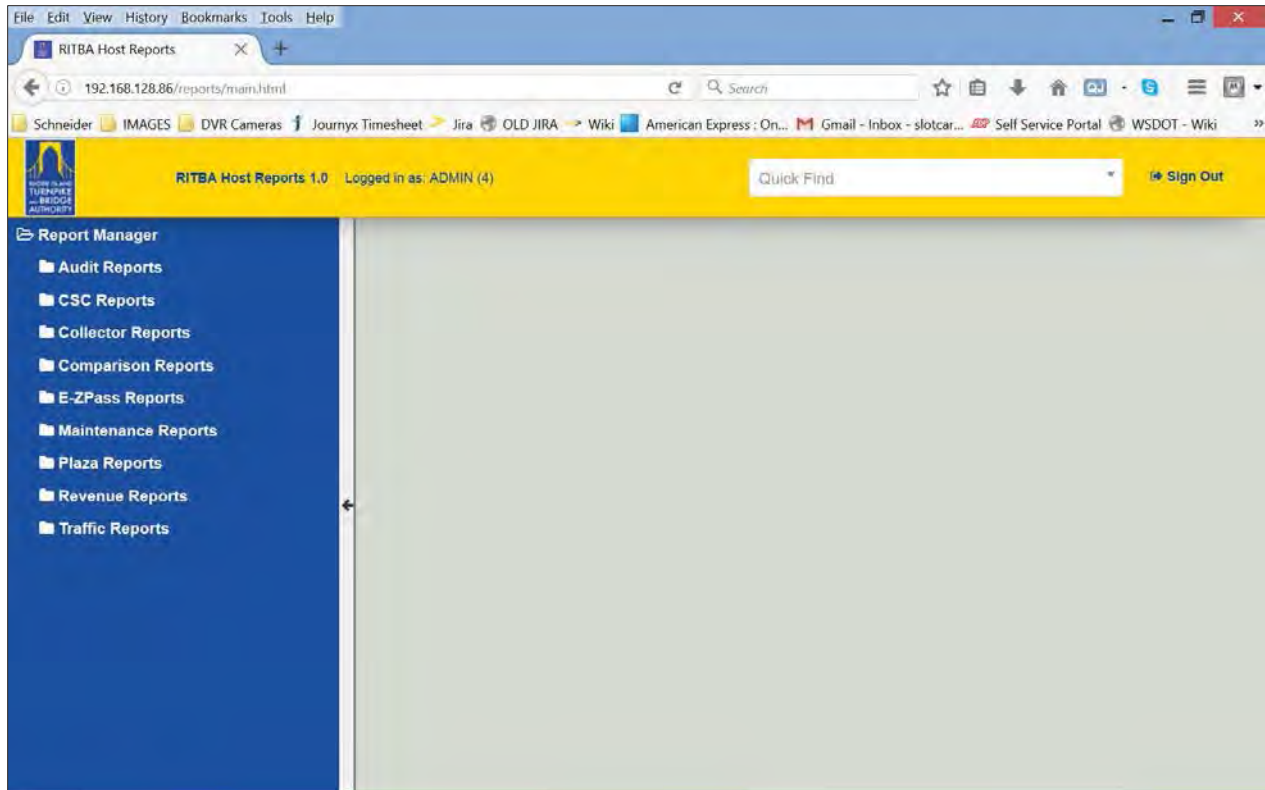


Exhibit 3-2: Host Reports Home Screen

### 3.1 Maintenance Reports Screen

The Maintenance Reports screen of the Host Reports is used to access the ROMS maintenance data-related reports. This screen allows the user to select an individual report, and it automatically provides report-specific criteria based upon the selection. Once the report and appropriate selection criteria are selected, users can preview the report results or select either a PDF or Excel-readable Comma Separated Value (CSV) version of the report.

The Maintenance Reports screen is used to generate the following reports:

- Down Time Analysis
- Failure Statistics
- Failure Summary
- Inventory History
- Inventory Summary
- Lane Performance
- Maintenance Detail
- Maintenance Summary
- Technician Logs

## 4 Equipment Repair

Standard repair procedures are documented and cross-referenced via the troubleshooting procedures in ROMS. Equipment repair procedures include a required parts list, tools list, notifications list (key people to notify of a particular repair whose work may be affected due to the repair), and photographs (as necessary and appropriate) to show the location of key parts and estimated time to repair.

The technicians continuously provide feedback on all requirements so that the estimated time-to-repair can be constantly revised. Additionally, many of these functions are automated using ROMS. Warranted equipment will be repaired using to the manufacturer's repair procedures and standards. Information regarding ROMS processes and procedures specific to equipment repair can be found in the Operations Manual.

Issues are escalated to outside vendors (third party maintenance) only if resolution cannot be reached by internal means first. If an issue is deemed irreparable it is escalated to top-level, at which point the vendor is contacted for further input.

#### 4.1 Spares

All currently installed and spare equipment inventory is held within the ROMS Inventory tab. All spare equipment is available to be installed and is held in the GGB equipment building. Inventory within ROMS is updated to reflect current inventory levels. If equipment fails, it will be noted within ROMS and moved to an installed state. All equipment sent in to be repaired will also be tracked using the Inventory tab in ROMS.

#### 4.2 Lane Closures

Lane closures will be handled through GGB and its approved subcontractors.

#### 4.3 Preventative and Predictive Maintenance

ROMS is used as a primary preventative maintenance tool. Scheduled preventative maintenance actions are entered into ROMS as scheduled work orders that are automatically dispatched to the technician on duty at the appropriate time.

**Exhibit 4.3-1: Preventative and Predictive Maintenance**

Preventative Maintenance Item	Description
(semi-annually)	Cleaning, aligning, adjusting, tuning, tightening, and replacing wearable elements for all gantry mounted equipment, and completing a full inspection of the roadway loops.
System process checks (daily)	The technician reviews all daily processes for completion, including axle counts, images, tag reads, and running in degraded mode.
System function checks (daily)	The technician reviews a sampling of transactions from both ORT zones and camera images from all lanes and for night and day conditions.
System physical inspection (when on-site)	The technician opens and inspects all cabinets and racks for equipment status, reviews status indicators on components, cleans locations as necessary, confirms proper power and cabling connections to all locations, and ensures all locations are secured prior to departure from site.

Over time, repair and replacement of system components begin to build an accurate database in ROMS, which is the basis of predictive maintenance. Information regarding ROMS processes and procedures specific to preventative maintenance can be found in the Operations Manual.

Predictive Maintenance is the use of past performance data to predict a failure time, to inspect, or replace an item prior to its expected failure. While this can be based on manufacturer-listed Mean Time Between Failures (MTBF), this data is often developed in a sterile lab environment and may not reflect how the component performs in a real-life environment, especially one as harsh as the toll environment. Kapsch uses manufacturer MTBF as one of the data points.

Technicians are required to inspect a part and check or test for performance or wear issues at preset intervals as predictive failure rates are refined. This is especially important for consumables such as light bulbs. Predictive maintenance is most accurate when field failure rates are recorded and analyzed over a few replacement cycles.

Once the repair cycle begins, predictive assumptions are made based on the following:

- Rate of failure
- Manufacturer recommendations
- Rated MTBF
- Number of cycles performed

#### 4.3.1 Duration Expiration

Prior to a device's expected failure date a ticket is opened by the ROMS, and the appropriate technician is dispatched and instructed to inspect, repair, or replace the listed device. The time of the requested action to repair or replace a particular device or part and the action requested is logged by ROMS.

ROMS prompts the technician until such time that the scheduled preventative maintenance ticket is closed out. If an action is not completed, the preventative maintenance task is reported as an unclosed trouble ticket item.

#### 4.3.2 Corrective Maintenance

ROMS pages and dispatches each technician to perform the daily checklist. These daily checklists allow the technician to maintain the health of the system by correcting any issues that are not generated through a ROMS ticket. ROMS logs the page and response time each day for the checklists and provides documentation of the daily checklist performance. Monitoring is performed by the GGB Maintenance Team in adherence to the following standards:

- Images are checked three times a day:
  - In the event that a camera is producing substandard quality images, the technician will work on the camera remotely until the issue is corrected.
  - If the issue cannot be resolved, Tech Support can be called for help.
- ROMS tickets are received continuously (24/7):
  - All issues are worked remotely.
  - If an issue cannot be resolved, the Local Tech Support is called to the site.
- ROMS is monitored proactively during normal business hours to catch any potential issues:
  - All issues are worked remotely.
  - If an issue cannot be resolved, the Local Tech Support is called to the site.

#### 4.3.3 Semi-Annual Preventative Maintenance

Semi-annual Preventative Maintenance (PM) may be performed by GGB employees using the checklist in Appendix B.

#### 4.3.4 Technical Support Protocol

Staff technical training includes how to perform maintenance tasks and the process for escalation of more challenging tasks or system issues. Training is provided in the following formats:

- Local on-site training during installation
- Ongoing on-site training through On-The-Job Training (OJT) and Original Equipment Manufacturer (OEM)
- Continuous daily training for issue resolution to ensure efficiency
- Localized training for all maintenance based applications
- Continuous training for all new products



## 4.4 Inventory Management

ROMS is the primary inventory management tool, tracking all inventory as well as fielded equipment. Formal procedures are used to ensure inventory movement among lanes and are automated using ROMS. Information regarding ROMS processes and procedures specific to inventory management can be found in the Operations Manual.

### 4.4.1 Subsystems Escalation Contacts

See Appendix A for detailed information on subsystem escalation contacts.

## 5 Disaster Recovery Plan

For definition purposes related to this document, a disaster is considered any incident or event that results in a major (multi-hour or day) interruption of operations at one of the GGB system sites: Fire, flood, natural disaster, or any other activity in which only a portion of systems or operations at any one location is affected, and a subset of the full recovery procedures will likely be used to restore normal operations.

A catastrophic disaster, however, would be an event that renders all systems supported by Kapsch incapable of conducting critical functions for an extended period of time and is beyond the scope of this document.

Additionally, this document does not cover plaza/lane “construction-style” disasters (such as a plaza sustaining major structural damage) that would require reconstruction or rebuilding of the road or plaza/lane components. Only system sites and data recovery aspects are addressed by this plan.

The major goals of the Disaster Recovery Plan are to:

- Minimize interruptions to normal operations
- Limit the extent of disruption and damage
- Minimize the economic impact of the interruption
- Establish alternative means of operation in advance of an interruption
- Train personnel on emergency procedures
- Provide for smooth and rapid restoration of service

## 6 Organization and Positions

The Kapsch Maintenance Department consists of three groups of people: The Maintenance Manager, Software Support Team, and the System Administrator/Network Engineer.

### 6.1 Maintenance Manager

The Kapsch Maintenance Manager is responsible for the contract, project, and day-to-day software operations of the project. While the Project Manager functions as the primary point of customer contact, Kapsch does not restrict customer contact to any of our staff members, and the Maintenance Manager has full autonomy in the performance of his duties. The Maintenance Manager ensures that all the requirements of the contract are met and that the performance of the Kapsch team continually meets and exceeds GGB's expectations. The Maintenance Manager works primarily during normal business hours but will share after hours on-call duty with the Deputy Project Manager for issues that escalate above the Lead Technician.

### 6.2 Software Support Team

The primary responsibilities of the Software Team are to perform operations as needed, and to respond to trouble calls issued by GGB or Kapsch management. The Software Team is also responsible for all software patches.

### 6.3 System Administrator/Network Engineer

The System Administrator (Sys Admin)/Network Engineer is responsible for maintenance and repair of all Operating System (OS), network, and operating environment issues. The Sys Admin/Network Engineer is based at the Maintenance Service Center (Austin, TX), and deals with day-to-day preventative maintenance issues and provides on-call services for unexpected and catastrophic situations related to the operation of the systems and network.

The day-to-day preventative maintenance tasks the Sys Admin/Network Engineer is responsible for includes:

- Verifying and optimizing OS operating parameters as required
- Monitoring correct operations of system applications
- Monitoring and tuning the database
- Checking OS logs to detect failures and faults with the goal of correcting any errors prior to the problem affecting system performance

The Sys Admin/Network Engineer also has the primary responsibility for management of the system security policy, detecting, and correcting security issues. The Sys Admin/Network Engineer makes periodic recommendations to upgrade the OS on subsystems as appropriate, takes primary responsibility for OS upgrades, and drafts/executes plans to upgrade each system with minimal impact to ongoing operations.

## 7 Coverage

Coverage will be made on a continuous basis through GGB support personnel, available 24/7, Monday-Sunday (including holidays). Kapsch Software Support is available 24/7, 365 days a year, for any and all support GGB may encounter.

## 8 Readers and Antennas

The Kapsch Janus Reader, Automatic Vehicle Identification (AVI) subsystem manages the processing of vehicle to roadside communications in the Open Road Tolling (ORT) zone. The AVI subsystem is designed to read data from and write data to on-board vehicle transponders.

### 8.1 Components

The roadside AVI subsystem is comprised of the AVI reader, the Radio Frequency (RF) Module, and the antenna. One antenna will be installed over the center of each travel lane. This configuration provides full AVI coverage of the travel lanes and the shoulders.



Use or disclosure of the data on this sheet is subject to the restriction on the document title page



Exhibit 8.1-1: AVI Reader, RF Module, and Antenna

The AVI reader unit is comprised of two independent and redundant readers linked in a Primary-Secondary configuration. The Primary unit is comprised of a power supply module, a Central Processing Unit (CPU) board, a RF control board, and two communications boards. It also features a Primary Failsafe Module. The Secondary reader is identical to the Primary unit but features a Secondary Failsafe Module. If the Primary unit fails, the reader automatically fails-over to use the redundant Secondary unit within a few milliseconds.

This redundancy extends to the communication with the Zone Controller (ZC), whereby both Primary and Secondary are physically connected to each Zone Controller. While the two reader halves are referred to as Primary and Secondary, no functionality is removed from the Secondary, and the Primary does not control the Secondary. At any one time, either the Primary or the Secondary is receiving data from the RF modules, but not both at once.

The AVI reader functionality has been enhanced to failover upon detection of a Primary zone controller failure. If Acknowledge (ACK) communication on the Primary reader side fails with the active Zone Controller (e.g., if the zone controller fails), the AVI reader will switch serial communications to the Secondary reader side and the parallel zone controller.

Once the AVI reader has failed-over to the Secondary side there is no redundancy, and the AVI reader must be reset to Primary locally on-site. **Note:** Operation on the Secondary side of the reader without redundancy is not intended for long time periods, however, the Secondary side includes an extended memory module to store tag reads collected by the reader in the event of a second failure on the Secondary Zone Controller. Prior to reset, the technician must first confirm recovery of the Primary Zone Controller (and Secondary side if both zone controllers faulted) and the restoration of Zone Controller communications with the Reader (to ensure that all buffered tag reads are sent to the Host before reset).

After confirming recovery, the technician will address the reset at the reader cabinet located adjacent to the ORT zones at the roadway level. The technician will depress the reset button on the CPU Board for the side being reset and wait for the flashing red/green Light Emitting Diodes (LEDs) to reach steady green. When stable, the technician will check the zone for vehicle traffic, and when the zone is clear, depress the reset button on the Failsafe Module (FSM) Board. After reset, the technician will confirm that the FSM shows a steady green LED active for the Primary side of the reader. After confirming, the technician will depress the CPU Board reset on the Secondary side to ensure the slave side of the reader is cleared and ready for failover. The technician will then confirm transactions in ROMS and close all tickets associated with the reader reset.

## 9 Violation Enforcement System (VES)

The VES cameras are manufactured by Kapsch. These cameras are network based and provide power and triggers to the Strobes. Each camera is monitored by ROMS for network status and if a loss of connectivity is detected, an alert notification is sent to the on-call technician.

### 9.1 Checking VES for Issues

To check for issues with the VES:

- Ping the camera with the issue
- If you can't get into the Camera, try hard rebooting by using the reboot commands in the Zone Controller/Image Capture Server (ZICS)
- You may also use the Snap Opto software to reboot the cameras as they are wired through a relay on the Snap board
- Ping the Camera again and check for images

The iris of each camera is controlled by a light sensor residing inside the camera itself. These devices optimize the iris of the camera by adjusting to ambient light and grey-scale checks on recent images. To check images from the Host:

- Log into the Host and get Images from: Main Menu, Host Reports, Audit Reports
- Check all transactions for images and tag reads

### 9.2 Checking ZICS for Transactions

To make sure that the Apex has started successfully and is running properly, complete the following:

1. Log in
2. `cd to /usr/local/apex`
3. Grep for the Apex processes and look for the process. (`ps aux | grep apex`)

```

172.20.176.100 - PuTTY
login as: root
Using keyboard-interactive authentication.
Password:
Last login: Mon May 7 09:05:15 2012 from 10.129.20.39
NHDOT Northbound Primary Zone Controller
nhham-nb-zc1:~ # cd /usr/local/apex
nhham-nb-zc1:/usr/local/apex # ps aux | grep apex
root      2450  0.0  0.0  2876  1192 ?        S      Feb17   0:00 /bin/sh /usr/local/apex/bin/execute_apex.sh zonectrlr /usr/local/apex/config/NHDOT_NB_ZC1.xml
root      2455 15.1  4.8 492228 99512 ?        S1     Feb17 17374:19 /usr/local/apex/bin/zonectrlr -c /usr/local/apex/config/NHDOT_NB_ZC1.xml
root      32423 0.0  0.0   2324   724 pts/0    S+     09:11   0:00 grep apex
nhham-nb-zc1:/usr/local/apex #

```

Exhibit 9.2-1: Apex Process

4. If you don't see the last part of the third line (ps aux | grep apex) shown above, then start Apex Application. "service apex start"
5. Log into Image Capture Station (ICS), Enter "logs"
6. Enter "cd icsmanager"
7. Enter "tail -f transactionimagemapper\*"
8. You should see transactions coming in like the screen shot below

```

172.20.176.50 - PuTTY
nhham-nb-ics:~ # logs
nhham-nb-ics:/var/log/apex # cd icsmanager
nhham-nb-ics:/var/log/apex/icsmanager # tail -f TransactionImageMapper*
2012-May-07 15:34:46.621802 1180162 ---Notice--- Got a trx with the id of 180022
2012-May-07 15:34:56.624632 1180163 ---Trace--- Found 3 images for trx ID 180022
2012-May-07 15:34:56.624748 1180164 ---Notice--- Got a trx with the id of 338233
2012-May-07 15:34:56.627350 1180165 ---Trace--- Found 3 images for trx ID 338233
2012-May-07 15:35:03.467317 1180166 ---Notice--- Got a trx with the id of 451399
2012-May-07 15:35:13.470113 1180167 ---Trace--- Found 3 images for trx ID 451399
2012-May-07 15:35:33.897127 1180168 ---Notice--- Got a trx with the id of 180023
2012-May-07 15:35:43.899849 1180169 ---Trace--- Found 3 images for trx ID 180023
2012-May-07 15:35:43.899964 1180170 ---Notice--- Got a trx with the id of 338234
2012-May-07 15:35:43.902417 1180171 ---Trace--- Found 3 images for trx ID 338234
2012-May-07 15:36:09.469514 1180172 ---Notice--- Got a trx with the id of 338235
2012-May-07 15:36:19.472350 1180173 ---Trace--- Found 3 images for trx ID 338235
2012-May-07 15:36:19.472468 1180174 ---Notice--- Got a trx with the id of 180024
2012-May-07 15:36:19.475035 1180175 ---Trace--- Found 3 images for trx ID 180024
2012-May-07 15:36:19.475141 1180176 ---Notice--- Got a trx with the id of 769681
2012-May-07 15:36:29.477735 1180177 ---Trace--- Found 3 images for trx ID 769681
2012-May-07 15:36:29.477855 1180178 ---Notice--- Got a trx with the id of 451401
2012-May-07 15:36:29.480401 1180179 ---Trace--- Found 3 images for trx ID 451401
2012-May-07 15:36:30.643251 1180180 ---Notice--- Got a trx with the id of 769681
2012-May-07 15:36:40.645859 1180181 ---Trace--- Found 3 images for trx ID 769681
2012-May-07 15:36:40.646000 1180182 ---Notice--- Got a trx with the id of 451402

```

Exhibit 9.2-2: Example Transactions

The VES ICS network status is monitored by ROMS. Loss of network connection to any ICS generates a ticket that is tracked by ROMS.

## 10 Server Rooms

The server room should be checked daily for Uninterruptible Power Supply (UPS) status, Heating, Ventilation, and Air Conditioning (HVAC) status, and a cursory inspection of the rack components. During these inspections, any environmental issues should be brought to the attention of GGB.

## 11 Software Maintenance

### 11.1 Software Maintenance Plan (SMP)

A Software Maintenance Plan is provided that describes all aspects of preventative and emergency software maintenance for the GGB Toll Collection System. The document describes the software maintenance procedures used by Kapsch in maintenance of the system. The document includes both preventative maintenance procedures, as well as procedures for addressing defects and change requests.

The document also describes procedures used for on-call and emergency support of the system by Kapsch personnel. The procedure details normal and on-call business hours and processes for opening trouble tickets with the Kapsch Help Desk.

Also included in the Software Maintenance Plan is the Software Change Management Procedures to be used with the system. The Software Change Management Procedures include procedures for Change Requests, Revision Management, and Change Management.

### 11.2 Software Help Desk

Kapsch maintains a Software Help Desk, operating 8am to 6pm CT, Monday through Friday. In addition, Kapsch personnel are on call 24 hours per day, 365 days of the year, within a 15-minute response time.

Upon receipt of a call, Kapsch personnel log the call into ROMS, generating a Trouble Ticket. The Trouble Ticket number is provided to the caller. In coordination with the customer, a severity is assigned to the call, ranging from informative to critical. Depending on the severity of the call, the Kapsch Help Desk will attempt to address the problem or escalate the problem to the maintenance developers on staff. The Kapsch Call Logging System is available online to the customer for review or update of the status of the problem.

## 12 ZICS (Lane Controller/ICS Combination)

The ZICS is the system responsible for running all software needed for toll collection. Each ZICS is a clone of an original master ZICS. Configuration files are read and used to run lanes in ORT mode. Because each ZICS is a clone, it is possible to pull a ZICS from any location and swap it into another location. This will remain true as long as the Dongle (unique ID on USB) is installed. Again, any ZICS can be placed anywhere in the GGB Toll System as long as the Dongle is placed correctly.

Every ZICS is built at the Kapsch lab before it is used in the field. Recently purchased ZICSs or ZICS hard drives must be sent through the Kapsch lab before being used. ZICSs all have a tested and documented build procedure that is included in this document. Steps in the install procedure are followed exactly to produce a clone of all the other ZICSs running in the field.

### 12.1 Software

All the software on the ZICS is pre-loaded in the installation procedure and will automatically startup at boot-up. As stated in a previous section of this document all ZICSs are clones of one another. This means that all software on all of the ZICSs is the same. Anything that is added, whether it is software or a configuration file, must be added to the installation procedure to maintain the similarity between ZICSs.

Any problems observed with any of the running software should be brought to the attention of the development staff. Descriptions of running applications throughout this document are included for edification of the maintenance technician. Maintenance technicians should not attempt to "fix" any software related issues. User permissions will prevent a technician from changing files that are not to be changed. Users should also exercise caution when logged into the ZICS.

### **12.1.1 System Boot Process**

The system boot process includes setting the hostname and IP address for the primary and secondary NIC's, loading all port drivers, and starting the Apex startup application. This process will take up to 30 seconds. During boot-up startup messages will display any connections to the Video Graphics Array (VGA) port. A system reboot will always bring the system up to its "normal" state.

### **12.1.2 IP Address and Hostname**

Upon system boot the first user level script that is called up is the Dongle script. The Dongle script will set the primary and secondary IP address, the system hostname, and set the system host's file.

The primary ZICS IP address is set by setting the first two octets of the IP address. By convention, the third octet is always set to the plaza ID. The fourth octet of the IP address is set to the device being operated.

### **12.1.3 Apex**

The main application that runs on the system is called Apex. This is the main ZICS application and if it is not running, normal toll collection is not operable.

#### **12.1.3.1 Apex Startup**

Apex is started using "service apex start" script. This script is necessary to set up everything needed to run the application. After Apex is started, the application should be completely up and running about 30 seconds later. Following a reboot, it may take Apex upwards of 60 seconds to be up and running again.

When application startup is complete, it is necessary to access the ZICS via the Keyboard, Video, and Mouse (KVM) or to access it remotely via ssh to manually verify startup. In either case to verify the ZICS is running, it is best to use the Maintenance Menu described in the Maintenance Menu section of this document.

## **12.2 Maintenance Menu**

The Maintenance Menu is an application that can be accessed via PuTTY on the application server. This menu will give access to all of the different lane side servers and offers the ability to view transactions, view errors, restart process, and more. Details of the uses of the Maintenance Menu can be seen in Appendix F. Kapsch will provide training to GGB personnel on how to use this menu via WebEx.



## Appendix A Subsystem Escalation Contacts

### Exhibit A-1: Subsystem Escalation Contacts

Contact Name	Title	Contact Information
<b>Kapsch</b>		
Daniel Lafuente	Maintenance Manager	Daniel.Lafuente@kapsch.net
Mark Moser	Maintenance Operations Director	Mark.Moser@kapsch.net
Tony Marty	Project Manager	Tony.Marty@kapsch.net

## Appendix B Semi-Annual Preventative Maintenance Checks

### Exhibit B-1: Semi-Annual Preventative Maintenance Checks

Site Name:					
ANTENNA	LN 1	LN 2	Initials	Date	Notes:
U-Bolt Mounts Tight					
Angle Adjustment					
Coax Tight and Sealed					
Measurement from lowest point of antenna to roadway					

## Appendix C Weekly Checks

Toll Zone: \_\_\_\_\_

### Visual Inspection of all Overhead Equipment:

Visually inspect from the side of the road for anything out of order, including:

- Exposed cabling
- Loops in the roadway
- Antennas

#### Exhibit C-1: Overhead Equipment Inspection

Lane	Signature	Date	Comments:
1			
2			
3			

### Visual Inspection of all Overhead Structures:

Visually inspect equipment supports and hangers from the side of the road for anything out of order, specifically moisture and corrosion damage.

#### Exhibit C-2: Overhead Structure Inspection

Lane	Signature	Date	Comments:
1			
2			
3			

### Visual Inspection of Interior and Exterior of Reader Cabinet:

- Visually inspect cabinet for anything out of order
- Verify that all connections are in place and tight
- Visually inspect for any error lights or beeping noises

#### Exhibit C-3: Interior and Exterior Reader Cabinet Inspection

Lane	Signature	Date	Comments:
1			
2			
3			

**Visual Inspection of Interior and Exterior of Roadside Cabinet:**

- Visually inspect cabinet for anything out of order
- Verify that all connections are in place and tight
- Visually inspect for any error lights or beeping noises

**Exhibit C-4: Interior and Exterior Roadside Cabinet Inspection**

Lane	Signature	Date	Comments:
1			
2			
3			

**Visual Inspection of Loops:**

Visually inspect from the side of the road for anything out of order, including:

- Loops
- Versa-flex degradation

**Exhibit C-5: Loop Inspection**

Lane	Signature	Date	Comments:
1			
2			
3			

**Notes:**

Pictures to be attached if needed.

# Appendix D MTBFs

Exhibit D-1: MTBFs

Manufacturer	Component	Model Number	AC/ DC	Minimum Input Voltage (volts)	Maximum Input Voltage (volts)	Operating Temp (F)	Operating Temp (C)	MTBF (hours)
<b>OVERHEAD EQUIPMENT</b>								
<b>CABINET EQUIPMENT</b>								

## Appendix E Sample ITB 1

ITB TYPE: Snap Opto Procedures

DATED: 01/26/2016

ORIGINATOR: Mike Wedgworth

### Title: Using PAC Manager

#### Items needed:

- Laptop computer
- Cat-5 cable
- PAC Manager Software
- Make sure you have the current version of PAC Manager
- [http://www.opto22.com/site/downloads/dl\\_downloads.aspx?cid=4](http://www.opto22.com/site/downloads/dl_downloads.aspx?cid=4)

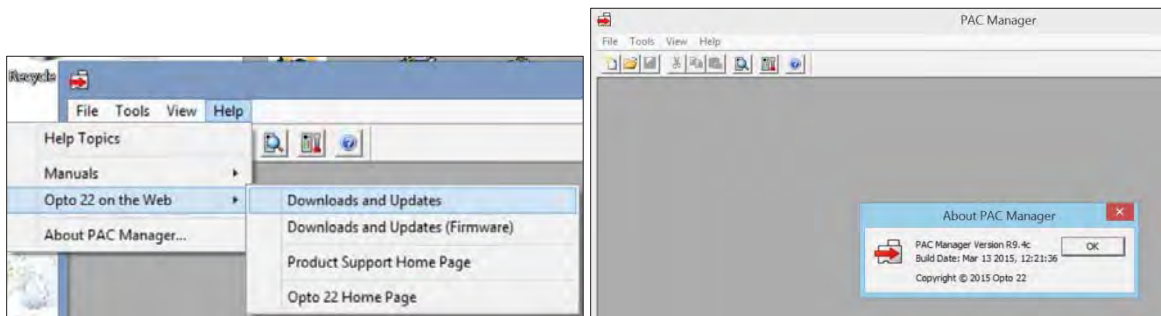


Exhibit E-1: PAC Manager Software

1. To get started with a Snap Brain, click on “find” after you have connected a Cat-5 cable from your laptop to the Snap Brain.

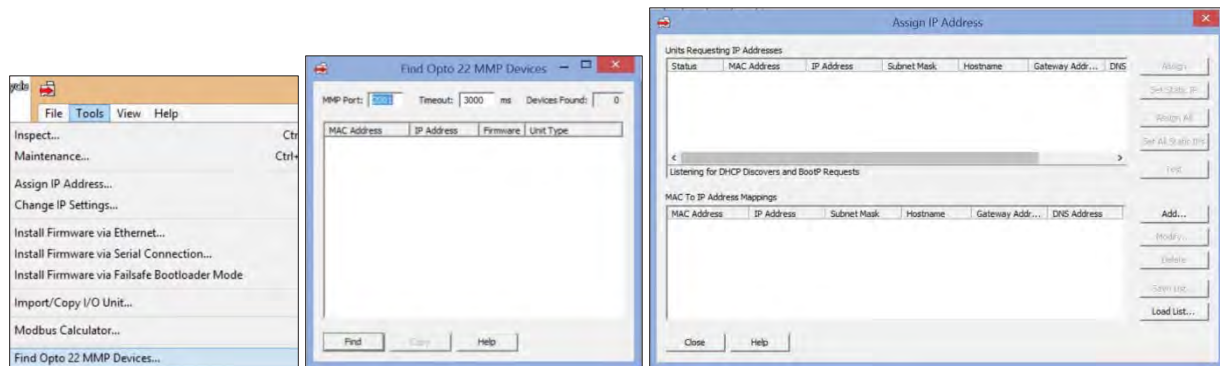
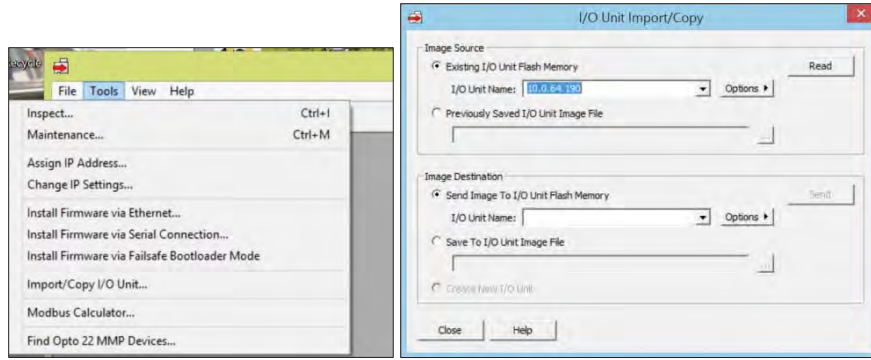


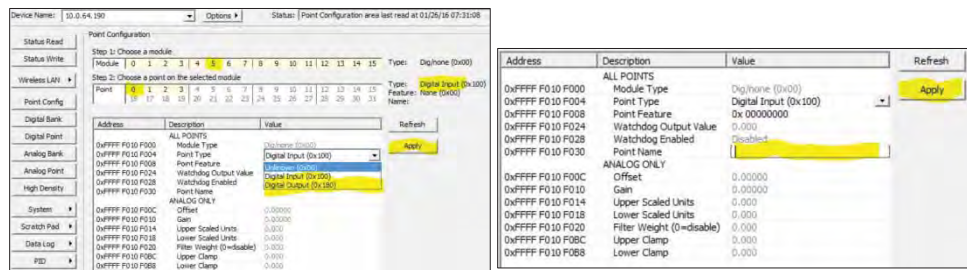
Exhibit E-2: Assign IP Address

2. Now assign an IP address to this device.
3. Import a config on the device. If you have the exact config for where it is going, then import that one. If not, import from another device that has the same Idris/Treadles that you are in need of (This would be for install only.).



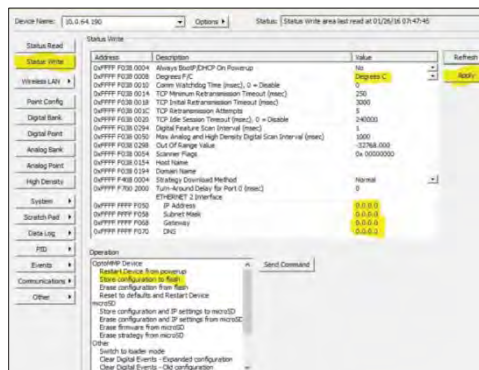
**Exhibit E-3: I/O Unit Import/Copy**

4. Input the “image source,” and then read it. Input “image destination,” and then send it.
5. The software will handle the inputs on the Snap config. Once they are done, you can set up the outputs used for remote reboot of devices.
6. Snaps are configured using 0,1,2,3. Find the module you want to configure. Change it to an output, and input a name to the point you are on. Here, we are on module 5, point 0. Once you make the change to output, all points on that module will change to output. Name all points you are using.



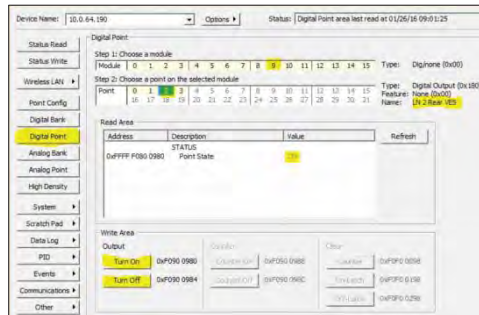
**Exhibit E-4: Configure Snaps**

7. Finalize the Snap configs. Go to “status write” and make any changes needed here. Then “store configuration to flash.” If you do not store the configuration to flash, then all will be lost upon power loss.



**Exhibit E-5: Finalize Snap Configs**

8. If you need to reboot/power cycle a device that is on the output modules, scroll to the module and point where the device is located.
  - Click on tools > double click Inspect.
  - A screen should show as follows.
  - Once this screen has appeared, type in the desired device IP using the IP address example 10.0.xx.xx
  - Next click on the “Digital Point” button.



**Exhibit E-6: Reboot/Power Cycle a Device**

9. We wire the modules in a normally closed manner. Meaning, when the device is powered on, the “status value” will be “OFF.”
  - Run a constant ping on the device you wish to reboot.
  - To reboot the device, “turn on” the output in the “write area” for 5-10 seconds, then turn it back off.
  - Verify the device has come up with the constant ping. Then, log into the Host and check transactions. Check Nagios. Log into the device and verify all is working correctly.

## Appendix F Sample ITB 2

**ITB TYPE: PROCEDURES**

**DATED: 4/13/2015**

**ORIGINATOR: Mike Wedgworth**

### **Title: How to Use the Maint Menu on the ZC**

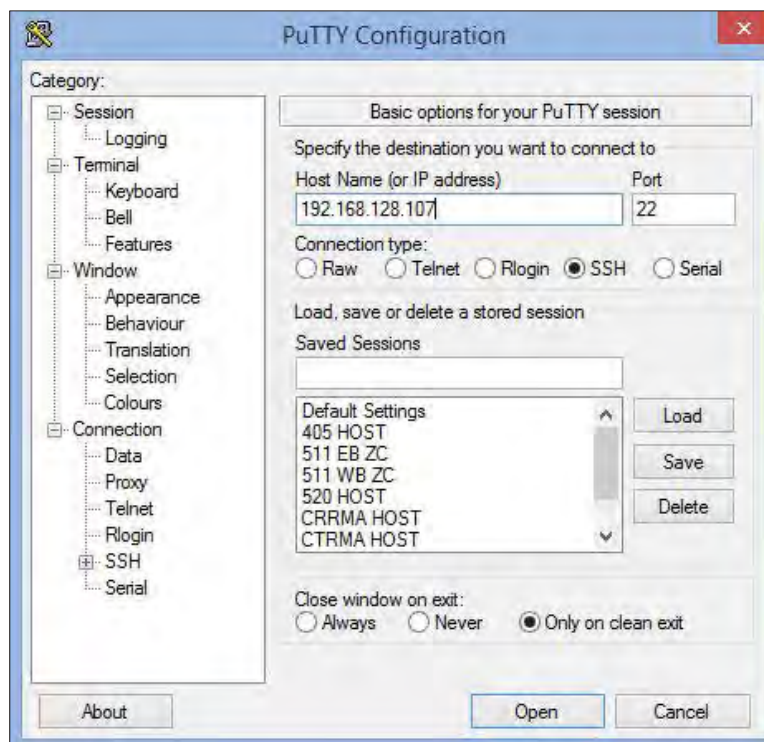
The purpose of this ITB is to explain how to use the Maint Menu on the ZC. The Maint Menu is very helpful to quickly find and solve various problems.

#### **Items needed:**

- Laptop computer
- PuTTY software

To get into the ZC, open a PuTTY session:

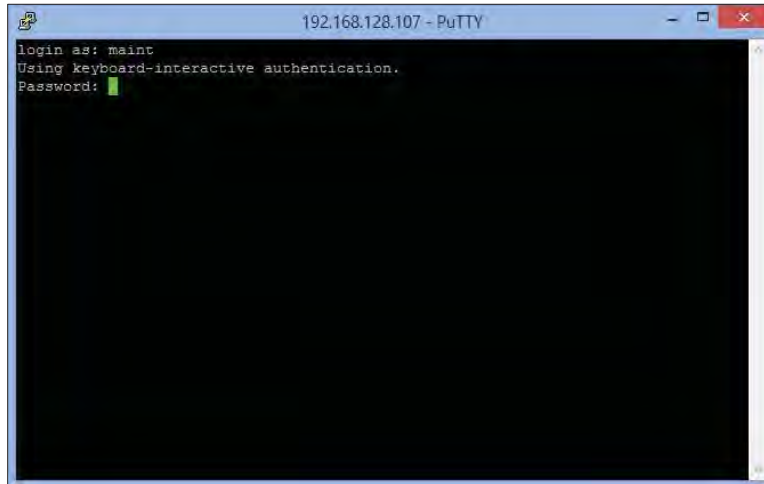
1. Type in the IP address the PuTTY session and press the Open button.



**Exhibit F-1: PuTTY Configuration**

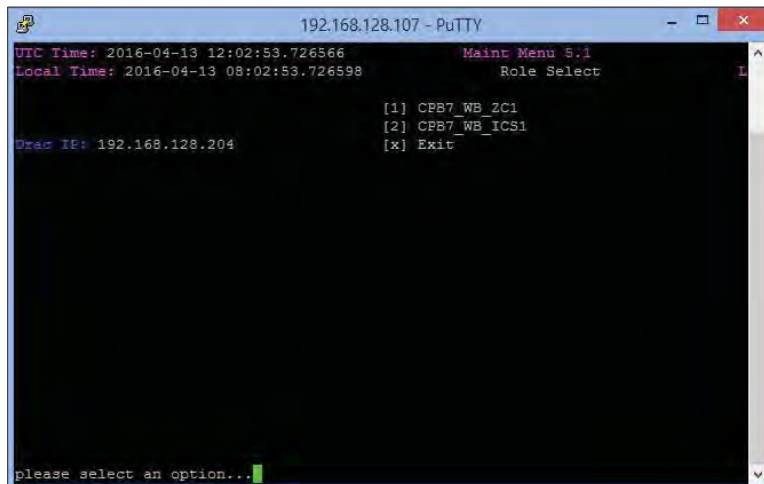


2. Login as: maint  
Then enter the password.



**Exhibit F-2: Enter Password Screen**

Then, the Maint Menu will come up.



**Exhibit F-3: Maint Menu Screen**

These servers are a Zone Controller and ICS combination.

## 3. Choose Option (1) to log into the ZC.

You will see:

- UTC Time and the Local Time
- Device Hostname
- IP address
- Drak IP address

The next three lines indicate whether the ZC uses SICK or Idris and Treadles.

```

192.168.128.107 - PuTTY
UTC Time: 2016-04-13 11:44:48.715451          Maint Menu 5.1
Local Time: 2016-04-13 07:44:48.715479          ZC OPTIONS

Device Name: CPB7_WB_ICS1                    [1] Transaction Data Menu
Device IP: 192.168.128.107                   [2] Get Number Of Transactions Left to I
Drak IP: 192.168.128.204                     [3] Tag Penetration Menu
                                              [4] Ping Menu
                                              [5] Tag Table Info
                                              [6] Apex Menu
                                              [7] Server Menu
                                              [8] Sick Menu
                                              [9] Treadle Menu
                                              [10] Diags
                                              [x] Exit

please select an option...

```

Exhibit F-4: ZC Options Screen

**Option [1]: Transaction Data Menu**

This is an easy way to see if transactions are good.

**Note:** Before opening this option, open the session to full screen for a clearer view.

```

192.168.128.107 - PuTTY
UTC Time: 2016-04-13 12:07:05.053187          Maint Menu 5.1
Local Time: 2016-04-13 08:07:05.053221          Transactions Data Menu

Device Name: CPS7_WB_ZC1                    [1] Show Recent Transactions
Device IP: 192.168.128.107                   [2] Transaction Statistics
Drak IP: 192.168.128.204                     [m] Back
Has Sick: True
Has Idris: False
Has Treadle: True

please select an option...

```

Exhibit F-5: Transactions Data Menu Screen

**Option [1]: Show Recent Transactions**

This shows the current transactions and what data we are getting for those transactions.

1. Lane number
2. TRX ID
3. TRX TIME
4. Forward axle count
5. Agency ID
6. Tag ID
7. Tag Status
8. Speed
9. TRX flag

lanenum	trxid	trxtime(utc)	trxtime(local)	fwdaxle	agencyid	tagid	tagstatus	speed	speed(mph)	trxflag
7	44298	2016-04-13 12:09:23.238995	2016-04-13 08:09:23.238995	2	32	15593	V	2026	45.32	Normal
7	44299	2016-04-13 12:09:28.166689	2016-04-13 08:09:28.166689	2	32	24987	V	1836	41.07	Normal
7	44300	2016-04-13 12:09:29.909942	2016-04-13 08:09:29.909942	2	32	41206	V	1861	41.63	Normal
7	44301	2016-04-13 12:09:31.291423	2016-04-13 08:09:31.291423	2	32	74225	V	1633	36.53	Normal
7	44302	2016-04-13 12:09:32.474217	2016-04-13 08:09:32.474217	2	32	242772	V	1550	34.67	Normal
7	44303	2016-04-13 12:09:33.615168	2016-04-13 08:09:33.615168	2	32	69204	V	1619	36.22	Normal
7	44304	2016-04-13 12:09:35.118282	2016-04-13 08:09:35.118282	2	32	236306	V	1765	39.48	Normal
7	44305	2016-04-13 12:09:36.780252	2016-04-13 08:09:36.780252	2	32	48657	V	1904	42.59	Normal
7	44306	2016-04-13 12:09:48.819551	2016-04-13 08:09:48.819551	2	32	41003	V	1875	41.94	Normal
7	44307	2016-04-13 12:09:54.749016	2016-04-13 08:09:54.749016	2	32	93771	V	2030	45.41	Normal
7	44308	2016-04-13 12:10:16.903568	2016-04-13 08:10:16.903568	2	32	242739	V	1882	42.1	Normal
7	44309	2016-04-13 12:10:22.491816	2016-04-13 08:10:22.491816	4	32	13467	V	1807	40.42	Normal
7	44310	2016-04-13 12:10:30.400570	2016-04-13 08:10:30.400570	2	32	242208	V	2009	44.94	Normal
7	44311	2016-04-13 12:10:32.908103	2016-04-13 08:10:32.908103	2	32	73047	V	2244	50.2	Normal
7	44312	2016-04-13 12:10:35.712403	2016-04-13 08:10:35.712403	2	32	227220	V	2231	49.91	Normal
7	44313	2016-04-13 12:10:38.236625	2016-04-13 08:10:38.236625	2	32	69867	V	1978	44.25	Normal
7	44314	2016-04-13 12:10:39.378952	2016-04-13 08:10:39.378952	2	32	234722	V	1815	40.6	Normal
7	44315	2016-04-13 12:10:42.483247	2016-04-13 08:10:42.483247	2	32	43508	V	1772	39.64	Normal

**Exhibit F-6: Data From Last 1000 Transactions Screen**

**Option [2]: Transaction Stat**

This will check each lane for the last 1000 transactions, showing Axle counts and the timeframe for those 1000 transactions.

```

192.168.128.107 - PuTTY
Stats of the last 1000 Trx
-----
PLAZA-LANE: 1-7

3 Axle: 1 Trx
2 Axle: 998 Trx
4 Axle: 1 Trx

Total Trx in Lane 7: 1000 Trx

Normal Trx : 1000 Trx

last trx(utc): 2016-04-13 12:31:04.998467
last trx(local): 2016-04-13 08:31:04.938467

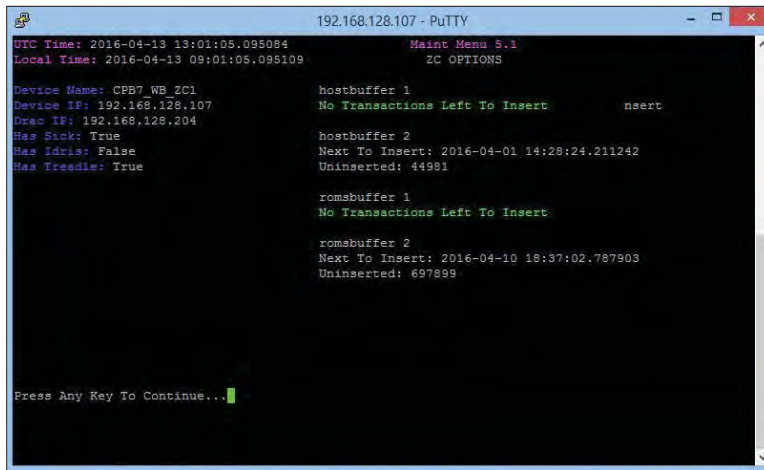
Press Any Key To Continue...
    
```

**Exhibit: F-7: Transaction Stat Screen**

Press (m) to go back to Main Menu.

**ZC Option [2]: Get Number of Transactions Left to Insert**

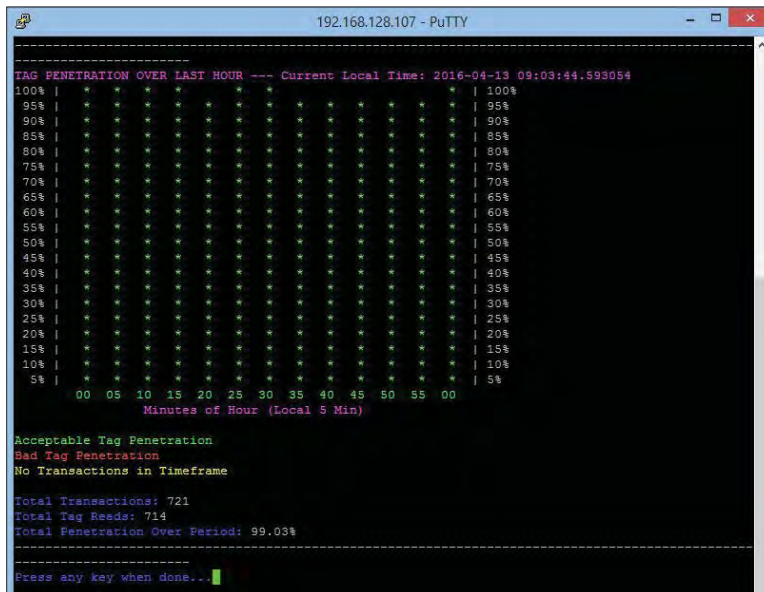
This shows whether or not your inserters are backed up.



**Exhibit F-8: ZC Options Screen**

**Option [3]: Tag Penetration Menu**

You can check your tag penetration over the last hour or the last day.



**Exhibit F-9: Tag Penetration Menu**

Press (m) to go back to main menu.

**Option [4]: Ping Menu**

Here you can ping all your devices from the ZC instead of going from your laptop to the device. This ensures all network switches are working as well as your device.

```

192.168.128.107 - PuTTY
UTC Time: 2016-04-13 13:11:20.063425          PINGING DEVICES
Local Time: 2016-04-13 09:11:20.063453      lease be patient.. Will print "Done" when finished

Device Name: CPB7_WB_ZC1                    cpb7-wb-cam-f1 (192.168.128.178) : No Reply
Device IP: 192.168.128.107                  cpb7-wb-cam-f2 (192.168.128.180) : OK
Mac IP: 192.168.128.204                    cpb7-wb-cam-o (192.168.128.2) : OK
Has Sick: True                             cpb7-wb-cam-r1 (192.168.128.179) : OK
Has Idiot: False                           cpb7-wb-cam-r2 (192.168.128.181) : OK
Has Treadle: True                          Done

Press Any Key To Continue...

```

**Exhibit F-10: Pinging Devices Screen**

Press (m) to go back to main menu.

**Option [5]: Tag Table Info.**

This shows the last tag table processed.

```

192.168.128.107 - PuTTY
UTC Time: 2016-04-13 13:14:41.317582          Tag Table Info
Local Time: 2016-04-13 09:14:41.317610

Device Name: CPB7_WB_ZC1                    Last Table Processed (local time): 2016-04-13 04:12:05
Device IP: 192.168.128.107                  nserf
Mac IP: 192.168.128.204
Has Sick: True
Has Idiot: False
Has Treadle: True

Press Any Key To Continue...

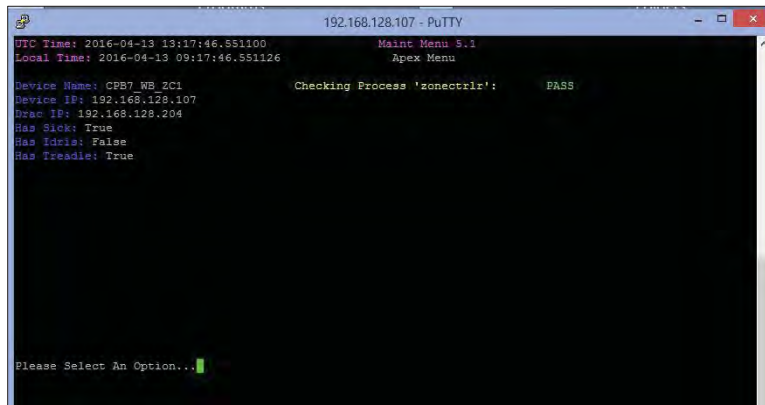
```

**Exhibit F-11: Tag Table Info. Screen**

Press (m) to go back to main menu.

**Option [6]: Apex Menu**

This is to check to see if Apex is running, the version of Apex, and to start or stop Apex.

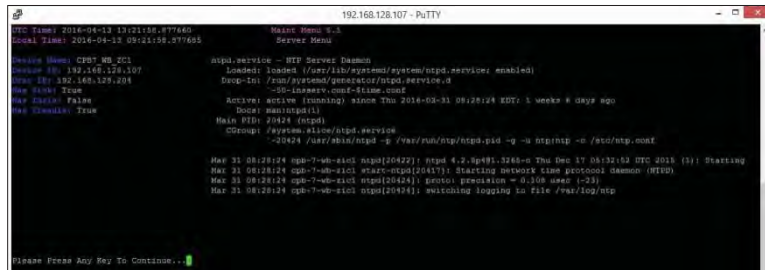


**Exhibit F-12: Apex Menu Screen**

Press (m) to go back to main menu.

**Option [7]: Server Menu**

Here you can check hardware status or NTP status. We recommend checking the NTP status here and checking the hardware from Nagios.



**Exhibit F-13: Server Menu Screen**

Press (m) to go back to main menu.

### Option [8]: SICK Menu

This shows you the live virtual information from the scanners in a visual look.

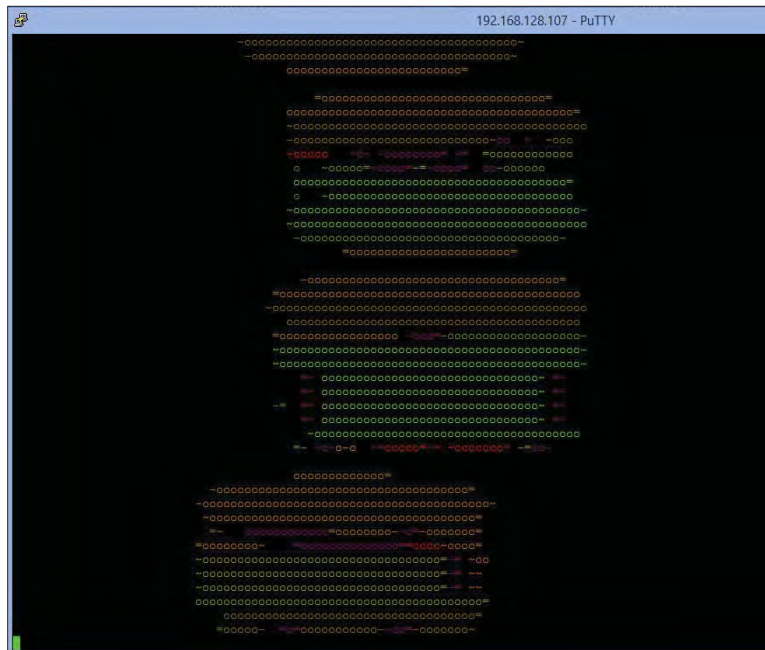


Exhibit F-14: SICK Menu Screen

Press (m) to go back to main menu.

### Option [9]: Treadle Menu

This is to check for treadle failures and treadle events.

- Shows treadle logs. You will see axle events and treadle failures for the time period you choose.



Exhibit F-15: Treadle Menu Screen

- Shows live treadle presses coming into the ZC.

```

192.168.128.107 - PuTTY
2016-Apr-13 14:18:27.873989 1143709 Lane7TreadleEH: sending axle event - AxleForward64425(0)(2016-Apr-13 14:18:27.8
267811624.4547510)
2016-Apr-13 14:18:17.802773 1143710 Lane7TreadleEH got lost presence from treadle 3
2016-Apr-13 14:18:27.497762 1143711 Lane7TreadleEH got presence from treadle 0 last treadle seen -1
2016-Apr-13 14:18:20.012753 1143712 Lane7TreadleEH got presence from treadle 1 last treadle seen 0
2016-Apr-13 14:18:20.017763 1143713 Lane7TreadleEH got lost presence from treadle 0
2016-Apr-13 14:18:20.020760 1143714 Lane7TreadleEH got presence from treadle 2 last treadle seen 1
2016-Apr-13 14:18:20.022756 1143715 Lane7TreadleEH got lost presence from treadle 1
2016-Apr-13 14:18:20.020765 1143716 Lane7TreadleEH got lost presence from treadle 2
2016-Apr-13 14:18:20.043759 1143717 Lane7TreadleEH got presence from treadle 3 last treadle seen 2
2016-Apr-13 14:18:20.044072 1143731 Lane7TreadleEH: sending axle event - AxleForward64425(0)(2016-Apr-13 14:18:27.9
9764911651.9170510)
2016-Apr-13 14:18:20.053770 1143732 Lane7TreadleEH got lost presence from treadle 3
2016-Apr-13 14:18:20.043025 1143733 Lane7TreadleEH got presence from treadle 0 last treadle seen -1
2016-Apr-13 14:18:20.578000 1143734 Lane7TreadleEH got presence from treadle 1 last treadle seen 0
2016-Apr-13 14:18:20.583034 1143735 Lane7TreadleEH got lost presence from treadle 0
2016-Apr-13 14:18:20.594760 1143736 Lane7TreadleEH got presence from treadle 2 last treadle seen 1
2016-Apr-13 14:18:20.598730 1143737 Lane7TreadleEH got lost presence from treadle 1
2016-Apr-13 14:18:20.609876 1143738 Lane7TreadleEH got lost presence from treadle 2
2016-Apr-13 14:18:20.609951 1143739 Lane7TreadleEH got presence from treadle 3 last treadle seen 2
2016-Apr-13 14:18:20.610210 1143753 Lane7TreadleEH: sending axle event - AxleForward64425(0)(2016-Apr-13 14:18:20.6
636661645.2303510)
2016-Apr-13 14:18:20.620756 1143754 Lane7TreadleEH got lost presence from treadle 3
2016-Apr-13 14:18:20.348892 1143755 Lane7TreadleEH got presence from treadle 0 last treadle seen -1
2016-Apr-13 14:18:20.764798 1143756 Lane7TreadleEH got presence from treadle 1 last treadle seen 0
2016-Apr-13 14:18:20.760726 1143757 Lane7TreadleEH got lost presence from treadle 0
2016-Apr-13 14:18:20.780790 1143758 Lane7TreadleEH got presence from treadle 2 last treadle seen 1
2016-Apr-13 14:18:20.784790 1143759 Lane7TreadleEH got lost presence from treadle 1
2016-Apr-13 14:18:20.789722 1143760 Lane7TreadleEH got lost presence from treadle 2
2016-Apr-13 14:18:20.795913 1143761 Lane7TreadleEH got presence from treadle 3 last treadle seen 2
2016-Apr-13 14:18:20.796233 1143775 Lane7TreadleEH: sending axle event - AxleForward64425(0)(2016-Apr-13 14:18:20.7
4875911617.3558910)
2016-Apr-13 14:18:20.803770 1143776 Lane7TreadleEH got lost presence from treadle 3
2016-Apr-13 14:18:45.346050 1143777 Lane7TreadleEH got presence from treadle 0 last treadle seen -1
2016-Apr-13 14:18:45.309971 1143778 Lane7TreadleEH got presence from treadle 1 last treadle seen 0
2016-Apr-13 14:18:45.316362 1143779 Lane7TreadleEH got lost presence from treadle 0
2016-Apr-13 14:18:45.523999 1143780 Lane7TreadleEH got presence from treadle 2 last treadle seen 1
2016-Apr-13 14:18:45.520924 1143781 Lane7TreadleEH got lost presence from treadle 1
2016-Apr-13 14:18:45.522995 1143782 Lane7TreadleEH got lost presence from treadle 2
2016-Apr-13 14:18:45.135999 1143783 Lane7TreadleEH got presence from treadle 3 last treadle seen 2
2016-Apr-13 14:18:45.356210 1143797 Lane7TreadleEH: sending axle event - AxleForward64425(0)(2016-Apr-13 14:18:45.4
958531904.7031210)
2016-Apr-13 14:18:45.145988 1143798 Lane7TreadleEH got lost presence from treadle 3
2016-Apr-13 14:18:45.657225 1143799 Lane7TreadleEH got presence from treadle 0 last treadle seen -1
    
```

Exhibit F-16: Treadle Presses Screen

Press (m) to go back to main menu.

**Option [10]: Diags Menu**

This is where you can reboot devices in the lanes using the reset menu. There are other scripts here you can choose from.

```

-Trace- DiagClient activated underlying thread, pthread ID= 3052993392 and Linux
x TID= 30132
-Trace- DiagClientEH activated underlying thread, pthread ID= 3036207984 and Li
nux TID= 30134
-Trace- DiagnosticNet activated underlying thread, pthread ID= 3019422576 and L
inux TID= 30136
-Trace- Timer activated underlying thread, pthread ID= 3002637168 and Linux TID
= 30138
Connecting to host...Connected.

Main menu:
[V] Verification Tests
[A] Alarms
[B] Reboot zone controller
[C] Components
[I] Command line interface
[L] Login
[M] Change lane mode
[R] Reset menu
[S] System info
[T] Load tag table
[H] Shutdown / halt Apex
[X] Exit
diags>
    
```

Exhibit F-17: Diags Menu Screen

The most common thing we use in this menu is option [R] the Reset menu.

- To Exit the PuTTY Session:
  - Select Option [x] to Exit. Always exit using this option.



GOLDEN GATE BRIDGE (GGB) HIGHWAY & TRANSPORTATION DISTRICT  
 TOLLING DESIGN  
 REPLACEMENT TOLL COLLECTION SYSTEM (RTCS)  
 RFP 2017-B-04  
 KAPSCH TRAFFICCOM

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**GGB – HTD  
 RTCS  
 COVER PAGE**

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1	COVER PAGE
2	INDEX
3	LAYOUT – CRITICAL DIMENSIONS
4	POWER BLOCK DIAGRAM
5	COMMUNICATION BLOCK DIAGRAM
6	AVI BLOCK DIAGRAM
7	SYSTEM NETWORK ARCHITECTURE

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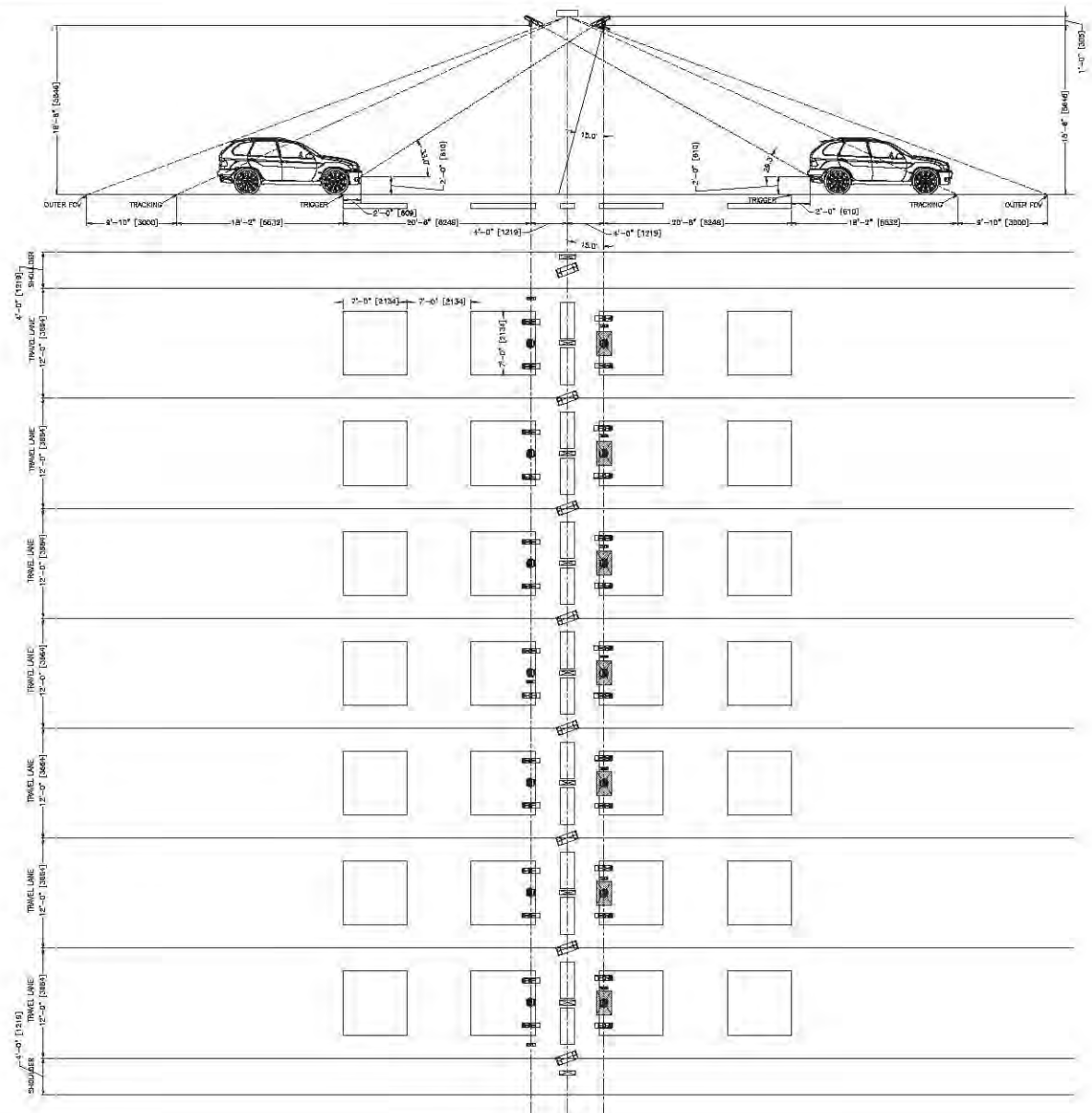
DATE	DESCRIPTION	REV.

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- STROKE, PLAN VIEW
- VES CAMERA, PLAN VIEW
- VES CAMERA, PROFILE VIEW
- AM ANTENNA, PLAN VIEW
- AM ANTENNA, PROFILE VIEW
- HVIC SENSOR, PROFILE VIEW
- HVIC SENSOR, PLAN VIEW
- HVIC ILLUMINATOR, PLAN VIEW
- DWS CAMERA, PLAN VIEW

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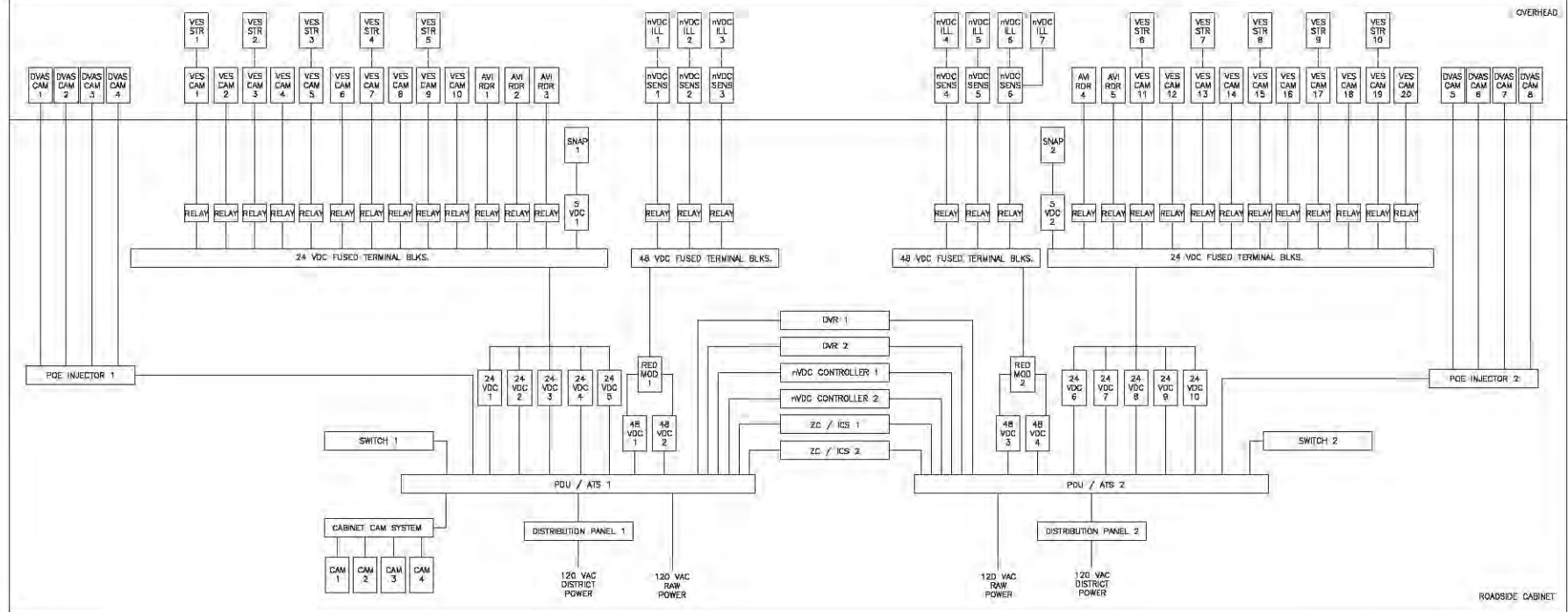
DATE	DESCRIPTION	REV.

KAPSCHE TRAFFICCOM TRANSPORTATION (KTT)  
 211 E SEVENTH STREET, SUITE 800, AUSTIN, TEXAS 78701

**GGB - HTD**  
**RTCS**  
**LAYOUT &**  
**CRITICAL DIMENSIONS**

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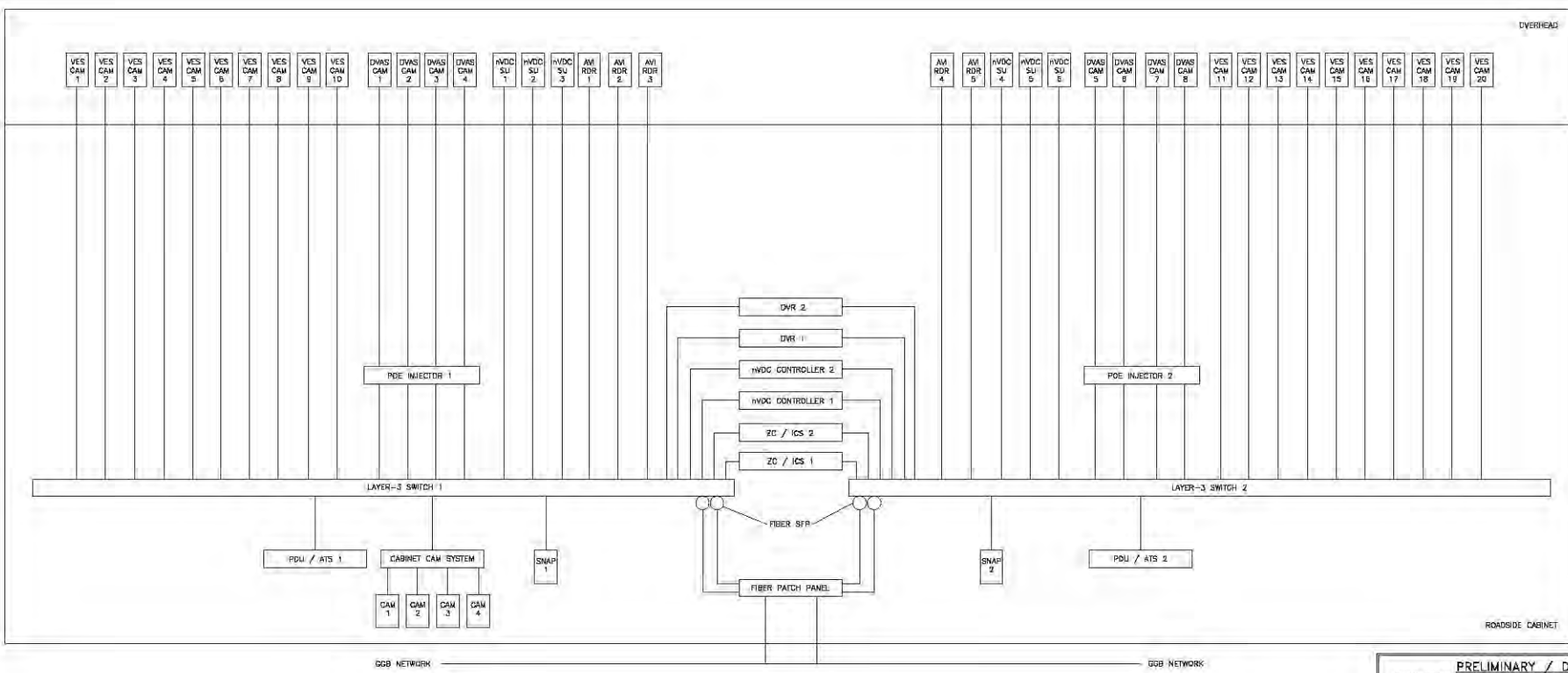
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DATE	DESCRIPTION	REV.

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**GGB - HTD  
 RTCS  
 POWER BLOCK DIAGRAM**

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NOTES:  
 1) nVDC SENSOR UNITS ARE ON AN ISOLATED VLAN.

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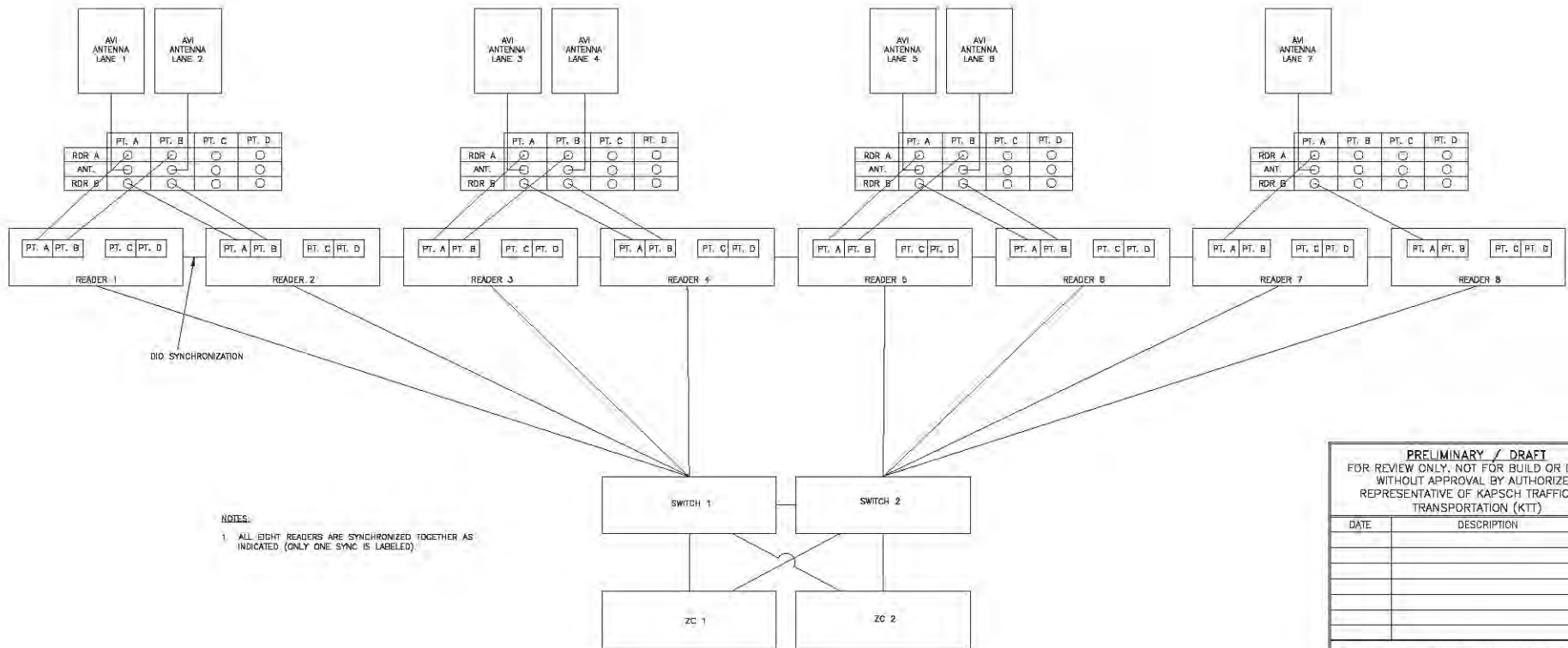
DATE	DESCRIPTION	REV.

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**GGB - HTD  
 RTCS  
 COMM. BLOCK DIAGRAM**

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**NOTES:**  
 1. ALL IDENTICAL READERS ARE SYNCHRONIZED TOGETHER AS INDICATED (ONLY ONE SYNC IS LABELED).

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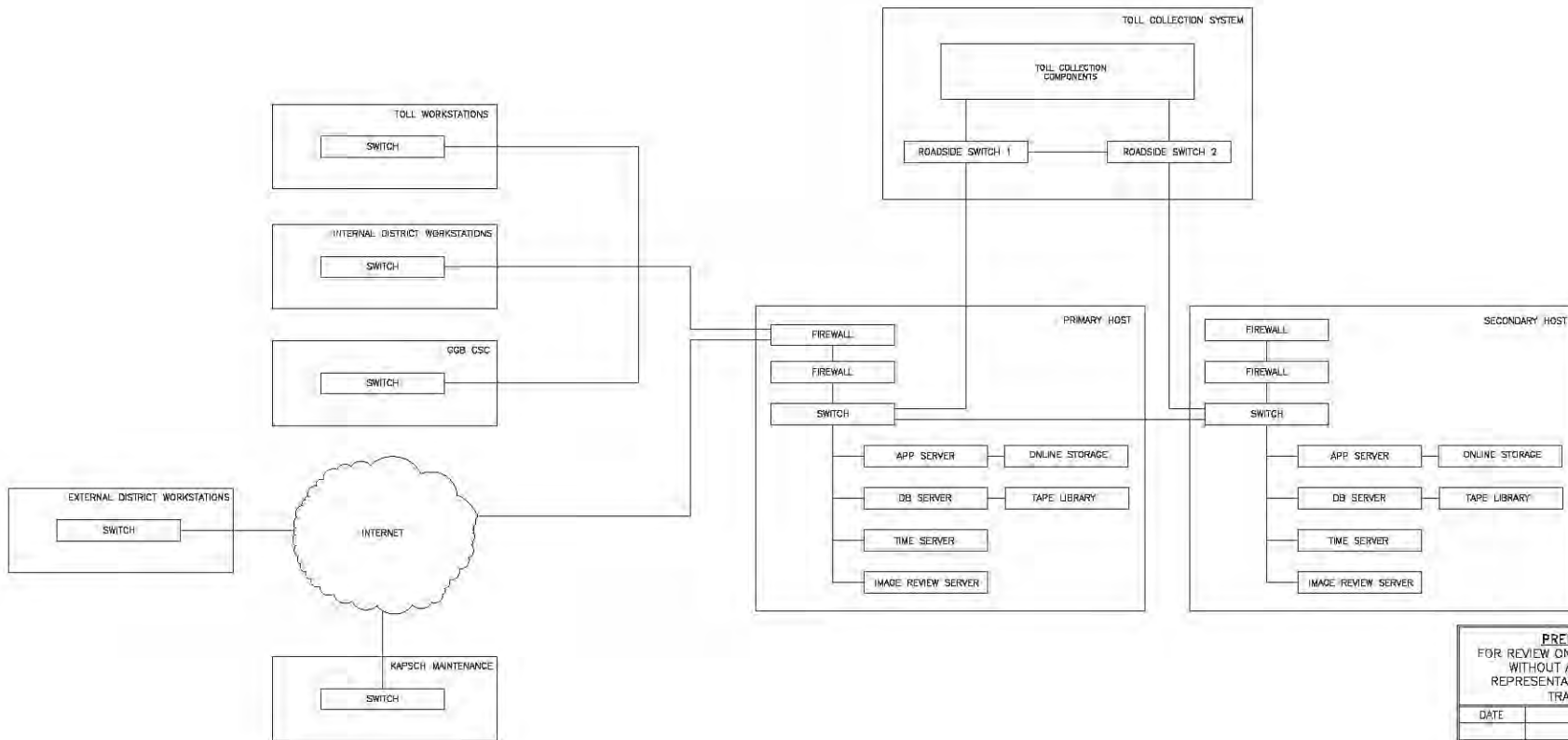
DATE	DESCRIPTION	REV.

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**GGB - HTD**  
**RTCS**  
**AVI BLOCK DIAGRAM**

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**GGB - HTD  
 RTCS  
 SYSTEM NETWORK ARCH.**

DATE: 11/03/2016 SHEET 7 OF SHEETS

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--	---



CSC Daily Revenue Reconciliati...

### CSC Daily Revenue Reconciliation

Revenue Date: 06/20/2016 Turnpike: US290 E

PDF | Excel | Preview Report

Agency ID	Rev Type	Host Data		CSC Recon Data			Variance	
		Exp Cnt	Exp Amt	Post date	Act Cnt	Act Amt	Count	Amount
HCTRA	AVI	81	\$94.60		0	\$0.00	0	\$0.00
TxDOT	AVI	4,345	\$4,003.45		0	\$0.00	0	\$0.00
NTTA	AVI	25	\$33.55		0	\$0.00	0	\$0.00
<b>Total Revenue</b>		<b>4,451</b>	<b>\$4,131.60</b>		<b>0</b>	<b>\$0.00</b>	<b>0</b>	<b>\$0.00</b>



CSC Daily Transaction Reconcil...

### CSC Daily Transaction Reconciliation

Revenue Date: 08/19/2016 Turnpike: US290 E

PDF Excel Preview Report

Plaza	CTRMA Valid							Non Revenue		CTRMA Invalid					Reconciliation			
	Transmitted	Total	TxDOT	HCTRA	NTTA	Rejected	Reconciled	Var	Expected	Posted	Transmitted	Posted	Rej	Reconciled	Var	Total Trans	Total Recon	Pending
183 Entry	2,116	2,108	1,626	397	85	8	2,116	0	0	0	0	0	0	0	0	2,116	2,116	0
183 Exit	2,184	2,182	1,196	906	80	2	2,184	0	0	0	0	0	0	0	0	2,184	2,184	0
Giles Lane EB	323	321	282	20	19	2	323	0	0	0	0	0	0	0	0	323	323	0
Giles Lane WB	421	419	369	25	25	2	421	0	0	0	0	0	0	0	0	421	421	0
Giles Mainline	8,557	8,534	5,113	3,065	356	23	8,557	0	0	0	0	0	0	0	0	8,557	8,557	0
Harris Branch EB	86	86	64	17	5	0	86	0	0	0	0	0	0	0	0	86	86	0
Harris Branch WB	84	84	63	13	8	0	84	0	0	0	0	0	0	0	0	84	84	0
Farmer Mainline	7,970	7,947	4,176	3,461	310	23	7,970	0	0	0	0	0	0	0	0	7,970	7,970	0
Springdale Road EB	138	138	111	20	7	0	138	0	0	0	0	0	0	0	0	138	138	0
Springdale Road WB	91	91	81	9	1	0	91	0	0	0	0	0	0	0	0	91	91	0
<b>Total</b>	<b>21,970</b>	<b>21,910</b>	<b>13,081</b>	<b>7,933</b>	<b>896.00</b>	<b>60</b>	<b>21,970</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21,970</b>	<b>21,970</b>	<b>0</b>

Transaction Summary	Counts
Valid AVI Transactions sent to CSC	21,970
Non Rev Transactions sent to CSC	0
Invalid AVI Transactions sent to CSC	0
Total Transactions sent to CSC	21,970
Total Non Rev Transactions posted to CSC	21,910
Total Transactions posted by CSC	0
Total Transactions Rejected by CSC	60

Display 50 records per page Search:

Revenue Summary	Revenue
-----------------	---------



CSC Image Review Counts

### CSC Image Review Counts

Start Date: 06/13/2016 End Date: 06/21/2016 Turnpike: US290 E

PDF Excel Preview Report

Plaza	Sent	Received	Delta
183 Exit	17,992	0	17,992
183 Entry	24,359	0	24,359
Springdale Road EB	2,605	0	2,605
Springdale Road WB	1,472	0	1,472
Giles Lane EB	4,910	0	4,910
Giles Lane WB	5,240	0	5,240
Giles Mainline	86,088	0	86,088
Harris Branch WB	1,934	0	1,934
Harris Branch EB	2,270	0	2,270
Parmer Mainline	56,633	0	56,633
<b>Total</b>	<b>203,503</b>	<b>0</b>	<b>203,503</b>

CSC Payment Reconciliation

### CSC Payment Reconciliation

Start Date: 06/20/2016 End Date: 06/21/2016 Turnpike: All Agency: All

- PDF
- Excel
- Preview Report

Post Date	Agency	Rev Date	Tolls Posted/Paid				Tolls Posted/Paid			
			Valid Count	Invalid Count	Valid Rev	Invalid Rev	Total Fees	Valid Count	Valid Rev	Total Fees
06/20/2016	HCTRA	06/19/2016	74,512	0	\$73,722.34	\$0.00	\$0.00	0	\$0.00	\$0.00
<b>Total</b>			74,512	0	\$73,722.34	\$0.00	\$0.00	0	\$0.00	\$0.00

CSC Placement Counts

CSC Placement Counts

Revenue Date: 06/19/2016 Turnpike: US290 E

PDF Excel Preview Report

Display 50 records per page

Search:

Plaza	Trx Date	Count
183 Exit	06/06/2016	1
183 Exit	06/07/2016	90
183 Exit	06/08/2016	8
183 Exit	06/09/2016	1
183 Exit	06/10/2016	3
183 Exit	06/11/2016	433
183 Exit	06/12/2016	360
183 Entry	06/06/2016	2
183 Entry	06/07/2016	66
183 Entry	06/08/2016	58
183 Entry	06/09/2016	1
183 Entry	06/10/2016	4
183 Entry	06/11/2016	544
183 Entry	06/12/2016	509
Springdale Road EB	06/07/2016	10
Springdale Road EB	06/08/2016	2
Springdale Road EB	06/11/2016	97
Springdale Road EB	06/12/2016	68
Springdale Road WB	06/07/2016	2
Springdale Road WB	06/08/2016	6
		<b>10,964</b>

Showing 1 to 50 of 56 records

Previous 1 2 Next

CSC Placement Counts loaded.



CSC Transmission Reconciliation

### CSC Transmission Reconciliation

Revenue Date: 06/19/2016

Turnpike	TxDOT Valid	TxDOT iToll	TxDOT Total	NTTA Valid	NTTA iToll	NTTA Total	HCTRA Valid	HCTRA iToll	HCTRA Total	Pay-By-Mail	CSC Total
US290 E	18,425	4,206	22,631	1,157	313	1,470	8,448	623	9,071	10,964	44,136
SH550	910	105	1,015	170	63	233	279	82	361	10,000	11,609
183-A	54,448	8,516	62,964	2,976	516	3,492	4,182	665	4,847	18,305	89,608
NETRMA	11,724	2,187	13,911	6,262	19	6,281	1,064	16	1,080	746	22,018
CRRMA	18		18	38		38	2		2	493	551
<b>Total</b>	<b>85,525</b>	<b>85,525</b>	<b>15,014</b>	<b>15,014</b>					<b>100,539</b>	<b>10,603</b>	<b>911</b>

Display 50 records per page Search:

File Control#	To Agency	File Name	Trans Count	Transmit Time	Ack Time	Ack File Name
375429	HCTRA	IOP_CTRMA_IOPHUB_20160619_090501_00375429.TRX	1,359	06/19/2016 03:39:38		
375430	NTTA	IOP_CTRMA_IOPHUB_20160619_100501_00375430.TRX	2,708	06/19/2016 04:49:24		
375431	TxDOT	IOP_CTRMA_IOPHUB_20160619_110501_00375431.TRX	29,544	06/19/2016 05:23:41		
375432	TxDOT	IOP_CTRMA_IOPHUB_20160619_140501_00375432.TRX	1,818	06/19/2016 08:44:38		
375433	TxDOT	IOP_CTRMA_IOPHUB_20160619_181001_00375433.TRX	15,014	06/19/2016 12:20:34		
375434	NTTA	IOP_CTRMA_IOPHUB_20160619_191001_00375434.TRX	911	06/19/2016 13:18:05		
375435	HCTRA	IOP_CTRMA_IOPHUB_20160619_201001_00375435.TRX	1,386	06/19/2016 14:13:20		
375436	TxDOT	IOP_CTRMA_IOPHUB_20160619_210501_00375436.TRX	35,184	06/19/2016 15:44:49		
375441	TxDOT	IOP_CTRMA_IOPHUB_20160620_000502_00375441.TRX	18,979	06/19/2016 18:15:59		
375442	NTTA	IOP_CTRMA_IOPHUB_20160620_010501_00375442.TRX	7,895	06/19/2016 19:34:10		
375443	HCTRA	IOP_CTRMA_IOPHUB_20160620_030501_00375443.TRX	12,616	06/19/2016 21:13:42		
<b>Total</b>						

### Daily Express Lane Volume And Toll Rates Summary

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All

PDF Excel Preview Report

Display 50 records per page

Search:

Segment	Date Interval	EL Speed	EL Volume	EL Occupancy	EL Density	LOS Raw	LOS ID	LOS Char	EL Toll
LP1X NB: 2222 to Parmar	06/20/16 00:00:00 - 06/20/16 00:03:59	65.50	0.00	1.33%	7.79	5.30	6	A	\$0.25
LP1X NB: CVZ to 183	06/20/16 00:00:00 - 06/20/16 00:03:59	72.50	0.00	0.53%	3.10	5.72	6	A	\$0.25
LP1X NB: CVZ to Parmar	06/20/16 00:00:00 - 06/20/16 00:03:59	88.82	0.00	0.93%	5.34	5.52	6	A	\$0.25
LP1X NB: 2222 to Parmar	06/20/16 00:04:00 - 06/20/16 00:07:59	66.00	0.00	1.72%	10.45	5.06	6	A	\$0.25
LP1X NB: CVZ to 183	06/20/16 00:04:00 - 06/20/16 00:07:59	67.50	0.00	0.44%	2.67	5.76	6	A	\$0.25
LP1X NB: CVZ to Parmar	06/20/16 00:04:00 - 06/20/16 00:07:59	66.74	0.00	1.08%	6.52	5.41	6	A	\$0.25
LP1X NB: 2222 to Parmar	06/20/16 00:08:00 - 06/20/16 00:11:59	65.00	0.00	2.36%	7.15	5.36	6	A	\$0.25
LP1X NB: CVZ to 183	06/20/16 00:08:00 - 06/20/16 00:11:59	63.50	0.00	0.28%	1.65	5.85	6	A	\$0.25
LP1X NB: CVZ to Parmar	06/20/16 00:08:00 - 06/20/16 00:11:59	64.24	0.00	1.32%	4.44	5.60	6	A	\$0.25
LP1X NB: 2222 to Parmar	06/20/16 00:12:00 - 06/20/16 00:15:59	64.00	0.00	2.30%	5.86	5.47	6	A	\$0.25
LP1X NB: CVZ to 183	06/20/16 00:12:00 - 06/20/16 00:15:59	65.00	0.00	0.25%	0.69	5.94	6	A	\$0.25
LP1X NB: CVZ to Parmar	06/20/16 00:12:00 - 06/20/16 00:15:59	64.50	0.00	1.28%	3.26	5.71	6	A	\$0.25
LP1X NB: 2222 to Parmar	06/20/16 00:16:00 - 06/20/16 00:19:59	64.00	0.00	2.30%	5.86	5.47	6	A	\$0.25
LP1X NB: CVZ to 183	06/20/16 00:16:00 - 06/20/16 00:19:59	67.00	0.00	0.14%	0.45	5.96	6	A	\$0.25
LP1X NB: CVZ to Parmar	06/20/16 00:16:00 - 06/20/16 00:19:59	65.47	0.00	1.22%	3.09	5.72	6	A	\$0.25
LP1X NB: 2222 to Parmar	06/20/16 00:20:00 - 06/20/16 00:23:59	60.00	0.00	1.12%	3.50	5.68	6	A	\$0.25
LP1X NB: CVZ to 183	06/20/16 00:20:00 - 06/20/16 00:23:59	67.00	0.00	0.14%	0.45	5.96	6	A	\$0.25
LP1X NB: CVZ to Parmar	06/20/16 00:20:00 - 06/20/16 00:23:59	63.31	0.00	0.63%	1.90	5.83	6	A	\$0.25
LP1X NB: 2222 to Parmar	06/20/16 00:24:00 - 06/20/16 00:27:59	62.00	0.00	1.58%	8.71	5.22	6	A	\$0.25
LP1X NB: CVZ to 183	06/20/16 00:24:00 - 06/20/16 00:27:59	66.00	0.00	0.07%	0.23	5.98	6	A	\$0.25

Showing 1 to 50 of 488 records

Previous 1 2 3 4 5 ... 10 Next

Daily Trip Summary Report

## Daily Trip Summary Report

Start Date: 06/15/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All

PDF Excel Preview Report

Trip Date	Txn Cnt	Trip Cnt	Pending Cnt	Avg Txn per Trip
06/15/2016	15	2	13	1
06/16/2016	16	3	13	1
06/17/2016	85	5	80	1
06/18/2016	29	0	29	
06/19/2016	103	28	75	1
06/20/2016	4	0	4	
<b>Total</b>	<b>252</b>	<b>38</b>	<b>214</b>	

Detailed OCR

Detailed OCR

Start Date: 06/19/2016 | Start Time: 00:00 | End Date: 06/21/2016 | End Time: 23:59

Turnpike: All | Plaza: All | Users: All

PDF | Excel | Preview Report

Display 50 records per page

Search:

Trip Id	Trx Id	Lane	Trx DateTime	Camera	Img	Img Type	OCR Cnfd	Plate	Plate Cnfd	State	State Cnfd	Type	Type Cnfd	Human Rev Fig	Original OCR Plate Info	OCR Tmst
9455124	500328132	FWN-LN1	06/19/2016 14:34:56.493120	30932		Rear	96%	11780D9	90%	TX	98%	PAS	90%	N		06/19/2016 14:36:04.269
9455124	500328132	FWN-LN1	06/19/2016 14:34:56.493120	30930		Front	96%	1178009	90%	TX	98%	PAS	90%	N		06/19/2016 14:36:03.325
	500328134	FWN-LN1	06/19/2016 14:37:42.194999	30932		Rear	0%		0%		0%		0%	N		06/19/2016 14:39:35.897
	500328134	FWN-LN1	06/19/2016 14:37:42.194999	30930		Front	0%	116315C3	85%	TX	76%	PAS	90%	N		06/19/2016 14:39:32.365
	500328136	FWN-LN1	06/19/2016 14:39:36.015019	30943		Rear	90%	1070926	89%	TX	98%	PAS	90%	N		06/19/2016 14:40:26.229
	500328136	FWN-LN1	06/19/2016 14:39:36.015019	30941		Front	22%	70926	85%	TX	96%	PAS	90%	N		06/19/2016 14:40:24.822
	500328136	FWN-LN1	06/19/2016 14:39:36.015019	30930		Front	44%	ID70926	87%	TX	98%	PAS	90%	N		06/19/2016 14:40:23.437
	500328142	FWN-LN1	06/19/2016 14:39:43.146170	30941		Front	31%	858308	84%	TX	98%	PAS	90%	N		06/19/2016 14:41:22.039
	500328142	FWN-LN1	06/19/2016 14:39:43.146170	30932		Rear	77%	858308	88%	TX	98%	PAS	90%	N		06/19/2016 14:41:29.816
	500328142	FWN-LN1	06/19/2016 14:39:43.146170	30930		Front	2%	858308	83%	TX	98%	PAS	90%	N		06/19/2016 14:41:24.503
	500328138	FWN-LN1	06/19/2016 14:39:44.995493	30943		Rear	0%	ITF7	71%	TX	76%	PAS	90%	N		06/19/2016 14:40:32.993
	500328138	FWN-LN1	06/19/2016 14:39:44.995493	30941		Front	0%	1U8619	79%	TX	98%	PAS	90%	N		06/19/2016 14:40:31.355
	500328138	FWN-LN1	06/19/2016 14:39:44.995493	30932		Rear	96%	1108619	90%	TX	98%	PAS	90%	N		06/19/2016 14:40:27.489
	500328138	FWN-LN1	06/19/2016 14:39:44.995493	30930		Front	0%	8619	82%	TX	98%	PAS	90%	N		06/19/2016 14:40:34.422
9455125	500328140	FWN-LN1	06/19/2016 14:39:49.136521	30932		Rear	96%	1165151	90%	TX	98%	PAS	90%	N		06/19/2016 14:41:31.116

Showing 1 to 50 of 119 records

Previous 1 2 3 Next



Detailed Transaction

Detailed Transaction

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/20/2016 End Time: 08:59

Turnpike: US290 E Plaza: 183 Exit Lane: All

PDF Excel Preview Report

Display 50 records per page

Search:

		Axles																								
PI	Ln	Trx Time	PI Trx ID	Trx Id	Mod	F	R	I	UO	Deg	Exp	Veh Entry Time	Exit	Str	Straddle Time	OCR Info	Ag	Tag Id	Prime	Status	Read Tmst	Axle	Tag Protocol	Handshake count	Img	Spd
183 Exit	5	06/20/2016 00:03:15.836	692216855	4909718	0	2	0		Normal		\$0.55	06/20 00:03:15.274		N					No				NA	0.0,0		63
183 Exit	3	06/20/2016 00:03:42.406	692216871	4909719	0	2	0		Normal		\$0.55	06/20 00:03:41.813		N			103	HCTR05815116	No	I	06/20 00:03:42.294		NA	9.0,0		57
183 Exit	5	06/20/2016 00:03:48.485	692216877	4909720	0	2	0	2	Normal		\$0.55	06/20 00:03:47.983		N			101	TEX.02621413	Yes	G	06/20 00:03:48.345	2	NA	3.0,0		75
183 Exit	3	06/20/2016 00:08:04.365	692217115	4909721	0	2	0		Normal		\$0.55	06/20 00:08:03.883		N			102	DNT.10307801	No	I	06/20 00:08:04.282		NA	4.0,0		73
183 Exit	5	06/20/2016 00:08:54.725	692217162	4909722	0	2	0		Normal		\$0.55	06/20 00:08:54.233		N			101	TEX.02163138	No	I	06/20 00:08:54.642		NA	5.0,0		70
183 Exit	5	06/20/2016 00:11:05.665	692217763	4909723	0	2	0		Normal		\$0.55	06/20 00:11:05.113		N			101	TEX.02997238	No	N	06/20 00:11:05.524		NA	3.0,0		69
183 Exit	4	06/20/2016 00:13:52.826	692217764	4909724	0	2	0	2	Normal		\$0.55	06/20 00:13:52.264		N			103	HCTR07345653	Yes	G	06/20 00:13:52.734	2	NA	6.0,0		62
183 Exit	5	06/20/2016 00:15:01.506	692217765	4909725	0	2	0		Normal		\$0.55	06/20 00:15:00.984		N			102	DNT.10570486	No	N	06/20 00:15:01.413		NA	1.0,0		67
183 Exit	4	06/20/2016 00:15:50.466	692217766	4909726	0	2	0		Normal		\$0.55	06/20 00:15:49.844		N					No				NA	0.0,0		64
183 Exit	4	06/20/2016 00:16:15.076	692217767	4909727	0	2	0	2	Normal		\$0.55	06/20 00:16:14.534		N			101	TEX.02434218	Yes	G	06/20 00:16:14.928	2	NA	5.0,0		68
183 Exit	4	06/20/2016 00:17:01.876	692217768	4909728	0	2	0		Normal		\$0.55	06/20 00:17:01.354		N					No				NA	0.0,0		67
183 Exit	5	06/20/2016 00:19:16.556	692217841	4909729	0	2	0		Normal		\$0.55	06/20 00:19:16.074		N			101	TEX.01965762	No	N	06/20 00:19:16.482		NA	4.0,0		70
183 Exit	4	06/20/2016 00:21:12.826	692218104	4909730	0	2	0		Normal		\$0.55	06/20 00:21:12.294		N					No				NA	0.0,0		66
183 Exit	4	06/20/2016 00:21:19.386	692218106	4909731	0	2	0		Normal		\$0.55	06/20 00:21:18.814		N					No				NA	0.0,0		62

Showing 1 to 50 of 849 records



Down Time Analysis

### Down Time Analysis

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All Plaza: All

PDF Excel Preview Report

Display 50 records per page Search:

Location Name	Up Time	Down Time	Location Path
Removed from System	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\
ENN-NB-ITS2	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
PHSHost2NetDevice	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\PHSHost1NetDevice
Host2NetDevice	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
Report	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ROMS1NetDevice	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ROMS2NetDevice	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
QueueMonitor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ExternalMonitorEH	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ExternalMonitorNetDevice	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint17NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint18NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint19NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint21NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint22NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint23NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint24NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\
ReadPoint25NSmartSensor	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	\\

Showing 1 to 50 of 12,722 records

Previous 1 2 3 4 5 ... 255 Next



Employee List

### Employee List

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

PDF Excel Preview Report

Username	Creation Date	Last Login	Status	Assigned Roles
Burrola, Albert (ABURROLA)	10/14/2015 13:30:44	06/20/2016 05:40:44	Active	ADMINISTRATOR,AUDITOR,CCRMA Access,CTRMA Access,Ccrma User,Ctrma User,Netrma User,SUPERVISOR,Tech
Dyck, Christopher (CDYCK)	07/20/2015 14:45:13	06/20/2016 06:05:38	Active	ADMINISTRATOR,AUDITOR,CCRMA Access,CTRMA Access,Ccrma User,Ctrma User,Netrma User,SUPERVISOR,Tech
Wristen, Jennifer (JWRISTEN)	08/14/2014 08:19:12	06/20/2016 07:57:46	Active	Msb_Access
Thomason, Cori (CTHOMASON)	06/24/2013 15:26:52	06/20/2016 09:55:41	Active	AUDITOR,CCRMA Access,CTRMA Access,Ccrma User,Ctrma User,Netrma User
Pincus, Ben (BPINCUS3)	05/25/2016 10:04:50	06/20/2016 10:00:23	Active	ADMINISTRATOR,AUDITOR,CCRMA Access,Ccrma User,Ctrma User,Elcc Supervisor,Fastreviewer,Field Supervisor,Fullreviewer,Mopac User,Supervisoryreviewer
Aguilera, Carlos (CAGUILERA)	04/14/2015 14:14:56	06/20/2016 10:12:37	Active	10,ADMINISTRATOR,AUDITOR,Authority Staff,CCRMA Access,CLERK,COLLECTOR,CTRMA Access,Ccrma User,Ctrma User,Director Of Toll Operations,Elcc Auditor,Elcc Operator,Elcc Supervisor,Fastreviewer,Field Supervisor,Fullreviewer,Mopac User,Msb,Msb_Access,Netrma User,Program Manager,Project Manager,SUPERVISOR,Scheduler,Sf Engineering,Supervisoryreviewer,Tech,Test,Warehouse
Admin, Sys (SYSADMIN)	10/05/2009 14:02:36	06/20/2016 10:15:10	Active	ADMINISTRATOR,CCRMA Access,CTRMA Access,Ccrma User,Ctrma User,Director Of Toll Operations,Mopac User,Netrma User,Scheduler,Sf Engineering
Mack, Greg (GMACK)	09/19/2012 16:21:59	06/20/2016 10:17:40	Active	ADMINISTRATOR,CCRMA Access,CTRMA Access,Ccrma User,Ctrma User,Director Of Toll Operations,Netrma User,Warehouse
Newman, Fabiola (FNEWMAN)	04/25/2012 13:51:51	06/20/2016 10:20:27	Active	ADMINISTRATOR,ADMINISTRATOR,AUDITOR,Authority Staff,CCRMA Access,CTRMA Access,Ccrma User,Ctrma User,Field Supervisor

Employee List loaded.

ETC Penetration Statistics

### ETC Penetration Statistics

Revenue Date: 06/20/2016 Turnpike: US290 E

PDF Excel Preview Report

Display 50 records per page

Search:

Time Range	183 Exit		183 Entry		Springdale Exit		Springdale Entry		Giles Exit		Giles Entry		Giles ML		Harris Entry		Harris Exit		Parmer ML		Total	
	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn	Trx	Pn
00:00	18	22.22%	41	29.27%	3	33.33%	1	100.00%	9	33.33%	8	37.50%	111	41.44%	2	0.00%	2	0.00%	100	37.00%	295	36.27%
00:30	16	25.00%	37	35.14%	4	0.00%	1	0.00%	5	40.00%	6	33.33%	84	27.38%	3	0.00%	5	0.00%	78	24.36%	239	26.36%
01:00	13	30.77%	17	47.06%	5	40.00%	0	0.00%	9	11.11%	1	100.00%	59	45.76%	3	66.67%	3	0.00%	42	45.24%	152	42.11%
01:30	16	31.25%	16	18.75%	5	20.00%	1	0.00%	6	16.67%	9	11.11%	65	46.15%	0	0.00%	6	33.33%	52	36.54%	176	35.23%
02:00	14	42.86%	17	41.18%	3	33.33%	1	100.00%	10	30.00%	5	40.00%	56	37.50%	0	0.00%	3	66.67%	41	36.59%	150	38.67%
02:30	9	11.11%	30	43.33%	4	25.00%	1	0.00%	9	33.33%	24	58.33%	57	31.58%	1	100.00%	1	100.00%	42	28.57%	178	35.96%
03:00	7	42.86%	12	41.67%	1	0.00%	1	0.00%	6	16.67%	11	72.73%	39	28.21%	1	100.00%	3	33.33%	41	31.71%	122	35.25%
03:30	15	40.00%	11	27.27%	2	0.00%	0	0.00%	9	22.22%	10	60.00%	30	60.00%	4	75.00%	4	25.00%	28	50.00%	113	46.90%
04:00	14	64.29%	25	68.00%	2	0.00%	1	0.00%	15	46.67%	27	66.67%	65	61.54%	3	33.33%	2	50.00%	67	55.22%	221	58.82%
04:30	20	45.00%	32	43.75%	1	0.00%	5	60.00%	14	35.71%	17	58.82%	90	41.11%	2	0.00%	6	16.67%	91	43.96%	278	42.81%
05:00	29	48.28%	47	59.57%	2	50.00%	0	0.00%	26	57.69%	23	56.52%	172	57.56%	6	50.00%	8	62.50%	164	58.54%	477	57.44%
05:30	62	56.45%	123	48.78%	4	75.00%	7	42.86%	34	44.12%	48	54.17%	396	52.27%	8	62.50%	8	37.50%	321	51.71%	1,011	51.73%
06:00	77	57.14%	174	49.43%	4	50.00%	7	42.86%	38	47.37%	60	60.00%	628	54.30%	11	27.27%	22	54.55%	491	56.01%	1,512	54.23%
06:30	106	63.21%	413	50.61%	27	55.56%	23	56.52%	41	75.61%	100	67.00%	1,225	56.16%	16	56.25%	17	47.06%	737	51.97%	2,705	55.08%
07:00	89	58.43%	546	50.18%	13	53.85%	33	60.61%	33	54.55%	158	58.86%	1,643	55.81%	13	46.15%	17	35.29%	751	54.19%	3,296	54.61%
07:30	123	61.79%	678	53.98%	11	72.73%	49	51.02%	52	67.31%	170	63.53%	1,894	55.86%	14	57.14%	12	75.00%	786	54.96%	3,789	56.08%
08:00	107	63.55%	522	54.98%	7	100.00%	29	55.17%	41	65.85%	119	63.03%	1,491	58.15%	20	45.00%	22	36.36%	698	56.16%	3,056	57.46%
08:30	110	50.00%	520	41.73%	7	28.57%	18	33.33%	46	69.57%	94	64.89%	1,254	52.87%	20	60.00%	23	43.48%	704	55.26%	2,796	51.75%
09:00	124	56.45%	329	52.58%	9	33.33%	11	54.55%	43	67.44%	87	60.92%	795	56.60%	12	50.00%	15	53.33%	523	54.68%	1,948	55.65%
	1,703	55.20%	4,753	51.61%	187	46.52%	237	50.63%	685	54.89%	1,283	61.03%	13,435	54.97%	209	52.15%	248	43.55%	8,343	53.89%	31,083	54.23%

Showing 1 to 48 of 48 records

Previous 1 Next

ETC Penetration StatisticsUS290 E loaded.



Exempt Vehicles

### Exempt Vehicles

#### Organizations

Add Organization

Search

Name
<input type="checkbox"/> 32nd Judicial District Attorney
<input type="checkbox"/> 6th Civil Support Team (WMD)
<input type="checkbox"/> Abernathy Police Department
<input type="checkbox"/> Acadian Ambulance Service
<input type="checkbox"/> Addison Police Department
<input type="checkbox"/> Alamo Colleges Police Department
<input type="checkbox"/> Allegiance Ambulance
<input type="checkbox"/> Allen Police Department
<input type="checkbox"/> Alliance Ambulance, Inc.
<input type="checkbox"/> Alvin Police Department
<input type="checkbox"/> American Medical Response
<input type="checkbox"/> Ameristat Ambulance

#### Exempt Vehicles

Add Exempt Vehicle

Revoke Exempt Vehicle

Upload CSV

Search

State	Plate Number	Start Date	End Date	Active
No matching records found				



Express Lane Extremes

### Express Lane Extremes

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All Segment: All

PDF Excel Preview Report

Segment	Date Interval	TRIP ID	Max Hour Volume	Max Toll Rate	TIME OF MAX HOURLY EL VOLUME
LP1X SB: 2222 to 5th/CVZ	06/20/16	LP1X SB: 2222 to 5th/CVZ	0	\$0.50	
LP1X SB: Parmer to 5th/CVZ	06/20/16	LP1X SB: Parmer to 5th/CVZ	0	\$0.25	

Express Lane Extremes loaded.

Express Lane Traffic Statistics Su...

### Express Lane Traffic Statistics Summary

Start Date: 06/13/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All Segment: All

PDF Excel Preview Report

Day	Segment	GP Volume	EL Volume	Total Volume	Trip Count	EL Percent	EL Revenue	Expected Revenue/Vehicle
06/17/16	LP1X NB: 2222 to Parmar	0.00	0.00	0.00	5		\$5.34	-
06/15/16	LP1X NB: 2222 to Parmar	0.00	0.00	0.00	2		\$2.36	-
06/16/16	LP1X NB: 2222 to Parmar	0.00	0.00	0.00	3		\$3.05	-
06/19/16	LP1X NB: 2222 to Parmar	0.00	0.00	0.00	28		\$14.14	-

Express Lane Traffic Statistics Summary loaded.

Express Lane vs GP Performance

## Express Lane vs GP Performance

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All Segment: All

PDF Excel Preview Report

Display 50 records per page Search:

Segment ID	Date Interval	Direction	GP flow rate	EL Flow Rate	EL SPEED DIFF
LP1X NB: 2222 to Parmar	06/20/16 00:00:00 - 06/20/16 00:03:59	NORTH	75.00	510.00	5.25
LP1X NB: CVZ to 183	06/20/16 00:00:00 - 06/20/16 00:03:59	NORTH	585.00	225.00	9.00
LP1X NB: CVZ to Parmar	06/20/16 00:00:00 - 06/20/16 00:03:59	NORTH	330.00	367.50	6.99
LP1X NB: 2222 to Parmar	06/20/16 00:04:00 - 06/20/16 00:07:59	NORTH	187.50	690.00	3.75
LP1X NB: CVZ to 183	06/20/16 00:04:00 - 06/20/16 00:07:59	NORTH	555.00	180.00	6.75
LP1X NB: CVZ to Parmar	06/20/16 00:04:00 - 06/20/16 00:07:59	NORTH	371.25	435.00	5.25
LP1X NB: 2222 to Parmar	06/20/16 00:08:00 - 06/20/16 00:11:59	NORTH	157.50	465.00	3.50
LP1X NB: CVZ to 183	06/20/16 00:08:00 - 06/20/16 00:11:59	NORTH	435.00	105.00	4.00
LP1X NB: CVZ to Parmar	06/20/16 00:08:00 - 06/20/16 00:11:59	NORTH	296.25	285.00	3.76
LP1X NB: 2222 to Parmar	06/20/16 00:12:00 - 06/20/16 00:15:59	NORTH	82.50	375.00	3.00
LP1X NB: CVZ to 183	06/20/16 00:12:00 - 06/20/16 00:15:59	NORTH	397.50	45.00	4.25
LP1X NB: CVZ to Parmar	06/20/16 00:12:00 - 06/20/16 00:15:59	NORTH	240.00	210.00	3.64
LP1X NB: 2222 to Parmar	06/20/16 00:16:00 - 06/20/16 00:19:59	NORTH	82.50	375.00	3.00
LP1X NB: CVZ to 183	06/20/16 00:16:00 - 06/20/16 00:19:59	NORTH	405.00	30.00	4.00
LP1X NB: CVZ to Parmar	06/20/16 00:16:00 - 06/20/16 00:19:59	NORTH	243.75	202.50	3.51
LP1X NB: 2222 to Parmar	06/20/16 00:20:00 - 06/20/16 00:23:59	NORTH	67.50	210.00	3.00
LP1X NB: CVZ to 183	06/20/16 00:20:00 - 06/20/16 00:23:59	NORTH	367.50	30.00	4.25
LP1X NB: CVZ to Parmar	06/20/16 00:20:00 - 06/20/16 00:23:59	NORTH	217.50	120.00	3.89
LP1X NB: 2222 to Parmar	06/20/16 00:24:00 - 06/20/16 00:27:59	NORTH	172.50	540.00	3.25
LP1X NB: CVZ to 183	06/20/16 00:24:00 - 06/20/16 00:27:59	NORTH	412.50	15.00	4.75

Showing 1 to 50 of 521 records

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Express Lane vs GP Performance loaded.





Failure Summary

### Failure Summary

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

PDF Excel Preview Report

Severity	Ticket Count	Avg Response Time	Avg Repair Time
Critical	9	0 Days, 0 Hours, 4 Minutes	0 Days, 2 Hours, 0 Minutes
Emergency	7	0 Days, 0 Hours, 2 Minutes	0 Days, 2 Hours, 33 Minutes
Warning	33	0 Days, 0 Hours, 2 Minutes	0 Days, 1 Hours, 36 Minutes

Failure Summary loaded.

Fare Schedule Detail Report

### Fare Schedule Detail Report

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All

PDF Excel Preview Report

Display 50 records per page Search:

FareFile ID, Scheduled Start - End

FareFileId: 30294, Scheduled: 06/20/2016 12:00:00 -

Trip Name	Fare Class	SOV		HOV2		HOV3		HOV4	
		AVI	IMG	AVI	IMG	AVI	IMG	AVI	IMG
TripCode 1 - LP1X NB: CVZ to 183, Effective:	2	\$0.25	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TripCode 2 - LP1X NB: CVZ to Parmer, Effective:	2	\$0.25	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TripCode 3 - LP1X NB: 2222 to Parmer, Effective: 06/20/2016 12:00:55	2	\$0.25	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TripCode 4 - LP1X SB: Parmer to 2222, Effective:	2	\$0.25	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TripCode 5 - LP1X SB: Parmer to 5th/CVZ, Effective:	2	\$0.25	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TripCode 6 - LP1X SB: 2222 to 5th/CVZ, Effective:	2	\$0.25	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

- FareFile: 30293, Scheduled: 06/20/2016 11:56:00 - 06/20/2016 11:59:59
- FareFile: 30292, Scheduled: 06/20/2016 11:52:00 - 06/20/2016 11:55:59
- FareFile: 30291, Scheduled: 06/20/2016 11:48:00 - 06/20/2016 11:51:59
- FareFile: 30290, Scheduled: 06/20/2016 11:44:00 - 06/20/2016 11:47:59
- FareFile: 30289, Scheduled: 06/20/2016 11:40:00 - 06/20/2016 11:43:59
- FareFile: 30288, Scheduled: 06/20/2016 11:36:00 - 06/20/2016 11:39:59
- FareFile: 30287, Scheduled: 06/20/2016 11:28:00 - 06/20/2016 11:35:59
- FareFile: 30286, Scheduled: 06/20/2016 10:56:00 - 06/20/2016 11:27:59
- FareFile: 30285, Scheduled: 06/20/2016 10:48:00 - 06/20/2016 10:55:59
- FareFile: 30284, Scheduled: 06/20/2016 10:44:00 - 06/20/2016 10:47:59

Showing 1 to 50 of 170 records



Fleet Usage

### Fleet Usage

Start Date: 06/13/2016 End Date: 06/21/2016 Agency: All

PDF Excel Preview Report

Plaza	Lane	Date	Time	State	Plate	Toll	Image Link
Saline Mainline	2	June 13, 2016	02:54 AM	TX	1066181	\$2.07	
PCM	3	June 13, 2016	03:23 AM	TX	1219489	\$2.02	
SH110 Mainline	2	June 13, 2016	03:25 AM	TX	1166692	\$0.93	
SH110 Mainline	2	June 13, 2016	04:06 AM	TX	1093261	\$0.93	
SH110 Mainline	2	June 13, 2016	05:42 AM	TX	1093261	\$0.93	
FM 756/Paluxy X	2	June 13, 2016	06:14 AM	TX	1271864	\$0.40	
PCM	3	June 13, 2016	06:18 AM	TX	CZY2356	\$2.02	
SH110 Mainline	2	June 13, 2016	06:23 AM	TX	FHL3217	\$0.93	
SH31 Mainline	3	June 13, 2016	06:25 AM	TX	CZY2356	\$1.20	
Saline Mainline	3	June 13, 2016	06:27 AM	TX	CZY2356	\$1.04	
TOTAL						\$12.47	

No data returned.



Inventory Detail

### Inventory Detail

PDF Excel Preview Report

Display 50 records per page

Search:

Location	Equipment Type	Cost Estimate	Warranty End	Serial Number	System ID	Status	Quantity	Comments
Brushy Creek NB Generator Monitoring Station	PULNIX 400			1279	1552	Installed	1	
Brushy Creek NB Generator Monitoring Station	PULNIX STROBE			1248	1574	Installed	1	
Brushy Creek North Bound	MoPac OFIT TEST 1			CRRMA-Cloud-0006	1535	Installed	2	
Brushy Creek North Bound	MoPac OFIT TEST 1			CRRMA-Cloud-0010	1539	Installed	2	
Brushy Creek North Bound	MoPac OFIT TEST 1			CRRMA-Cloud-0011	1540	Installed	2	
Brushy Creek North Bound	MoPac OFIT TEST 1			CRRMA-Cloud-0012	1541	Installed	2	
Brushy Creek North Bound Lane 1 Treadle Strip 3	ZC			1391	1717	Installed	1	
Brushy Creek North Bound Lane 2 Rear VES Strobe	SIRIT			1305	1633	Installed	1	
Brushy Creek South Bound	ZC			1388	1715	Installed	1	
ExitLoopLane10	Pulnix	0		1260	1562	Installed	1	
Far West NB Express Lane Plaza	Smart Sensor	0		2133	1843	Installed	1	
Far West NB Express Lane Plaza	Smart Sensor	0		2134	1844	Installed	1	
Far West NB Express Lane Plaza	Time Server		09-JUN-2016	2201	1808	Installed	1	
Far West NB Express Lane Zone	TestEquipmentType			1	564	NonSerialized	1	
Far West NB Express Lane Zone	TestEquipmentType			22334455	566	In Storage	1	
HostReporter	ALTRONIX			1376	1637	Installed	1	
HostReporter	ALTRONIX			1380	1641	Installed	1	
HostReporter	UPS			1007	1740	Installed	1	
HostReporter	UPS			1913	1731	Installed	1	
HostReporter	UPS			1916	1737	Installed	1	
HostReporter	UPS			1919	1734	Installed	1	

Showing 1 to 50 of 371 records

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Inventory History

### Inventory History

Start Date: 06/01/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All Plaza: All

PDF Excel Preview Report

Id	Equipment Type	Manufacturer Number	Serial Number	Update Time	Status	Who	Qty	Location
564	TestEquipmentType	None	1	01-JUN-2016 09:31	NonSerialized	Carlos	1	WOPAC Facility/LP1 FarWest NB/Far West NB Express Lane Zone
566	TestEquipmentType	113355	22334455	01-JUN-2016 09:38	In Storage	Carlos	1	WOPAC Facility/LP1 FarWest NB/Far West NB Express Lane Zone
1808	Time Server	-	2201	09-JUN-2016 10:24	Installed	Carlos	1	WOPAC Facility/LP1 FarWest NB
1808	Time Server	-	2201	09-JUN-2016 10:25	Installed	Carlos	1	WOPAC Facility/LP1 FarWest NB

Inventory History loaded.



Inventory Summary

## Inventory Summary

PDF | Excel | Preview Report

Display 50 records per page

Search:

Statuses												
Equip ID	Equip Name	Cost Est	Reorder Threshold	In Storage	Broken	Under Repair	Repaired	Installed	Sent to UPD	Return Vendor	Non Serialized	Total
787	24V POWER SUPPLY		0	8	0	0	0	22	0	0	0	30
790	5V Power Supply	0	0	5	0	0	0	4	0	0	0	9
678	ALTRONIX		0	2	0	0	0	5	0	0	0	7
736	ANTENNA		0	0	0	0	0	11	0	0	0	11
779	APC PDU		0	0	0	0	0	10	0	0	0	10
560	BASLER		0	0	0	0	0	3	0	0	0	3
550	Brackets	0	0	0	0	0	0	3	0	0	0	3
637	CISCO		0	0	0	0	0	34	0	0	0	34
1	Coca Cola	100	1	0	1	0	0	0	0	0	0	1
782	DVR		0	0	0	0	0	2	0	0	0	2
733	DVR CAMERA HOUSING		0	1	0	0	0	12	0	0	0	13
742	DVR HOUSING		0	2	0	0	0	32	0	0	0	34
481	Dell Server	40000	1	0	0	0	0	7	0	0	0	7
783	ICS		0	0	0	0	0	7	0	0	0	7
780	KVM	0	0	0	0	0	0	3	0	0	0	3
630	MOXA		0	0	0	0	0	1	0	0	0	1
828	MOXA 5232		0	0	0	0	0	2	0	0	0	2
551	MoPac OFIT TEST 1		0	0	0	0	0	8	0	0	0	8
639	NETBOTZ		0	1	0	0	0	8	0	0	0	9
841	Northstar Card	0	0	2	0	0	0	8	0	0	0	10

Showing 1 to 42 of 42 records

Previous 1 Next

Inventory Summary loaded.

IOPHUB File Exchange

### IOPHUB File Exchange

Revenue Date: 06/20/2016

PDF | Excel | **Preview Report**

Display 50 records per page

Search:

File	File Control #	File Name	File Type	File Date	Record Count	File Size
	669886	IOP_IOPHUB_CTRMA_20160620_010921_000669886.STA	INCR	06/20/2016 01:09:21 AM	2,749	206,832
	669888	IOP_IOPHUB_CTRMA_20160620_013419_000669888.STA	INCR	06/20/2016 01:34:19 AM	56	3,849
	669887	IOP_IOPHUB_CTRMA_20160620_013554_000669887.STA	INCR	06/20/2016 01:35:54 AM	2,479	191,008
	669889	IOP_IOPHUB_CTRMA_20160620_014031_000669889.STA	INCR	06/20/2016 01:40:31 AM	2,707	203,457
	669890	IOP_IOPHUB_CTRMA_20160620_020619_000669890.STA	INCR	06/20/2016 02:06:19 AM	3,272	247,008
	669891	IOP_IOPHUB_CTRMA_20160620_022444_000669891.STA	INCR	06/20/2016 02:24:44 AM	2,459	184,310
	669893	IOP_IOPHUB_CTRMA_20160620_023407_000669893.STA	INCR	06/20/2016 02:34:07 AM	76	5,232
	669892	IOP_IOPHUB_CTRMA_20160620_023838_000669892.STA	INCR	06/20/2016 02:38:38 AM	1,706	128,335
	669894	IOP_IOPHUB_CTRMA_20160620_030556_000669894.STA	INCR	06/20/2016 03:05:56 AM	857	64,627
	669895	IOP_IOPHUB_CTRMA_20160620_032903_000669895.STA	INCR	06/20/2016 03:29:03 AM	2,641	203,526
	669897	IOP_IOPHUB_CTRMA_20160620_033435_000669897.STA	INCR	06/20/2016 03:34:35 AM	110	7,517
	669896	IOP_IOPHUB_CTRMA_20160620_033806_000669896.STA	INCR	06/20/2016 03:38:06 AM	3,472	261,182
	669898	IOP_IOPHUB_CTRMA_20160620_040614_000669898.STA	INCR	06/20/2016 04:06:14 AM	1,483	111,618
	669899	IOP_IOPHUB_CTRMA_20160620_084842_000669899.STA	FULL	06/20/2016 08:48:42 AM	3,165,640	200,579,563
	669882	IOP_IOPHUB_CTRMA_20160620_000906_000669882.STA	INCR	06/20/2016 12:09:06 AM	3,611	271,450
	669885	IOP_IOPHUB_CTRMA_20160620_003618_000669885.STA	INCR	06/20/2016 12:36:18 AM	75	5,084
	669883	IOP_IOPHUB_CTRMA_20160620_004214_000669883.STA	INCR	06/20/2016 12:42:14 AM	3,191	240,019
	669884	IOP_IOPHUB_CTRMA_20160620_004916_000669884.STA	INCR	06/20/2016 12:49:16 AM	2,432	182,272

Showing 1 to 18 of 18 records

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Lane Fare Schedule

## Lane Fare Schedule

Revenue Date:  Turnpike:  Plaza:  Lane:

Display  records per page Search:

Plaza ID	Plaza	Lane	Open Date	Close Date	Class	Fare	Discount	Zero Flag	File Name
31	183 Entry	1	06/18/2016 01:00:00	06/18/2016 01:00:00	2	\$0.65	\$0.55	N	
31	183 Entry	1	06/18/2016 01:00:00	06/18/2016 01:00:00	3	\$1.30	\$1.10	N	
31	183 Entry	1	06/18/2016 01:00:00	06/18/2016 01:00:00	4	\$1.96	\$1.65	N	
31	183 Entry	1	06/18/2016 01:00:00	06/18/2016 01:00:00	5	\$2.61	\$2.20	N	
31	183 Entry	1	06/18/2016 01:00:00	06/18/2016 01:00:00	6	\$3.26	\$2.75	N	
31	183 Entry	1	06/19/2016 01:00:00	06/19/2016 01:00:00	2	\$0.65	\$0.55	N	
31	183 Entry	1	06/19/2016 01:00:00	06/19/2016 01:00:00	3	\$1.30	\$1.10	N	
31	183 Entry	1	06/19/2016 01:00:00	06/19/2016 01:00:00	4	\$1.96	\$1.65	N	
31	183 Entry	1	06/19/2016 01:00:00	06/19/2016 01:00:00	5	\$2.61	\$2.20	N	
31	183 Entry	1	06/19/2016 01:00:00	06/19/2016 01:00:00	6	\$3.26	\$2.75	N	
31	183 Entry	1	06/20/2016 01:00:00		2	\$0.65	\$0.55	N	
31	183 Entry	1	06/20/2016 01:00:00		3	\$1.30	\$1.10	N	
31	183 Entry	1	06/20/2016 01:00:00		4	\$1.96	\$1.65	N	
31	183 Entry	1	06/20/2016 01:00:00		5	\$2.61	\$2.20	N	
31	183 Entry	1	06/20/2016 01:00:00		6	\$3.26	\$2.75	N	
31	183 Entry	2	06/18/2016 00:07:16	06/18/2016 00:45:06	2	\$0.65	\$0.55	N	
31	183 Entry	2	06/18/2016 00:07:16	06/18/2016 00:45:06	3	\$1.30	\$1.10	N	
31	183 Entry	2	06/18/2016 00:07:16	06/18/2016 00:45:06	4	\$1.96	\$1.65	N	
31	183 Entry	2	06/18/2016 00:07:16	06/18/2016 00:45:06	5	\$2.61	\$2.20	N	
31	183 Entry	2	06/18/2016 00:07:16	06/18/2016 00:45:06	6	\$3.26	\$2.75	N	

Showing 1 to 50 of 2,420 records





Lane File Transfer History

### Lane File Transfer History

Revenue Date: 06/20/2016 Turnpike: All Plaza: All Lane: All

PDF Excel Preview Report

File Description	File Name	Transfer Date Time	Status
TAG	/usr/local/etc/trx/plc/tag/20160620052923.gz	06/20/2016 05:45	TRANSFERED
TAG	/usr/local/etc/trx/plc/tag/20160620052923.gz	06/20/2016 06:00	LOADED
TAG	/usr/local/etc/trx/plc/tag/20160620052923.gz	06/20/2016 06:01	LOADED

Lane File Transfer History loaded.



Lane Image Tool

Lane Image Tool

Start Date: 06/20/2016 Start Time: 08:00 End Date: 06/21/2016 End Time: 08:10

Turnpike: US290 E Plaza: 183 Exit Lane: All Codeoff: All Plaza Trx ID:

PDF Excel Preview Report

Display 50 records per page

Search:

Lane Mode	Coll	Trx DateTime	Img	Trx Flag	Plaza	Ln	Trx ID	Pl Trx ID	Axle			Fare		Act	Acq Time	Spd	Strd	Vio	OCR Info	Tag		
									Fwd	Rev	Ind	Exp	Act							Tag Id	Stat	Handshake
ORT	0	06/20/16 08:00:27.505924		0	183 Exit	4	4910346	692301967	2	0	2	\$0.55	AVI	06/20/16 08:00:26.913	66	N	N		TEX.02891006	G	7.0.0	NA
ORT	0	06/20/16 08:00:41.306000		0	183 Exit	5	4910347	692302087	3	0		\$1.30		06/20/16 08:00:40.444	52	N	Y		HCTR08139102	I	2.0.0	NA
ORT	0	06/20/16 08:00:55.269100		0	183 Exit	3	4910348	692302189	3	0	2	\$1.10	AVI	06/20/16 08:00:54.364	56	N	N		TEX.01891895	G	3.0.0	NA
ORT	0	06/20/16 08:01:25.896000		0	183 Exit	4	4910349	692302507	2	0		\$0.65		06/20/16 08:01:25.323	64	N	Y				0.0.0	NA
ORT	0	06/20/16 08:01:30.296000		0	183 Exit	5	4910350	692302541	2	0		\$0.65		06/20/16 08:01:29.754	69	N	Y				0.0.0	NA
ORT	0	06/20/16 08:01:41.766000		0	183 Exit	4	4910351	692302621	2	0	2	\$0.55	AVI	06/20/16 08:01:41.224	69	N	N		TEX.00492447	G	3.0.0	NA
ORT	0	06/20/16 08:02:55.966000		0	183 Exit	5	4910352	692303905	2	0		\$0.65		06/20/16 08:02:55.514	79	N	Y				0.0.0	NA
ORT	0	06/20/16 08:03:01.455935		0	183 Exit	4	4910353	692303906	2	0	2	\$0.55	AVI	06/20/16 08:03:01.003	77	N	N		HCTR06493227	G	2.0.0	NA
ORT	0	06/20/16 08:03:05.846000		0	183 Exit	5	4910354	692303907	2	0	2	\$0.55	AVI	06/20/16 08:03:05.334	70	N	N		HCTR05990964	G	4.0.0	NA
ORT	0	06/20/16 08:03:19.906000		0	183 Exit	4	4910355	692303908	5	0	2	\$2.20	AVI	06/20/16 08:03:18.744	56	N	N		TEX.02066835	G	5.0.0	NA
ORT	0	06/20/16 08:04:17.086000		0	183 Exit	4	4910356	692304287	2	0	2	\$0.55	AVI	06/20/16 08:04:16.484	62	N	N		DNT.07878554	G	2.0.0	NA
ORT	0	06/20/16 08:04:26.655918		0	183 Exit	4	4910357	692304383	4	0	2	\$1.65	AVI	06/20/16 08:04:25.923	71	N	N		TEX.01669336	G	4.0.0	NA
ORT	0	06/20/16 08:04:31.316000		0	183 Exit	4	4910358	692304458	2	0	2	\$0.55	AVI	06/20/16 08:04:30.784	68	N	N		TEX.03171390	G	5.0.0	NA
ORT	0	06/20/16 08:04:47.306000		0	183 Exit	5	4910359	692304596	2	0	2	\$0.55	AVI	06/20/16 08:04:46.799	77	N	N		TEX.02874178	G	4.0.0	NA

Showing 1 to 50 of 1,089 records

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Lane Image Tool loaded.

Lane Performance

### Lane Performance

Start Date: 06/20/2016 | Start Time: 00:00 | End Date: 06/21/2016 | End Time: 23:59

PDF | Excel | Preview Report

Display 50 records per page | Search:

Plaza	Lane	Open Normal	Close Normal	Open Degrade	Close Degrade
Park Street Mainline	Lane 1	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 2	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 3	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 4	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 5	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 6	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 7	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 8	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 9	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 10	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 11	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 12	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 13	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 14	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 15	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 16	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 17	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Park Street Mainline	Lane 18	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Lakeline Plaza NB	Lane 1	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes
Lakeline Plaza NB	Lane 2	2 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes	0 Days, 0 Hours, 0 Minutes

Showing 1 to 50 of 197 records

Previous | 1 | 2 | 3 | 4 | Next

Lane Performance loaded



Please enter Username and Password to sign in to CTRMA Host Reports.

Username

Password



Maintenance Detail

Maintenance Detail

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

PDF Excel Preview Report

Display 50 records per page

Search:

Ticket	Severity	Name	Location	Description	Detected	Dispatched	Acknowledged	Resolved	Closed
142895	Warning	Vehicle Entry and Exit Too Far Apart	NetRMA Facility\PCM\PCM NB-SB Zone\Lane2	<a href="https://wiki.tolling.telvent.com/display/MAINT/Vehicle+Entry+And+Exit+Too+Far+Apart++CTRMA">https://wiki.tolling.telvent.com/display/MAINT/Vehicle+Entry+And+Exit+Too+Far+Apart++CTRMA</a>	ROMS ENGINE --- 20-JUN-16 11.11.56.724000 AM --- Detected by ROMS engine event scanner	ROMS ENGINE --- 20-JUN-16 11.12.34.391000 AM --- Dispatched by Notifier application	Christopher Dyck --- 20-JUN-16 11.14.14.195982 AM --- Update performed via ROMS client program.		
142894	Emergency	PING	NetRMA Facility\PCM\PCM NB-SB Zone\Lane1\Lane1FrontCamera	<a href="https://wiki.tolling.telvent.com/display/MAINT/Ping+Critical++CTRMA">https://wiki.tolling.telvent.com/display/MAINT/Ping+Critical++CTRMA</a>	ROMS ENGINE --- 20-JUN-16 11.05.55.827000 AM --- Detected by ROMS engine event scanner	ROMS ENGINE --- 20-JUN-16 11.06.55.384000 AM --- Dispatched by Notifier application	Christopher Dyck --- 20-JUN-16 11.08.38.766682 AM --- Update performed via ROMS client program.		
142893	Warning	Too Many Consecutive Violations	NetRMA Facility\Saline Creek\Saline Creek Mainline Zone\Lane 2	<a href="https://wiki.tolling.telvent.com/display/MAINT/Too+Many+Consecutive+Violations++CTRMA">https://wiki.tolling.telvent.com/display/MAINT/Too+Many+Consecutive+Violations++CTRMA</a>	ROMS ENGINE --- 20-JUN-16 11.02.18.541000 AM --- Detected by ROMS engine event scanner	ROMS ENGINE --- 20-JUN-16 11.02.55.397000 AM --- Dispatched by Notifier application	Christopher Dyck --- 20-JUN-16 11.04.49.452612 AM --- Update performed via ROMS client program.		Christopher Dyck --- 20-JUN-16 11.07.17.947106 AM --- Closing ticket to monitor for further issues.
142892	Warning	Too Many Consecutive Violations	NetRMA Facility\PCM\PCM NB-SB Zone\Lane3	<a href="https://wiki.tolling.telvent.com/display/MAINT/Too+Many+Consecutive+Violations++CTRMA">https://wiki.tolling.telvent.com/display/MAINT/Too+Many+Consecutive+Violations++CTRMA</a>	ROMS ENGINE --- 20-JUN-16 10.32.23.609000 AM --- Detected by ROMS engine event scanner	ROMS ENGINE --- 20-JUN-16 10.32.41.920000 AM --- Dispatched by Notifier application	Christopher Dyck --- 20-JUN-16 10.34.14.929683 AM --- Update performed via ROMS client program.		Christopher Dyck --- 20-JUN-16 11.07.23.235408 AM --- Closing ticket to monitor for further issues.
142891	Warning	Too Many Consecutive Violations	NetRMA Facility\SH31 Mainline \SH31 Mainline Front Camera	<a href="https://wiki.tolling.telvent.com/display/MAINT/Too+Many+Consecutive+Violations++CTRMA">https://wiki.tolling.telvent.com/display/MAINT/Too+Many+Consecutive+Violations++CTRMA</a>	ROMS ENGINE --- 20-JUN-16 10.32.23.609000 AM --- Detected by ROMS engine event scanner	ROMS ENGINE --- 20-JUN-16 10.32.41.920000 AM --- Dispatched by Notifier application	Christopher Dyck --- 20-JUN-16 10.34.14.929683 AM --- Update performed via ROMS client program.		Christopher Dyck --- 20-JUN-16 11.07.23.235408 AM --- Closing ticket to monitor for further issues.

Showing 1 to 50 of 52 records

Previous 1 2 Next

Maintenance Summary

## Maintenance Summary

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

PDF Excel Preview Report

Display 50 records per page

Search:

ID	Detected Time	Last Update Time	Name	Severity	Assigned Tech	Location
142895	06/20/16 11:11	06/20/16 11:14	Vehicle Entry and Exit Too Far Apart	Warning	Christopher Dyck	NetRMA Facility\Prairie Creek Mainline Plaza\Prairie Creek Mainline Zone\Lane2
142894	06/20/16 11:05	06/20/16 11:08	PING	Emergency	Christopher Dyck	NetRMA Facility\Prairie Creek Mainline Plaza\Prairie Creek Mainline Zone\Lane1\Front Camera
142893	06/20/16 11:02	06/20/16 11:07	Too Many Consecutive Violations	Warning	Christopher Dyck	NetRMA Facility\Saline Creek Mainline Plaza\Saline Creek Mainline Zone\Lane 2
142892	06/20/16 10:32	06/20/16 11:07	Too Many Consecutive Violations	Warning	Christopher Dyck	NetRMA Facility\Prairie Creek Mainline Plaza\Prairie Creek Mainline Zone\Lane3
142891	06/20/16 10:27	06/20/16 11:07	Too Many Consecutive Violations	Warning	Christopher Dyck	NetRMA Facility\SH31 Mainline Plaza\SH31 Mainline Zone\Lane 2
142890	06/20/16 10:20	06/20/16 11:07	Camera Has Failed	Warning	Christopher Dyck	CCRMA Facility\SH550 Old Alice Rd E NB Plaza\SH550 Old Alice Rd NB Zone\Lane 2\Front Camera
142889	06/20/16 10:16	06/20/16 11:07	Too Many Consecutive Violations	Warning	Christopher Dyck	NetRMA Facility\SH64 NB Plaza\SH64 NB Zone\Lane2
142888	06/20/16 10:12	06/20/16 11:07	Too Many Consecutive Violations	Warning	Christopher Dyck	NetRMA Facility\Saline Creek Mainline Plaza\Saline Creek Mainline Zone\Lane 3
142887	06/20/16 10:07	06/20/16 11:06	Vehicle Entry and Exit Too Far Apart	Warning	Christopher Dyck	NetRMA Facility\Prairie Creek Mainline Plaza\Prairie Creek Mainline Zone\Lane2
142886	06/20/16 10:07	06/20/16 11:06	Vehicle Entry and Exit Too Far Apart	Warning	Christopher Dyck	NetRMA Facility\Prairie Creek Mainline Plaza\Prairie Creek Mainline Zone\Lane3
142885	06/20/16 09:47	06/20/16 11:06	PING	Emergency	Christopher Dyck	NetRMA Facility\Prairie Creek Mainline Plaza\Prairie Creek Mainline Zone\Lane1\Front Camera
142884	06/20/16 08:52	06/20/16 09:48	Vehicle Entry and Exit Too Far Apart	Warning	Christopher Dyck	NetRMA Facility\Prairie Creek Mainline Plaza\Prairie Creek Mainline Zone\Lane3
142883	06/20/16 08:30	06/20/16 09:48	Camera Comm Failure	Critical	Christopher Dyck	I290E Facility\Giles Mainline Plaza\Giles Mainline WB Zone\Lane11\Rear Camera
142882	06/20/16 08:30	06/20/16 09:47	Camera Comm Failure	Critical	Christopher Dyck	I290E Facility\Giles Mainline Plaza\Giles Mainline WB Zone\Lane11\Front Camera
142881	06/20/16 08:21	06/20/16 09:47	APC UPS	Warning	Christopher Dyck	NetRMA Facility\SH64 NB Plaza\SH64 NB ILP\SH64 NB Cabinet\SH64 NB UPS 2
142880	06/20/16 08:04	06/20/16 09:47	Vehicle Entry and Exit Too Far Apart	Warning	Christopher Dyck	V183A Facility\Lakeline Plaza South Bound\Lakeline Plaza South Bound ORT Zone\Lakeline Plaza South Bound Lane 2
142879	06/20/16 08:04	06/20/16 09:47	Vehicle Entry and Exit Too Far Apart	Warning	Christopher Dyck	V183A Facility\Lakeline Plaza South Bound\Lakeline Plaza South Bound ORT Zone\Lakeline Plaza South Bound Lane 3
142878	06/20/16 07:42	06/20/16 11:06	Too Many Double Tag Reads	Warning	Christopher Dyck	V183A Facility\Park Street Mainline\Park Street Mainline SB Zone\PSM-SB-ZC2\PaymentRP

Showing 1 to 50 of 52 records

Previous 1 2 Next



- Administration
- Report Manager
  - Audit Reports
  - CSC Reports
  - File Exchange Reports
  - Plaza Administration
  - Program Reports
  - ROMS Reports
  - Revenue Reports
  - Traffic Reports
  - Trip Reports
  - Violation Reports

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OCR Diagnostics

### OCR Diagnostics

Start Date: 06/19/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All Plaza: All

PDF Excel Preview Report

Trx Count	Image Count	Image Per Trx	Average Confidence
102	119	1	68.93%

OCR Diagnostics loaded



Pending Transaction Stages Re...

### Pending Transaction Stages Report

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All

PDF Excel Preview Report

Txn Date	Facility	Tolling Point	Hour	Total Txn Cnt	Tag Txn Cnt	Image Txn Cnt	Matched Cnt	Assembled Cnt	Pending Cnt
06/20/2016	MOPAC -- FWN	FWN	0	1	0	1	0	0	1
06/20/2016	MOPAC -- FWN	FWN	8	1	1	0	0	0	1
06/20/2016	MOPAC -- FWN	FWN	10	2	2	0	0	0	2
<b>Total</b>				<b>4</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>



Plaza Transaction Detail

### Plaza Transaction Detail

Revenue Date: 06/20/2016 Turnpike: 183-A Plaza: Park Street Mainline Select reporting range: Revenue Day

PDF Excel Preview Report

Plaza	Lane	Date	AVI Count					Vio Count					AVI Revenue					Vio Revenue					Total						
			2	3	4	5	6	Total	2	3	4	5	6	Total	2	3	4	5	6	Total	Count	Rev							
MainLine Plaza	5	06/20/2016	0	0	0	0	0	0	1	0	0	0	0	0	1	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.73	\$0.00	\$0.00	\$0.00	\$0.00	\$1.73	1	\$1.73
MainLine Plaza	6	06/20/2016	2,233	88	54	45	5	2,425	1,417	51	38	36	0	1,542	\$3,260.18	\$256.96	\$236.52	\$262.80	\$36.50	\$4,052.96	\$2,451.41	\$176.46	\$197.60	\$249.48	\$0.00	\$3,074.95	3,967	\$7,127.91	
MainLine Plaza	7	06/20/2016	1,535	33	34	43	3	1,648	1,165	28	29	21	1	1,244	\$2,241.10	\$96.36	\$148.92	\$251.12	\$21.90	\$2,759.40	\$2,015.45	\$96.88	\$150.80	\$145.53	\$8.66	\$2,417.32	2,892	\$5,176.72	
MainLine Plaza	8	06/20/2016	465	7	6	2	0	480	393	2	8	0	0	403	\$678.90	\$20.44	\$26.28	\$11.68	\$0.00	\$737.30	\$679.89	\$6.92	\$41.60	\$0.00	\$0.00	\$728.41	883	\$1,465.71	
MainLine Plaza	9	06/20/2016	0	0	0	0	0	0	1	0	0	0	0	1	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1.73	\$0.00	\$0.00	\$0.00	\$1.73	1	\$1.73		
MainLine Plaza	11	06/20/2016	2,196	4	7	1	1	2,209	1,380	2	5	0	0	1,387	\$3,206.16	\$11.68	\$30.66	\$5.84	\$7.30	\$3,261.64	\$2,387.40	\$6.92	\$26.00	\$0.00	\$0.00	\$2,420.32	3,596	\$5,681.96	
MainLine Plaza	12	06/20/2016	4,021	26	40	47	2	4,136	2,249	26	28	34	4	2,341	\$5,870.66	\$75.92	\$175.20	\$274.48	\$14.60	\$6,410.86	\$3,890.77	\$89.96	\$145.60	\$235.62	\$34.64	\$4,396.59	6,477	\$10,807.45	
MainLine Plaza	13	06/20/2016	2,718	72	57	42	8	2,897	1,625	35	37	31	5	1,733	\$3,968.28	\$210.24	\$249.66	\$245.28	\$58.40	\$4,731.86	\$2,811.25	\$121.10	\$192.40	\$214.83	\$43.30	\$3,382.88	4,630	\$8,114.74	
MainLine Plaza	14	06/20/2016	0	0	0	0	0	0	2	0	0	0	0	2	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.46	\$0.00	\$0.00	\$0.00	\$3.46	2	\$3.46		
<b>Total</b>			<b>13,168</b>	<b>230</b>	<b>198</b>	<b>180</b>	<b>19</b>	<b>13,795</b>	<b>8,233</b>	<b>144</b>	<b>145</b>	<b>122</b>	<b>10</b>	<b>8,654</b>	<b>\$19,225.28</b>	<b>\$671.60</b>	<b>\$867.24</b>	<b>\$1,051.20</b>	<b>\$138.70</b>	<b>\$21,954.02</b>	<b>\$14,243.09</b>	<b>\$498.24</b>	<b>\$754.00</b>	<b>\$845.46</b>	<b>\$86.60</b>	<b>\$16,427.39</b>	<b>22,449</b>	<b>\$38,381.41</b>	

Plaza Violation Details

### Plaza Violation Details

Revenue Date: 08/20/2016 | Turnpike: US290 E | Plaza: All | Select reporting range: Revenue Day

PDF | Excel | Preview Report

Display 50 records per page | Search:

Plaza	Lane	AVI Total	PBM Total	AVI %	PBM %	Total
183 Entry	1	0	1	0.00%	100.00%	1
183 Entry	2	315	353	47.16%	52.84%	668
183 Entry	3	1677	1440	53.80%	46.20%	3117
183 Entry	4	498	521	48.87%	51.13%	1019
183 Exit	1	0	1	0.00%	100.00%	1
183 Exit	2	1	5	16.67%	83.33%	6
183 Exit	3	56	62	47.46%	52.54%	118
183 Exit	4	395	327	54.71%	45.29%	722
183 Exit	5	510	392	56.54%	43.46%	902
GLR-EB	2	380	315	54.68%	45.32%	695
GLR-WB	2	792	508	60.92%	39.08%	1300
GM	1	0	1	0.00%	100.00%	1
GM	2	16	22	42.11%	57.89%	38
GM	3	578	575	50.13%	49.87%	1153
GM	4	828	733	53.04%	46.96%	1561
GM	5	258	253	50.49%	49.51%	511
GM	6	0	4	0.00%	100.00%	4
GM	8	1446	1219	54.26%	45.74%	2665
GM	9	2606	1799	59.16%	40.84%	4405
GM	10	1698	1460	53.77%	46.23%	3158
GM	11	59	63	48.36%	51.64%	122

Showing 1 to 32 of 32 records

Plaza Violation Details loaded.

Rate File Display Report

### Rate File Display Report

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

PDF Excel Preview Report

Display 50 records per page

Search:

Fare File Name	Trip Fare ID	Rate Sign Code	Primary Rate	File Loaded Timestamp	Scheduled Effective Time	Scheduled Expiry Time	Trip Fare effective Time	Trip Fare Expiration Time	Sign Display Time	Effective Time Lag	Override
20160620120034321_TOLL.XML	125498	MOPACNB01A	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125498	MOPACNB02A	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125499	MOPACNB03A	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00		06/20/2016 12:00:55		06/20/2016 12:00:55	+000000000 00:00:55.035104000	No
20160620120034321_TOLL.XML	125500	MOPACSB01B	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125500	MOPACSB01B	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125501	MOPACSB01A	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125502	MOPACSB02A	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125503	MOPACNB02B	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125503	MOPACNB01B	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125503	MOPACNB02B	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620120034321_TOLL.XML	125503	MOPACNB01B	\$0.25	06/20/2016 12:00:34	06/20/2016 12:00:00						No
20160620115634204_TOLL.XML	125492	MOPACNB01A	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125492	MOPACNB02A	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125493	MOPACNB03A	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59	06/20/2016 11:56:50	06/20/2016 12:00:55	06/20/2016 11:56:50	+000000000 00:00:50.035539000	No
20160620115634204_TOLL.XML	125494	MOPACSB01B	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125494	MOPACSB01B	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125495	MOPACSB01A	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125496	MOPACSB02A	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125497	MOPACNB02B	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125497	MOPACNB01B	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No
20160620115634204_TOLL.XML	125497	MOPACNB02B	\$0.25	06/20/2016 11:56:35	06/20/2016 11:56:00	06/20/2016 11:59:59					No

Showing 1 to 50 of 1,870 records

Reconciliation Summary

## Reconciliation Summary

Turnpike: 183-A | Agency: TxDOT | Year: 2016

PDF | Excel | **Preview Report**

Display 50 records per page

Search:

Turnpike	Month	Lane			AVI				Image Review				Filters		Non Revenue				
		AVI	PBM	Total	Toll	Toll %	I-Toll	I-Toll %	True Penetration	Pending Image	MSB Images Sent	MSB Images Received	Delta	PBM Filtered Duplicates	Buffered Tag Reads	NR	NR %	Preventable	Preventable
183-A	Jan	2,342,708	1,582,478	3,925,186	2,336,781	59.53%	292,390	7.45%	66.98%	270	1,588,123	1,587,515	608	684	0	39,826	2.52%	24,428	1
183-A	Feb	2,374,163	1,562,924	3,937,087	2,368,181	60.15%	274,587	6.97%	67.12%	13	1,568,768	1,568,757	11	648	0	40,463	2.59%	29,096	1
183-A	Mar	2,550,883	1,713,727	4,264,610	2,542,911	59.63%	319,713	7.50%	67.13%	22	1,721,666	1,721,644	22	545	0	43,860	2.56%	34,301	2
183-A	Apr	2,531,372	1,676,071	4,207,443	2,521,155	59.92%	296,981	7.06%	66.98%	22	1,682,715	1,682,697	18	533	0	42,033	2.51%	34,598	2
183-A	May	2,562,997	1,695,074	4,258,071	2,515,412	59.07%	298,526	7.01%	66.08%	368	1,706,605	1,706,587	18	1,820	0	40,803	2.41%	36,079	2
183-A	Jun	1,614,630	1,077,950	2,692,580	1,554,236	57.72%	94,785	3.52%	61.24%	99	1,042,969	654,687	388,282	163	0	13,530	1.26%	13,143	1
183-A	Jul	0	0	0	0	0.00%	0	0.00%	0.00%	0	0	0	0	0	0	0	0.00%	0	0
183-A	Aug	0	0	0	0	0.00%	0	0.00%	0.00%	0	0	0	0	0	0	0	0.00%	0	0
183-A	Sep	0	0	0	0	0.00%	0	0.00%	0.00%	0	0	0	0	0	0	0	0.00%	0	0
183-A	Oct	0	0	0	0	0.00%	0	0.00%	0.00%	0	0	0	0	0	0	0	0.00%	0	0
183-A	Nov	0	0	0	0	0.00%	0	0.00%	0.00%	0	0	0	0	0	0	0	0.00%	0	0
183-A	Dec	0	0	0	0	0.00%	0	0.00%	0.00%	0	0	0	0	0	0	0	0.00%	0	0

Showing 1 to 12 of 12 records

Previous | **1** | Next



Role Management

### Role Management

Users Roles Permissions

ACL ELCC Host ROMS VIP VPS

Active Users

Search

	Username	Active	Collector Key
<input type="checkbox"/>	ABURROLA	Y	-
<input type="checkbox"/>	AHERRERA	Y	-
<input type="checkbox"/>	AKEATING	Y	-
<input type="checkbox"/>	ANGUYEN	Y	-
<input type="checkbox"/>	ARINCONES	Y	-
<input type="checkbox"/>	ARINCONES@CCRMA.ORG	Y	-
<input type="checkbox"/>	ATAYLOR	Y	-
<input type="checkbox"/>	BBLACK	Y	-
<input type="checkbox"/>	BCALLURU	Y	1121
<input type="checkbox"/>	BCLEVEN	Y	-

Roles Assigned

No matching records found

Roles Available

No matching records found



Summary Of Operations

## Summary Of Operations

Turnpike: All Segment: All Month: JUN-16

PDF Excel **Preview Report**

Month Statistics	NorthBound	SouthBound
LP1X NB: 2222 to Parmer	82	
TOTAL	82	

PRICING	NorthBound	SouthBound
AVI	78	
PBM	28	
RANGE	\$0 - 25	
TOTALREV	106	

Trip Name	Average Weekday Toll	Average Weekend Toll	Average Morning Peak Toll	Average Afternoon Peak Toll	Average Off Peak Toll
EB_US_290_FRONT	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
EB_US_290_LANES	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
LP1X NB: 2222 to Parmer	\$0.83	\$0.25	\$0.63	\$1.23	\$1.08
LP1X NB: CVZ to 183	\$0.55	\$0.23	\$0.58	\$1.06	\$0.76
LP1X NB: CVZ to Parmer	\$0.55	\$0.23	\$0.58	\$1.06	\$0.76
LP1X SB: 2222 to 5th/CVZ	\$0.55	\$0.23	\$0.58	\$1.06	\$0.76
LP1X SB: Parmer to 2222	\$0.55	\$0.23	\$0.58	\$1.06	\$0.76
LP1X SB: Parmer to 5th/CVZ	\$0.55	\$0.23	\$0.58	\$1.06	\$0.76
WB_US_290_FRONT	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
WB_US_290_LANES	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

	NorthBound	SouthBound	NorthBound	SouthBound
Volume	Average Weekday	Average Weekday	Average Weekend	Average Weekend
EL	0.00	0.00	0.00	0.00
GE	0.00	0.00	0.00	0.00





Toll Rate File Transmission

### Toll Rate File Transmission

Start Date:  End Date:

Display  records per page Search:

Rate File Name	Source	Destination	Transmission Date	Transmission Status	Type
20160620000034155_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:00:35	Completed	Toll Module Toll Rate File
20160620000434128_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:04:34	Completed	Toll Module Toll Rate File
20160620000834119_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:08:35	Completed	Toll Module Toll Rate File
20160620001234111_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:12:35	Completed	Toll Module Toll Rate File
20160620001634158_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:16:36	Completed	Toll Module Toll Rate File
20160620002034101_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:20:35	Completed	Toll Module Toll Rate File
20160620002434131_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:24:34	Completed	Toll Module Toll Rate File
20160620002834134_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:28:35	Completed	Toll Module Toll Rate File
20160620003234117_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:32:34	Completed	Toll Module Toll Rate File
20160620003634113_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:36:35	Completed	Toll Module Toll Rate File
20160620004034159_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:40:35	Completed	Toll Module Toll Rate File
20160620004434111_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:44:36	Completed	Toll Module Toll Rate File
20160620004834141_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:48:35	Completed	Toll Module Toll Rate File
20160620005234121_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:52:34	Completed	Toll Module Toll Rate File
20160620005634118_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 00:56:35	Completed	Toll Module Toll Rate File
20160620010034187_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 01:00:34	Completed	Toll Module Toll Rate File
20160620010434166_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 01:04:35	Completed	Toll Module Toll Rate File
20160620010834178_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 01:08:34	Completed	Toll Module Toll Rate File
20160620011234141_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 01:12:36	Completed	Toll Module Toll Rate File
20160620011634127_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 01:16:35	Completed	Toll Module Toll Rate File
20160620012034125_TOLL.XML	MOPAC ITS	MOPAC PHS	06/20/2016 01:20:34	Completed	Toll Module Toll Rate File

Showing 1 to 50 of 158 records

Transaction Disposition

### Transaction Disposition

Start Date: 06/20/2016 | End Date: 06/21/2016 | Turnpike: All | Agency: All

PDF | Excel | **Preview Report**

Agency	Disposition	Status ID	AVI Flag	Trx Count	Toll Amount	Description
N/A	Not Submitted		AVI	45,905	\$47,137.57	Not Submitted
N/A	Not Submitted		NON-AVI	46,174	\$51,152.15	Not Submitted
<b>Totals:</b>	<b>Totals:</b>			<b>92,079</b>	<b>\$98,290</b>	

Disposition	Status ID	Description	Trx Count	Toll Amount
Not Submitted		Not Submitted	92,079	\$98,289.72
<b>Totals:</b>			<b>92,079</b>	<b>92,079</b>

Transaction Disposition loaded.

Transaction Summary

### Transaction Summary

Revenue Date: 06/20/2016 Turnpike: US290 E Plaza: All Select reporting range: Revenue Day

PDF Excel Preview Report

Plaza		AVI Count					Total	PBM Count					Total	
Plaza	Date	2	3	4	5	6	Total	2	3	4	5	6	Total	Count
183 Entry	06/20	2,218	107	48	71	2	2,446	2,090	90	40	67	4	2,291	4,737
183 Exit	06/20	802	52	21	43	5	923	627	56	26	43	9	761	1,684
GLR-EB	06/20	211	85	33	33	9	371	160	70	39	33	5	307	678
GLR-WB	06/20	581	142	2	51	0	776	351	107	10	27	0	495	1,271
GM	06/20	6,989	121	94	118	23	7,345	5,736	66	90	113	14	6,019	13,364
HBP-EB	06/20	57	28	3	20	1	109	46	25	4	25	0	100	209
HBP-WB	06/20	69	15	3	20	1	108	97	17	7	17	0	138	246
PM	06/20	4,133	95	66	141	20	4,455	3,563	62	55	129	14	3,823	8,278
SPR-EB	06/20	80	1	2	2	0	85	89	2	5	1	1	98	183
SPR-WB	06/20	118	1	0	1	0	120	111	0	1	3	0	115	235
<b>Total</b>		<b>15,258</b>	<b>15,258</b>	<b>647</b>	<b>272</b>	<b>500</b>	<b>61</b>	<b>16,738</b>	<b>12,870</b>	<b>495</b>	<b>277</b>	<b>458</b>	<b>47</b>	<b>14,147</b>

Plaza		AVI Revenue					Total	PBM Revenue					Total	Total Rev
Plaza	Date	2	3	4	5	6	Total	2	3	4	5	6	Total	Total Rev
183 Entry	06/20	\$1,219.90	\$117.70	\$79.20	\$156.20	\$5.50	\$1,578.50	\$1,358.50	\$117.00	\$78.40	\$174.87	\$13.04	\$1,741.81	\$3,320.31
183 Exit	06/20	\$441.10	\$57.20	\$34.65	\$94.60	\$13.75	\$641.30	\$407.55	\$72.80	\$50.96	\$112.23	\$29.34	\$672.88	\$1,314.18
GLR-EB	06/20	\$116.05	\$93.50	\$54.45	\$72.60	\$24.75	\$361.35	\$104.00	\$91.00	\$76.44	\$86.13	\$16.30	\$373.87	\$735.22
GLR-WB	06/20	\$319.55	\$156.20	\$3.30	\$112.20	\$0.00	\$591.25	\$228.15	\$139.10	\$19.60	\$70.47	\$0.00	\$457.32	\$1,048.57
GM	06/20	\$7,687.90	\$266.20	\$310.20	\$519.20	\$126.50	\$8,910.00	\$7,456.80	\$172.26	\$351.90	\$588.73	\$91.28	\$8,660.97	\$17,570.97
HBP-EB	06/20	\$31.35	\$30.80	\$4.95	\$44.00	\$2.75	\$113.85	\$29.90	\$32.50	\$7.84	\$65.25	\$0.00	\$135.49	\$249.34
HBP-WB	06/20	\$37.95	\$16.50	\$4.95	\$44.00	\$2.75	\$106.15	\$63.05	\$22.10	\$13.72	\$44.37	\$0.00	\$143.24	\$249.39
PM	06/20	\$2,273.15	\$104.50	\$108.90	\$310.20	\$55.00	\$2,851.75	\$2,315.95	\$80.60	\$107.80	\$336.69	\$45.64	\$2,886.68	\$5,738.43
SPR-EB	06/20	\$44.00	\$1.10	\$3.30	\$4.40	\$0.00	\$52.80	\$57.85	\$2.60	\$9.80	\$2.61	\$3.26	\$76.12	\$128.92

Trip Definition Report x

### Trip Definition Report ▾

Turnpike: All ▾

PDF Excel Preview Report

Trip	Trip Toll Zones	Active Date
TripCode 1 - LP1X NB: CVZ to 183	ENE	12/11/2014 13.16.45
TripCode 2 - LP1X NB: CVZ to Parmar	ENE,FWE	12/11/2014 13.16.45
TripCode 3 - LP1X NB: 2222 to Parmar	FWE	12/11/2014 13.16.45
TripCode 4 - LP1X SB: Parmar to 2222	PSB	12/11/2014 13.16.45
TripCode 5 - LP1X SB: Parmar to 5th/CVZ	PSB,RMS	12/11/2014 13.16.45
TripCode 6 - LP1X SB: 2222 to 5th/CVZ	RMS	12/11/2014 13.16.45

Trip Summary by Trip Definition Report

### Trip Summary by Trip Definition Report

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All

PDF Excel Preview Report

Display 50 records per page Search:

Trip Date	Trip Name	Hour	Count	Percentage
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	1	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	2	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	3	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	4	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	5	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	6	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	7	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	8	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	9	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	10	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	11	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	12	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	13	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	14	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	15	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	16	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	17	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	18	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	19	0	0%
06/20/2016 - 0 Trips	LP1X NB: CVZ to 183 - 0 Trips (0%) Rank - 1	20	0	0%

Showing 1 to 50 of 288 records

Previous 1 2 3 4 5 6 Next

Trip Summary by Trip Definition Report loaded.

Trip Transaction Detail Report

### Trip Transaction Detail Report

Start Date: 06/13/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: MoPac Entry Plaza: All Exit Plaza: All Agency: All Tag ID:

Plate State: Plate Number:

PDF Excel Preview Report

Display 50 records per page

Search:

**Trip Info**

9455114, 06/15/2016 12.52.10 - 06/15/2016 12.52.10, TRIP: LP1X NB: 2222 to Parmer, \$ .88, AVI

Plaza, TrxID	Trans Time	AM	Prime	Agency-Tag	Status	Review Type	Handshakes	Plate Info	Image	FareID
FWE, 500327833	06/15/2016 12.52.10.685	null	Y	TxDOT-2302144	G	O	27,0,0	CTG6490-TX	2	119805
9455115, 06/15/2016 22.46.48 - 06/15/2016 22.46.48, TRIP: LP1X NB: 2222 to Parmer, \$ 1.48, AVI										
9455116, 06/16/2016 13.20.25 - 06/16/2016 13.20.25, TRIP: LP1X NB: 2222 to Parmer, \$ 1.01, AVI										
9455117, 06/16/2016 09.08.18 - 06/16/2016 09.08.18, TRIP: LP1X NB: 2222 to Parmer, \$ .8, AVI										
9455118, 06/16/2016 17.51.54 - 06/16/2016 17.51.54, TRIP: LP1X NB: 2222 to Parmer, \$ 1.24, AVI										
9455119, 06/17/2016 01.21.49 - 06/17/2016 01.21.49, TRIP: LP1X NB: 2222 to Parmer, \$ .36, AVI										
9455120, 06/17/2016 01.10.01 - 06/17/2016 01.10.01, TRIP: LP1X NB: 2222 to Parmer, \$ .47, PBM										
9455121, 06/17/2016 14.03.55 - 06/17/2016 14.03.55, TRIP: LP1X NB: 2222 to Parmer, \$ 1.05, AVI										
9455122, 06/17/2016 22.20.52 - 06/17/2016 22.20.52, TRIP: LP1X NB: 2222 to Parmer, \$ 1.46, AVI										
9455123, 06/17/2016 23.04.44 - 06/17/2016 23.04.44, TRIP: LP1X NB: 2222 to Parmer, \$ 2, PBM										
9455124, 06/19/2016 14.34.56 - 06/19/2016 14.34.56, TRIP: LP1X NB: 2222 to Parmer, \$ .57, PBM										
9455125, 06/19/2016 14.39.49 - 06/19/2016 14.39.49, TRIP: LP1X NB: 2222 to Parmer, \$ .57, PBM										
9455126, 06/19/2016 14.48.38 - 06/19/2016 14.48.38, TRIP: LP1X NB: 2222 to Parmer, \$ .43, AVI										
9455127, 06/19/2016 14.49.21 - 06/19/2016 14.49.21, TRIP: LP1X NB: 2222 to Parmer, \$ .57, PBM										
9455128, 06/19/2016 14.49.38 - 06/19/2016 14.49.38, TRIP: LP1X NB: 2222 to Parmer, \$ .57, PBM										
9455129, 06/19/2016 14.50.11 - 06/19/2016 14.50.11, TRIP: LP1X NB: 2222 to Parmer, \$ .43, AVI										

Showing 1 to 38 of 38 records

User Activity

User Activity

Start Date: 06/12/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Users: All

PDF Excel Preview Report

Display 50 records per page Search:

Date Time	User Name	User ID	Operation	Description
06/17/16 12:44:31	GMACK	2185	ELCC	SIGN_OVERRIDE
06/13/16 14:16:06	GMACK	2185	ELCC	SIGN_OVERRIDE
06/15/16 08:46:00	GMACK	2185	ELCC	SIGN_OVERRIDE
06/16/16 12:36:05	GMACK	2185	ELCC	SIGN_OVERRIDE
06/14/16 14:37:20	GMACK	2185	ELCC	SIGN_OVERRIDE
06/14/16 14:26:43	GMACK	2185	ELCC	SIGN_OVERRIDE
06/14/16 14:54:03	GMACK	2185	ELCC	SIGN_OVERRIDE
06/15/16 12:04:07	GMACK	2185	ELCC	SIGN_OVERRIDE
06/16/16 11:06:41	GMACK	2185	ELCC	SIGN_OVERRIDE
06/17/16 16:22:25	GMACK	2185	ELCC	SIGN_OVERRIDE
06/17/16 17:02:57	GMACK	2185	ELCC	SIGN_OVERRIDE
06/20/16 10:20:19	GMACK	2185	ELCC	SIGN_OVERRIDE
06/13/16 09:09:18	GMACK	2185	ELCC	SIGN_OVERRIDE
06/20/16 10:18:59	GMACK	2185	ELCC	SIGN_OVERRIDE
06/13/16 09:12:16	GMACK	2185	ELCC	SIGN_OVERRIDE
06/14/16 14:24:21	GMACK	2185	ELCC	SIGN_OVERRIDE
06/14/16 14:38:05	GMACK	2185	ELCC	SIGN_OVERRIDE
06/14/16 14:42:20	GMACK	2185	ELCC	SIGN_OVERRIDE
06/13/16 10:38:05	GMACK	2185	ELCC	SIGN_OVERRIDE
06/15/16 12:14:38	GMACK	2185	ELCC	SIGN_OVERRIDE

Showing 1 to 28 of 28 records

Previous 1 Next

User Activity loaded.

User Management

### User Management

Active Users

Username	Active	Key
<input type="checkbox"/> ABURROLA	Y	-
<input type="checkbox"/> AHERRERA	Y	-
<input type="checkbox"/> AKEATING	Y	-
<input type="checkbox"/> ANGUYEN	Y	-
<input type="checkbox"/> ARINCONES	Y	-
<input type="checkbox"/> ARINCONES@CCRMA.ORG	Y	-
<input type="checkbox"/> ATAYLOR	Y	-
<input type="checkbox"/> BBLACK	Y	-
<input type="checkbox"/> BCALLURU	Y	1121
<input type="checkbox"/> BCLEVEN	Y	-
<input type="checkbox"/> BGUTTI	Y	-
<input type="checkbox"/> BHAGAWATULA1238	Y	1238
<input type="checkbox"/> BPINCUS3	Y	-
<input type="checkbox"/> BRODGER	Y	-
<input type="checkbox"/> CAGUILERA	Y	-
<input type="checkbox"/> CANDREWS	Y	-

#### User Information

User ID:

Prefix:

First:

Middle:

Last:

Suffix:

Email:

Gender:  Male  Female

Username:

Password:

Confirm:

Submit Clear Deactivate

#### Roles Assigned

No matching records found

#### Roles Available

No matching records found



Variable Fare Schedule Detail

### Variable Fare Schedule Detail

Start Date: 06/20/2016 Start Time: 00:00 End Date: 06/21/2016 End Time: 23:59

Turnpike: All

PDF Excel Preview Report

Display 50 records per page

Search:

Fare File ID	Fare Class	AVI	PBM
Farefileid: 124521, 06/20/16 00:25:00 - 06/20/16 00:29:05	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124569, 06/20/16 00:57:10 - 06/20/16 01:00:40	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124587, 06/20/16 01:08:50 - 06/20/16 01:12:55	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124617, 06/20/16 01:28:40 - 06/20/16 01:32:45	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124823, 06/20/16 01:32:45 - 06/20/16 01:36:50	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124647, 06/20/16 01:49:10 - 06/20/16 01:52:40	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124779, 06/20/16 03:16:50 - 06/20/16 03:20:55	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124791, 06/20/16 03:25:00 - 06/20/16 03:29:05	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124821, 06/20/16 03:44:50 - 06/20/16 03:48:55	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124887, 06/20/16 04:28:40 - 06/20/16 04:32:45	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124941, 06/20/16 05:04:55 - 06/20/16 05:09:00	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124959, 06/20/16 05:17:10 - 06/20/16 05:20:40	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 124971, 06/20/16 05:24:45 - 06/20/16 05:28:50	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 125001, 06/20/16 05:45:15 - 06/20/16 05:48:45	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 125013, 06/20/16 05:52:50 - 06/20/16 05:56:55	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 125043, 06/20/16 06:12:40 - 06/20/16 06:16:45	CLASS 2 VEHICLE	\$0.25	\$0.33
Farefileid: 125091, 06/20/16 06:44:50 - 06/20/16 06:49:53	CLASS 2 VEHICLE	\$0.40	\$0.53
Farefileid: 125103, 06/20/16 06:53:00 - 06/20/16 06:57:05	CLASS 2 VEHICLE	\$0.45	\$0.60
Farefileid: 125163, 06/20/16 07:32:45 - 06/20/16 07:36:50	CLASS 2 VEHICLE	\$0.50	\$0.67
Farefileid: 125193, 06/20/16 07:53:10 - 06/20/16 07:56:45	CLASS 2 VEHICLE	\$0.50	\$0.67

Showing 1 to 50 of 170 records

Previous 1 2 3 4 Next

Variable Fare Schedule Detail loaded.



Vehicle Usage

Vehicle Usage

Start Date:  End Date:  Program Name:  Tag ID:

Plate State:  Plate Number:

Display  records per page Search:

Tag-Plate-Program	Plaza	Lane	Date Time	TrxId	Post Date	Rate	Total
TEX.00067122-GNR6108-Carma	Lakeline Plaza NB	4	06/17/2016 16:16:07.623000	691262814	06/18/2016	\$0.54	-
TEX.00067122-GNR6108-Carma					TOTAL	-	\$0.54
TEX.00146782-BG1G121-Carma	Lakeline Plaza NB	4	06/17/2016 17:30:31.713000	691322854	06/18/2016	\$0.54	-
TEX.00146782-BG1G121-Carma	Park Street Mainline	6	06/18/2016 13:26:07.687000	691645035	06/19/2016	\$1.46	-
TEX.00146782-BG1G121-Carma	Park Street Mainline	7	06/17/2016 17:33:06.006693	691324996	06/18/2016	\$1.46	-
TEX.00146782-BG1G121-Carma	Park Street Mainline	11	06/18/2016 13:11:37.169000	691637273	06/19/2016	\$1.46	-
TEX.00146782-BG1G121-Carma					TOTAL	-	\$4.92
TEX.00164789-DKG2726-Carma	Brushy Creek NB	1	06/17/2016 18:30:25.114750	691368969	06/18/2016	\$0.58	-
TEX.00164789-DKG2726-Carma	Lakeline Plaza NB	2	06/17/2016 18:28:29.823000	691365071	06/18/2016	\$0.54	-
TEX.00164789-DKG2726-Carma					TOTAL	-	\$1.12
TEX.00326755-GF58JP-Carma	Brushy Creek SB	1	06/17/2016 10:19:23.938402	691065001	06/18/2016	\$0.58	-
TEX.00326755-GF58JP-Carma	Lakeline Plaza NB	2	06/17/2016 12:22:39.952911	691123621	06/18/2016	\$0.54	-
TEX.00326755-GF58JP-Carma	Lakeline Plaza SB	3	06/17/2016 10:21:13.205923	691065660	06/18/2016	\$0.54	-
TEX.00326755-GF58JP-Carma					TOTAL	-	\$1.66
TEX.00566957-DXD5565-Carma	Lakeline Plaza NB	2	06/18/2016 13:22:55.363000	691643485	06/19/2016	\$0.54	-
TEX.00566957-DXD5565-Carma	Park Street Mainline	7	06/18/2016 13:25:31.436000	691644707	06/19/2016	\$1.46	-
TEX.00566957-DXD5565-Carma					TOTAL	-	\$2.00
TEX.00673960-BM9T227-Carma	Crystal Mainline	3	06/18/2016 17:48:31.976000	691769005	06/19/2016	\$1.03	-

## Document Control

<b>Document Name:</b>	GGB RTCS Transition Plan
<b>File Name:</b>	GGB_Transition_Plan
<b>Project Reference #:</b>	
<b>Project Title:</b>	GGB RTCS
<b>Client:</b>	GGB
<b>Project Manager:</b>	Tony Marti
<b>Author:</b>	Mike Yager

## Change Notice

Revision#	Change Reason	Reviewer	QA By	Date Completed
1.0	Initial draft submittal.	M. Agnolin	R. Erwin	10/19/2016
1.1	RFP Conformance	J. Kohli	T. Ghaffarian	12/4/2016

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## 1 Introduction

### 1.1 Purpose

Please note that this is a SAMPLE Transition Plan. The information will change to reflect the requirements of the GGB System appropriately. The Implementation Plan will be submitted within (XXX) days upon NTP.

The Transition plan will be utilized to coordinate all activities between GGB, Kapsch, and subcontractors. The objective of the plan will be to ensure that the transition from the legacy toll collection system to the new solution mitigates risk and impact to the existing customer base, daily operations, and eliminates the possibility of data loss. The Transition Plan will detail the coordination efforts of Kapsch, GGB, and subcontractors.

### 1.2 Transition Objectives

Kapsch recognizes a seamless transition from the NG System to the ETC 3G Toll System involves a complex process requiring close coordination between many stakeholders. The key objectives of our transition process are fourfold:

- Addressing the need to minimize or completely avoid any loss of revenue due to the transition process; and
- Ensuring that the reliability, accuracy and functionality of the existing NG System and the new ETC 3G Toll System are not compromised
- Ensuring the safety of all involved parties including, but not limited to patrons, contractors, Kapsch personnel, and GGB personnel
- Ensuring that customers are not inconvenienced by the transition process

### 1.3 Transition Overview

The **Implementation Plan** will address, with minimal operational interference, each of the following areas in detail:

- Complete and detailed transition schedules
- Work hours and site conditions
- Civil Construction options
- Material delivery schedules
- Software deliverable milestones
- Installation plans
- Quality metrics
- Safety requirements
- Security policies
- Data retention
- Operational concerns
- Maintenance
- Troubleshooting
- Computer systems utilized
- Peak traffic hours
- Training
- Commissioning and acceptance testing
- Minimizing impact and invisible to customers (patrons)

## Schedules

The Transition Plan will be considered a subset of the Master Program Plan and will be consistent with the Management Plan's processes and procedures.

The following schedule considerations will be included:

- Limitations of work in high traffic locations
- Modifications to the Plazas, Customer Service Center (CSC) and Administration Buildings
- Installations of all system components to fulfill contracted requirements
- Transition Approach Step scheduling.

**All work will be in compliance with all applicable laws, codes, rules, and regulatory guidelines.**

## 1.4 Acronyms and Definitions

Exhibit 1.4-1 below provides a list of acronyms and their meanings. These acronyms appear at various places in the document:

**Exhibit 1.4-1: Acronyms and Definitions**

Acronym	Definition
CSC	Customer Service Center
FCC	Federal Communications Commission
HASP	Health and Safety Plan
ICD	Interface Control Document
IP	Internet Protocol
MOT	Maintenance of Traffic
PDU	Power Distribution Unit
PIO	Public Information Officer
POC	Point of Contact
QA	Quality Assurance
QM	Quality Manager
RFI	Released for Installation
RFP	Request For Proposal
ROM	Record Of Materials
RTC	Roadside Toll Cabinet
RTS	Roadway Toll System
SDD	System Design Document
TCS	Traffic Control Supervisor
UPS	Uninterrupted Power Supply
UTA	Universal Toll Antenna
VPN	Virtual Private Network

## 1.5 Work Standards Compliance and Safety Plan

Kapsch adheres to all installation standards, applicable laws, ordinances and codes as required, including but not limited to HASP and OSHA. All transition/installation activities shall meet such requirements, and Kapsch requires

and verifies that all our subcontractors are equally in compliance. In addition to training and adherence to the above, all installation personnel are required to review the HASP as well as the GGB Safety Procedures and Guidelines Manual.

All personnel will be adequately briefed on the Environmental Compliance Plan, HASP, Traffic Incident Management Plan (with an emphasis on emergency notification), Traffic Management Plan, and Maintenance of Traffic Plans before field work mobilization.

## **2 Communications, Coordination, and Reporting**

This section of the Transition Plan describes Kapsch's approach to achieving an active communications channel between all members of the team. A kickoff meeting will be performed to review the plan and responsibilities during the transition. This method describes:

- Responsibilities of the Transition Team
- Specific Kapsch responsibilities
- Specific GGB responsibilities
- Specific MDOT responsibilities
- Safety precautions to be enforced during transition
- Quality assurance procedures applied during transition

A Transition team will be utilized for the key communications between Kapsch and GGB personnel during the transition period. Transition team members, designated by both organizations, will continue to meet until the host and all tolling lanes are transitioned, will handle issues as they arise, and be responsible for system transition. Specific responsibilities for the transition team are:

- Scheduling on-site installation activities
- Scheduling on-site testing activities
- Scheduling on-site training activities
- Handling issues as they arise

Once transition/installation work begins, Kapsch will provide GGB with daily progress reports via email or verbal communication. These reports will be in the form of a short meeting or a written document. The agenda of the daily reports will provide information on:

- Addressing unresolved issues and action items
- Activities completed the previous day
- Activities planned but not completed the previous day
- Corrective action for work not completed
- Updates to the project schedule
- Updates to the Installation Schedule
- Personnel assigned to the project
- Pending change order requests
- Planned activities for the current and following weeks
- Safety Incidents or Concerns

In coordination with GGB personnel, a weekly construction meeting will be held with a broader set of Kapsch installation resources and other Contractors to coordinate completion of contract activities, report on work progress, forecast upcoming work, identify recovery plans for delayed work, identify installation issues and submit

a schedule update. Kapsch will develop the meeting agenda with the GGB construction field office at least 48 hours before the meeting.

**2.1.1 Coordination with Other Contractors and Suppliers**

Some the transition/installation activities could require additional coordination with other contractors and suppliers.

Kapsch will facilitate all necessary coordination to complete all work. Kapsch will work in close collaboration with GGB to establish and then monitor the data link between roadside enclosures and the host for problems or excessive traffic.

Kapsch will coordinate with GGB to create needed external connections for remote VPN links and communications with the ROMS exchange server for email notifications. Once communications is established, Kapsch will use the VPN remote connections to provide full staff support to the on-site transition/installation team.

Independent testing will be completed after the physical interconnections between the Host systems, and GGB assets are configured and finished. Interfaces will be tested in a coordinated fashion by sending sample data files, in conformance with the Interface Control Document (ICD), back and forth across the communication linkages, first by manually transmitting the files and then using the automated functions of the sending and receiving systems. This coordinated testing will be done as soon as the Host systems and communication connections are able to support it. At this time it is not anticipated that support from existing lane vendor will be required, except operational changes to the system when taking it offline to perform work.

**2.2 Communications with GGB during Installation/Transition**

Below is the list of contacts for changes, installation activities, or emergencies during the transition/installation of the GGB ETC 3G.

**Exhibit 2.2-1: GGB Point of Contact (POC) List**

Point of Contact	Number/Email
Environmental Manager	TBD*
GGB	TBD *
Project Engineer	TBD *
Operations & Maintenance Project Manager	TBD *
Contract Administrator	TBD *
Public Information	TBD *
Risk Management	TBD *

*\*All contact numbers and/or email addresses will be confirmed and updated at the Pre-Transition Meeting. This table will then be updated.*

**2.3 FCC Licenses**

At the transitions sites, the existing FCC licenses will be utilized.

For the ETC/Express Lanes sites, Kapsch will provide to GGB radio staff or support with all information needed to secure FCC licenses before installation. Information provided consists of the following: frequencies, and other related information. A copy of the license will be maintained by Kapsch.



## 2.4 System Support Resources

Kapsch will facilitate all necessary coordination to complete all work. Kapsch will collaborate closely with GGB to establish and then monitor the data link between GGB ETC 3G roadside enclosures and Central Host for problems or excessive traffic.

Kapsch will coordinate with GGB to create needed external connections for remote VPN links and communications with the ROMS exchange server for email notifications. Once communications are established, Kapsch will use the VPN remote connections to provide full staff support to the on-site transition/installation team.

## 3 Requirements Gathering

Before installation, Kapsch will gather requirements from the Authority, electrical and civil contractors. Kapsch will also have discussions with GGB Operations and IT staff to develop a Master Transition Schedule. The schedule will address the following items:

- Components: Approval of all subsystems and components including installation diagrams
- Equipment: Long lead items for delivery are scheduled.
- Schedule: Determine critical milestones in the civil effort and identify key lanes with the help of GGB. Determine work hours on a per lane basis. Set subsystem test plan milestones into installation schedule.
- Software: Set milestones for software deliverables that will reflect accurately when component installation can begin.
- Spares: Ensure that there are adequate spare in place before transitioning to the roll out support services
- Data retention: Establish best practices to ensure that all data is uploaded and verified from both the lane level, Server level and CSC when possible. Ensure proper shutdown procedures are followed for legacy components. Ensure that correct labeling and storage locations are verified for all legacy components.
- Parallel platforms: Ensure that network infrastructure will support multiple platforms during the transition phase. This will be especially critical on the Host portion.
- Safety: A safety officer will be appointed to ensure that all best possible safety practices are followed.
- Training: Kapsch will provide training material for installation and maintenance. These documents will be used by personnel to ensure no adverse impact to patrons and proper installation procedures are followed. Additionally, Kapsch will conduct transition Operations training for all GGB staff assigned to work on the ETC 3G Toll System. The training will include a variety of Operating scenarios including the need to run lanes within each facility or across separate facilities some of which are equipped with the existing lane Systems and some of which are equipped with the new lane Systems.
- Spares of appropriate types and quantities will be identified and located at each of the plazas.

## 4 Transition Planning and Development

- Pre-installation site surveys will occur during the design phase. The dimensions will be verified before the replacement of the legacy components.
- Conversion of lanes from the existing toll collection system to the new lanes will occur progressively. There will be an interim *black box* at each plaza to stand in between the legacy plaza host and the new lanes for conversion of all lane transactions into the ICD format of the existing toll host.
- The parallel new toll host system will be installed and tested but will not pass transactions to the CSC until Step 4 as detailed in the Transition Approach, RFP Section 2.4.1.2 – Table 16.
- ROMS will be operational starting at Step 1 of the Transition Approach.
- One plaza at a time will be removed from service unless otherwise approved by the GGB.
- It is expected that re-alignment and spacing of sensors occur during installation. This may be determined on a per lane basis. During the testing phase, these locations will be determined.

- Interruption of traffic flow or toll collections will be with the approval of the GGB.

## 5 Installation

### 5.1 Equipment Staging

Vehicles and equipment will stage at multiple project staging areas. The staging areas consist of warehouse space with existing exterior paved parking lot areas. Vehicles parked outside the warehouse space overnight may include box trucks or vans, and pick-up trucks. Materials stored within the warehouse will include:

- Vehicles and necessary equipment
- Tolling Hardware/Equipment

### 5.2 Verification of Pre-Existing Equipment

GGB will verify the following pieces of pre-existing equipment:

- Fiber optic patch panels and existing network
- Rate sign and rate sign controllers and all associated equipment for communication
- Readers, antennas, and associated cables
- Electrical supply system
- UPS
- Loops, loop lead in cables, and loop controller
- Enforcement Beacons
- Environmental systems of the roadside toll cabinet (example AC units)

Kapsch will verify the equipment being installed by Kapsch.

### 5.3 Equipment Installation Activities

Kapsch will install the following toll equipment in the roadside cabinets as depicted in the installation drawings:

- Lane Controllers
- Component Panel
- SNAP Components
- Power Supply
- Loop Rack
- Network Switch
- LPIC (VES Cameras)

GGB will remove equipment that is not to be reused by Kapsch before Kapsch commencing installation activities.

## 6 Testing Overview

The following test efforts will have a formal test plan or checklist prepared in advance of testing to evaluate expected versus actual results for structured inputs. For RFP required tests, plans will be submitted in advance for approval, tests may be witnessed or monitored by Commission, and results will be presented for approval. For

non-required tests, plans and results may be submitted for informal review, and the Commission is invited to observe at their discretion.

Example/Sample Testing sequence:

1. Hardware test for checklist of functions for normal and abnormal sequence of button activations, check all functions
2. Preliminary testing of new software modules
3. Factory test plan for lane mock-up using simulated vehicle transaction and sensor data- error logging
4. Field testing of temporary full-service lane in bypass lane of all communications and function verification, then preliminary subset of SAT using live vehicles
5. System Acceptance Testing:
  - Controlled test using subject vehicles in structured steps for multiple scenarios of normal and abnormal transactions.
  - Record observed results to compare with expected results, compare screens, system response (such as required pages), and reports results with observed results.
  - Record video of live vehicles in the lanes under actual operating conditions with toll collector (or manual) using DVAS cameras, and create a list of expected results based on our review of the video.
  - Compare expected results to actual results by examining screens, reports, logs, and other relevant information. Perform test for xxx vehicles in one lane using a toll collector, and one lane for xxx E-ZPass transactions in a dedicated lane.
  - Perform for xxx transactions in all other lanes.
  - Use a total of all transactions to calculate the accuracy of the system.
  - Monitor all lane operations; calculate downtime and availability using maintenance reports, logs, and other relevant metrics.

## 7 Transition Risks and Mitigation

The table below lists the key anticipated risks and associated mitigation strategies.

**Exhibit 7-1: Transition Risks and Mitigation**

<b>Anticipated Transition Risk</b>	<b>Mitigation Strategies</b>
Compressed Project Schedule	Early access to the initial work site location  Kapsch will work closely with GGB to arrange for early access to the initial work site. If this is not feasible Kapsch will make our test site available to the project team to stage equipment and practice for the transition
Construction work site access conflicts	Kapsch will coordinate schedules and access to the work sites with all stakeholders and conduct weekly planning activity during the installation and commissioning phases as outlined in the prior section.
AC Power and Network bandwidth availability and AVI reader RF interference	Kapsch will resolve these items by sharing power and network bandwidth budget projections with the GGB during early stage of the project and supplement with back-up generators and 4G/LTE wireless connections as

Anticipated Transition Risk	Mitigation Strategies
	<p>deemed appropriate.</p> <p>As the designer and manufacturer of the Badger and JANUS® readers, Kapsch is uniquely positioned to develop interference mitigation schemes for existing readers operational at existing plazas. Kapsch will deploy transition software/firmware builds if necessary to ensure that all AVI equipment operates in a synchronous and interference free manner.</p>
<p>Undocumented behavior of ETC NG System interfaces adversely affecting “black box” conversion of transactions generated by the ETC 3G Toll System</p>	<p>Kapsch will request early access to ETC NG System equipment and all pertinent documentation and characterize the behavior of the system under both normal and atypical conditions. The “black box” converter development will be based on these findings. Kapsch will conduct extensive pre-integration testing in a test environment to fully validate the conversion prior to in-field deployment and integration.</p>
<p>Incompatible reconciliation reports</p>	<p>Kapsch will seek early input from GGB on the reconciliation reports in terms of available data and reporting formats to allow for seamless reconciliation</p>

Additional risk areas are discussed in the sections that follow below.

### 7.1 Equipment Installation

To mitigate the risk of installation duration Kapsch identify and implement any lessons learned from the early site installation to ensure the remaining installations will be smooth. Installation work at the remaining sites will be performed by multiple crews working around the clock. The removal of the existing equipment will be performed ahead of the installation work and will require close coordination between the installation team and removal team.

Pre-work will be performed to configure and install software at the Kapsch staging area, prior to delivering the equipment to the field. This will minimize the amount of time required by the software team to implement the equipment and software in the field. There will be tuning and minor adjustments required in the field however this should be limited as a result of the pre-work.

### 7.2 Software Development/Integration

Software integration will require testing and development. There are inherent risks with any software development namely resources, testing, and time.

To mitigate the risks associated with the development and integration of the software solution Kapsch has developed a Software Development Plan which identifies the potential risks and mitigation strategies for these risks. For a full list of risks associated with the software development/ integration see the SDP.

## 8 Maintenance

Maintenance services will be provided for the duration before acceptance of a Subsystem and during the warranty period

- Services include personnel, tools and test equipment, facilities, transportation and spare parts
- Services shall be conducted in accordance with the Preventive and Corrective Maintenance Manuals, utilizing the capabilities of the Remote Operations and Maintenance System (ROMS)
- Services will be performed in compliance with the Mean Time to Repair metric required by the applicable Technical Specifications and specified within the contract
- A Preventive Maintenance Manual will be generated, and include a list and description of preventive and predictive maintenance tasks, and timetables
- Address and resolve software problems and software/hardware problems during the warranty period

## 9 Successor Transition

Kapsch acknowledges our responsibility for supporting the transition to the successor system at the end of the Toll System Contract. To that end Kapsch will:

- Furnish transition services for up to 365 Days after the Toll System Contract expires;
- Negotiate in good faith an agreement and plan with a successor to determine the nature and extent of transition services required;
- Participate in a training program and schedule the hand-over of responsibilities to the successor in close coordination with GGB; and
- Provide sufficient experienced personnel during the transition period to ensure that the services called for by this Contract are maintained at the required level of proficiency.

## Appendix B: GGB Sample Component List

Component	Manufacturer	Location	Part	Model	Version	Serial
AVI Reader	Kapsch	BHT I-895 SB Lane 9	802260-TAB	MPR	v2.3	5240101

Note: GGB Team to populate with existing equipment meant to be used in production after transition is complete.

**Appendix C: Transition/Installation Checklist**

**PROJECT: GGB**  
**LOCATION: TOLL ZONE \_\_\_\_\_**

**PRE-INSTALLATION CHECKLIST**

*This form to be completed by the Installation Manager and Installation Supervisor.*

**CONFIRM BEFORE GOING TO THE FIELD**

<u>ZC/ICS</u> <i>(ADEK 291-B)</i>	<u>INITIALS</u>	<u>DATE</u>	<u>UPS</u> <i>(APC)</i>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON RAILS			INSTALLED ON MOUNTS		
CONFIGURED CORRECTLY			CONFIGURED CORRECTLY		
ASSET TAGGED			ASSET TAGGED		

<u>SWITCH</u> <i>(CISCO)</i>	<u>INITIALS</u>	<u>DATE</u>	<u>PDU</u> <i>(TRIPPLITE)</i>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON MOUNTS			INSTALLED ON MOUNTS		
CONFIGURED CORRECTLY			CONFIGURED CORRECTLY		
ASSET TAGGED			ASSET TAGGED		

<u>LOOP DETECTOR</u> <i>(NORTHSTAR)</i>	<u>INITIALS</u>	<u>DATE</u>	<u>READERS</u> <i>(IDENTITY 5204)</i>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON MOUNT			READERS ASSET TAGGED		
ASSET TAGGED					

<u>ANTENNAS</u> <i>(AA3152 UTA)</i>	<u>INITIALS</u>	<u>DATE</u>
ANTENNAS ASSET TAGGED		

COMMENTS:

**APPROVALS**

INSTALLATION MANAGER: \_\_\_\_\_ DATE: \_\_\_\_\_

INSTALLATION SUPERVISOR: \_\_\_\_\_ DATE: \_\_\_\_\_

**PROJECT: GGB**  
**LOCATION: TOLL ZONE \_\_\_\_\_**  
**PRE-INSTALLATION CHECKLIST**

*This form to be completed by the Installation Manager and Installation Supervisor.*

**CONFIRM IN THE FIELD**

<u>ZC/ICS</u>		
<u>(ADEK 291-B)</u>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON RAILS		
CONFIGURED CORRECTLY		
ASSET TAGGED		

<u>SWITCH</u>		
<u>(CISCO)</u>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON MOUNTS		
CONFIGURED CORRECTLY		
ASSET TAGGED		

<u>LOOP DETECTOR</u>		
<u>(NORTHSTAR)</u>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON MOUNT		
ASSET TAGGED		

<u>PDU</u>		
<u>(TRIPPLITE)</u>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON MOUNTS		
CONFIGURED CORRECTLY		
ASSET TAGGED		

<u>UPS</u>		
<u>(APC)</u>	<u>INITIALS</u>	<u>DATE</u>
INSTALLED ON MOUNTS		
CONFIGURED CORRECTLY		
ASSET TAGGED		

<u>READERS</u>		
<u>(JANUS MPR2)</u>	<u>INITIALS</u>	<u>DATE</u>
READERS ASSET TAGGED		

<u>ANTENNAS</u>		
<u>(AA3152 UTA)</u>	<u>INITIALS</u>	<u>DATE</u>
ANTENNAS ASSET TAGGED		

<u>Camera</u>		
<u>(Kapsch VRX)</u>	<u>INITIALS</u>	<u>DATE</u>
ANTENNAS ASSET TAGGED		



## **Appendix D: Allowable Closure Times**

Section will be populated once information is received from Maryland Department of Transportation Standards.

**Proposer is to complete the following columns on the RTM worksheet:**

The RTM shall be completed by the Proposer for all requirements. The spreadsheet columns on the 'Requirements' tab are defined and shall be completed as follows:

<b>Column</b>	<b>Description</b>
Level	Corresponds to the Table of Contents level of the section/requirement
Requirement Number	Corresponds to the Requirement Number(s) for requirements listed
Requirement	The text of the requirement
Type	The requirement type
Proposer Acknowledges Requirement	For Proposal and Informational Requirements enter "Accepted" if Proposer accepts requirement and can meet it. Enter "Not Accepted" if Proposer does not accept requirement. If not accepted, Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not accept requirement must be entered in the Comments field. NOTE that a response of "Accepted" for Proposal requirements means requirement is addressed in Proposal.
Will be met in execution of SOW?	For Maintenance, Procedural and Performance Requirements enter "Yes" if the requirement will be met during the execution of the Scope of Work (SOW), enter "No" if the Proposer can not meet requirement. If "No" is selected, Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not meet requirement must be entered in the Comments field.
Fully Supported by Existing System ?	Enter "Yes" if the Proposed system for this project fully supports the requirement. Otherwise, enter "No". If "No" (or N/A) is selected the Proposer will be prompted with a pink cell in the Comments column. An explanation of why Proposer can not meet requirement or why requirement is N/A, must be entered in the Comments field.
Comments	In the Comments column, enter a brief comment/ explanation addressing how the gap will be filled, or why the requirement will not be fully met.
Proposal Reference	Provide the reference(s) to the section(s) where the Proposal addresses the comment(s).

**Any requirement as set forth in the RFP that is not listed here is still required to be completed.**

Golden Gate Bridge RTCS  
Requirements Traceability Matrix

	Version 1		Informational & Proposal Requirements	Maintenance, Procedural and Performance Requirements	Functional Requirements Only		
Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
<b>2</b>	<b>PROJECT FRAMEWORK</b>						
<b>2.1</b>	<b>PROJECT MANAGEMENT</b>						
<b>2.1.1</b>	<b>Project Manager</b>						
2.1.1.1	The TSI shall provide a Project Manager approved by the District.	Procedural		Yes			B.2 Staff Qualifications
2.1.1.2	The TSI shall dedicate the Project Manager full-time to the Project.	Procedural		Yes			B.2 Staff Qualifications
2.1.1.3	The Project Manager shall have the authority to make decisions for the TSI and assign the necessary staff to fulfill Project requirements.	Procedural		Yes			B.2 Staff Qualifications
2.1.1.4	The Proposer shall include a job description, Bio, and resume for the proposed Project Manager.	Proposal	Accepted				B.2 Staff Qualifications
<b>2.1.2</b>	<b>Gantry Coordinator</b>						
2.1.2.1	The TSI shall provide a Gantry Coordinator approved by the District.	Procedural		Yes			B.2 Staff Qualifications
2.1.2.2	The Gantry Coordinator shall have experience in open road tolling, Gantry equipment design, installation, safety, and AC power.	Procedural		Yes			B.2 Staff Qualifications
2.1.2.3	The Proposer shall include a job description, Bio, and resume for the proposed Gantry Coordinator.	Proposal	Accepted				B.2 Staff Qualifications
<b>2.1.3</b>	<b>RCSC Coordinator</b>						
2.1.3.1	The TSI shall provide a RCSC Coordinator approved by the District.	Procedural		Yes			B.2 Staff Qualifications
2.1.3.2	The RCSC Coordinator shall have experience in all electronic tolling, back office toll account processing, file exchange, and file processing.	Procedural		Yes			B.2 Staff Qualifications
2.1.3.3	The RCSC Coordinator shall become intimately familiar with the RCSC ICD and the interface requirements.	Procedural		Yes			B.2 Staff Qualifications
2.1.3.4	The Proposer shall include a job description, Bio, and resume for the proposed RCSC Coordinator.	Proposal	Accepted				B.2 Staff Qualifications
<b>2.1.4</b>	<b>Maintenance Manager</b>						
2.1.4.1	The TSI shall provide a Maintenance Manager approved by the District.	Procedural		Yes			B.2 Staff Qualifications
2.1.4.2	The Maintenance Manager shall have a minimum of 5 years' experience in the maintenance of toll systems.	Procedural		Yes			B.2 Staff Qualifications
2.1.4.3	The Maintenance Manager shall be the primary point of contact to the District during the entire Maintenance Phase.	Procedural		Yes			B.2 Staff Qualifications
2.1.4.4	The Maintenance Manager shall work directly with the implementation team to ensure an understanding of System design concepts.	Procedural		Yes			B.2 Staff Qualifications
2.1.4.5	The Proposer shall include a job description, Bio, and resume for the proposed Maintenance Manager.	Proposal	Accepted				B.2 Staff Qualifications
<b>2.1.5</b>	<b>Project Meetings</b>						
2.1.5.1	The TSI shall attend a Project kick-off meeting at the District's offices within one week of receiving a notice to proceed. All TSI lead staff and representatives from TSI sub-contractors shall attend the Project kick-off meeting.	Procedural		Yes			C.1.1 Project Management
2.1.5.2	The TSI shall schedule Project Status meetings no less frequently than monthly during Phases 1, 2 and 3.	Procedural		Yes			C.1.1 Project Management

Golden Gate Bridge RTCS  
Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.1.5.3	The TSI shall schedule Project Status meetings no less frequently than twice per month during Phases 4, 5 and 6.	Procedural		Yes			C.1.1 Project Management
2.1.5.4	The TSI shall plan on every other Project Status meeting being in-person at the District's offices.	Procedural		Yes			C.1.1 Project Management
2.1.5.5	The TSI shall publish an agenda for the Project Status meeting at least two (2) business days prior to the scheduled Project Status meeting.	Procedural		Yes			C.1.1 Project Management
2.1.5.6	The TSI shall publish a two-week look ahead to be included with the agenda for the Project Status meeting.	Procedural		Yes			C.1.1 Project Management
2.1.5.7	The TSI shall publish the latest action item list to be included with the agenda for the Project Status meeting.	Procedural		Yes			C.1.1 Project Management
2.1.5.8	The TSI shall capture minutes from all Project Status meetings and shall publish them within three (3) business days after the Project Status meeting.	Procedural		Yes			C.1.1 Project Management
2.1.5.9	The TSI shall maintain an action item list from the Project Status meetings and shall publish it with the minutes from the Project Status meeting.	Procedural		Yes			C.1.1 Project Management
2.1.5.10	The TSI shall attend any project related meetings scheduled by the District to which it is invited.	Procedural		Yes			C.1.1 Project Management
<b>2.1.6</b>	<b>Project Schedule Management</b>						
2.1.6.1	The Proposer shall submit a preliminary Project Schedule that provides for a fully functional System meeting all requirements in this Scope of Work. The Proposer's schedule shall be submitted with the proposal as instructed.	Proposal	Accepted				C.1.1 Project Management
2.1.6.2	The TSI shall submit a detailed Project Schedule within 30 days after notice to proceed. The Project Schedule shall identify all tasks to be accomplished, task dependencies, and start date and duration for each task.	Procedural		Yes			C.1.1 Project Management
2.1.6.3	The Project Schedule shall include deliverable dates for all documents that will be submitted for District review and approval.	Procedural		Yes			C.1.1 Project Management
2.1.6.4	The Project Schedule shall provide the District with a 14 day review period for each TSI deliverable.	Procedural					
2.1.6.5	The Project Schedule shall show review and approval task start dates and duration.	Procedural		Yes			C.1.1 Project Management
2.1.6.6	The Project Schedule shall include all detailed steps that are required to accomplish the major Project Phases.	Procedural		Yes			C.1.1 Project Management
2.1.6.7	The TSI shall include time for submittal, review and approval of all Project deliverables in the Project Schedule.	Procedural		Yes			C.1.1 Project Management
2.1.6.8	Throughout the Term of the Project, the TSI shall monitor, and update the Project Schedule whenever changes to the System of a material nature occur, or as directed by the District.	Procedural		Yes			C.1.1 Project Management
2.1.6.9	The required Project Schedule submittals shall be in Microsoft Project.	Procedural		Yes			C.1.1 Project Management
2.1.6.10	The TSI shall identify and promptly report to the District all Project Schedule and progress delays during the execution of the Project.	Procedural		Yes			C.1.1 Project Management
2.1.6.11	In the event of any Project Schedule delay, the TSI shall take appropriate action to develop a recovery schedule.	Procedural		Yes			C.1.1 Project Management
2.1.6.12	The TSI shall submit a recovery schedule within five (5) business days following the identification of a Project Schedule delay.	Procedural		Yes			C.1.1 Project Management
2.1.6.13	Recovery schedules shall not release the TSI from liability for a delayed schedule.	Procedural		Yes			C.1.1 Project Management

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.1.6.14	The TSI shall submit proposed changes to the Project Schedule together with the reason for the proposed changes for District approval as it becomes necessary to modify the Project Schedule.	Procedural		Yes			C.1.1 Project Management
2.1.6.15	Until the District approves in writing any Project Schedule revision, all Project Schedule submittals shall be tracked against the previously approved Current Project Schedule.	Procedural		Yes			C.1.1 Project Management
2.1.6.16	If the District approves the revised Project Schedule, it shall become the Project Schedule of record, referred to as the Current Project Schedule in the Contract. Approved schedule changes do not release the TSI from the original requirements and Contract Deadlines unless explicitly agreed to in writing by the District.	Procedural		Yes			C.1.1 Project Management
2.1.6.17	The TSI shall create a revised Project Schedule, based on approval of a proposed Project Schedule change, and it shall be used as the basis for the subsequent monthly Project Schedule updates and reports.	Procedural		Yes			C.1.1 Project Management
<b>2.1.7</b>	<b>Quality Control Requirements</b>						
2.1.7.1	The Proposer shall submit a description of how it will assure quality during all Phases of the Project. The description shall include a definition of its quality organization and processes used.	Proposal	Accepted				C.1.1.1 Quality Control Requirements
2.1.7.2	The TSI, in the Proposal, shall submit a Quality Management Plan (QMP) that describes Quality Assurance (QA) and Quality Control (QC) procedures for preparing, verifying and checking all products and performance criteria related to this Project to ensure that they are independently checked and back-checked in accordance with generally accepted practices for these types of services and the requirements of this Scope of Work.	Proposal					
2.1.7.3	The QMP shall describe specific QC and QA procedures, including sample forms and checklists.	Proposal	Accepted			Per Addendum 2 item A5, this is to go in Attachment 3 of the proposal and has no page limit.	C.1.1.1 Quality Control Requirements
<b>2.1.8</b>	<b>Deliverables</b>						
2.1.8.1	The TSI shall submit all deliverables per Appendix B and Section 10	Procedural		Yes			C.1.1.1 Quality Control Requirements
<b>2.1.9</b>	<b>Requirement Traceability Matrix (RTM)</b>						
2.1.9.1	The Proposer shall complete the RTM found in Appendix A in accordance with the attached instructions.	Procedural		Yes			H Requirement Traceability Matrix (RTM)
2.1.9.2	In completing the RTM, the Proposer shall take the opportunity to indicate any differences to the requirements or advantages to alternate solutions.	Procedural		Yes			H Requirement Traceability Matrix (RTM)
2.1.9.3	The RTM submitted with the Proposal will not be included in the scoring of Proposals. However, the TSI may be asked to clarify certain items during the interviews, if selected.	Informational	Accepted				H Requirement Traceability Matrix (RTM)
<b>2.2</b>	<b>PROJECT PHASES</b>						
<b>2.2.1</b>	<b>Phase 1 - Business Rules and System Requirements Definition</b>						

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.2.1.1	The TSI shall facilitate Business Rules and System requirements refinement workshops to review, discuss, refine and finalize the Business Rules and System requirements. These workshops shall include discussion of all functional areas and critical areas.	Procedural					
2.2.1.2	During these workshops, the TSI shall convey a full understanding of the intent of the System functions and Business Rules.	Procedural		Yes			C.1.2 Project Phases
2.2.1.3	During these workshops, the TSI shall discuss how the System shall meet the requirements.	Procedural		Yes			C.1.2 Project Phases
2.2.1.4	The TSI shall obtain written District approvals for any proposed changes resulting from the requirements definition workshops.	Procedural		Yes			C.1.2 Project Phases
2.2.1.5	The TSI shall submit a revised RTM including the results of the workshop to the District for review and approval after the requirements workshops.	Procedural		Yes			C.1.2 Project Phases
2.2.1.6	The TSI shall develop and deliver a Gantry Requirement Plan (GRP) over the period of the Phase 1 workshops.	Procedural		Yes			C.1.2 Project Phases
2.2.1.7	The RTM shall be maintained and updated by the TSI through System Acceptance.	Procedural		Yes			C.1.2 Project Phases
2.2.1.8	The RTM shall be updated at each Project Phase to identify each requirement, where it is addressed in the SDD, and which test procedure(s) are used to verify the requirement.	Procedural		Yes			C.1.2 Project Phases
2.2.1.9	RTM updates that trace requirements to the SDD shall be submitted with each SDD submittal.	Procedural		Yes			C.1.2 Project Phases
2.2.1.10	The TSI shall complete, and the District shall approve, the GRP and the initial version of the RTM as a condition of completing the Business Rules and System Requirements Definition Phase and progressing to the System Design Phase.	Informational	Accepted				C.1.2 Project Phases
<b>2.2.2</b>	<b>Phase 2 - System Design</b>						
2.2.2.1	The TSI shall appoint an RCSC Coordinator to manage the CSC integration process and testing and serve as a single point of contact to the interested stakeholders (i.e., BATA, the RCSC vendor, and the District).	Procedural		Yes			C.1.2 Project Phases
2.2.2.2	The TSI shall, in coordination with the stakeholders, shall ensure that the System design will support all aspects of the current RCSC ICD.	Procedural		Yes			C.1.2 Project Phases
2.2.2.3	The TSI shall conduct the RCSC ICD discussions in parallel with the Lane and Host design activities.	Procedural		Yes			C.1.2 Project Phases
2.2.2.5	District approval of the SDD including detailed Gantry equipment and conduit locations and an RCSC ICD checklist shall be required to complete the Design Phase.	Informational	Accepted				C.1.2 Project Phases
<b>2.2.3</b>	<b>Phase 3 - System Development</b>						
2.2.3.1	The TSI shall establish a location where developed hardware and software can be demonstrated, tested and verified.	Procedural					
2.2.3.2	The TSI shall schedule and conduct informal functional demonstrations throughout the System Development Phase to provide the District insight into the development progress and an opportunity to provide feedback during development.	Procedural					

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.2.3.3	The TSI shall set-up, conduct, and document the results of demonstrations including, but not limited to: <ul style="list-style-type: none"> <li>• Alert monitoring screens</li> <li>• System monitoring screens</li> <li>• Reporting Screens</li> <li>• RCSC Interface</li> <li>• Transaction files (Lane and Host) including reconciliation</li> <li>• Transaction research</li> <li>• Reference tables (toll amount, users, carpool hours, etc.)</li> <li>• Transaction flow from Lane to RCSC interface</li> <li>• ORT Lane operation including AVC and AVI correlation</li> </ul>	Procedural		Yes			C.1.2 Project Phases
2.2.3.4	The District may request additional functional demonstrations to be witnessed at TSI facilities at any time.	Procedural		Yes			C.1.2 Project Phases
2.2.3.5	The TSI shall be required to follow focused and methodical planning and execution as the RCSC is in operation with the public. It is essential that test data not co-mingle or interfere with live accounts. It is also essential that sufficient data and scenarios be tested prior to the go-live date.	Procedural		Yes			C.1.2 Project Phases
2.2.3.6	The TSI shall develop a FAT plan for approval by the District.	Procedural		Yes			C.1.2 Project Phases
2.2.3.7	The TSI shall implement the FAT as defined in Section 10.3.1 during this Phase	Procedural		Yes			C.1.2 Project Phases
2.2.3.8	The TSI shall develop a CSC Integration Test (CIT) plan for approval by the District.	Procedural		Yes			C.1.2 Project Phases
2.2.3.9	The TSI shall implement the CIT as defined in Section 10.3.2 during this Phase	Procedural		Yes			C.1.2 Project Phases
2.2.3.10	The completion of Phase 3 shall be the successful completion and approval of the FAT and CIT.	Informational	Accepted				C.1.2 Project Phases
<b>2.2.4</b>	<b>Phase 4 - Installation</b>						
2.2.4.1	The TSI shall prepare and submit a detailed Installation Plan 60 days prior to the start of installation as defined in Section 10.2.1.	Procedural		Yes			C.1.2 Project Phases
2.2.4.2	The TSI shall maintain a punch list during installation for review with the District Project Manager on a weekly basis.	Procedural		Yes			C.1.2 Project Phases
2.2.4.3	The District, Caltrans and/or their designee shall have access and time to inspect all aspects of installation.	Procedural		Yes			C.1.2 Project Phases
2.2.4.4	Installation activities shall not begin until all necessary plans, drawings, and documents are submitted and approved by the District.	Procedural		Yes			C.1.2 Project Phases
2.2.4.5	The TSI shall ensure that the System is installed pursuant to the approved SDD and Installation Plan.	Procedural		Yes			C.1.2 Project Phases
2.2.4.6	All installation and testing of communications equipment and wiring shall be done in a neat and professional manner by qualified network technicians.	Procedural		Yes			C.1.2 Project Phases
2.2.4.7	The TSI shall be responsible for conducting routine inspections of all installations and certifying in writing that the Gantry Contractor has completed installation per the approved design documentation and drawings.	Procedural					
2.2.4.8	As-built drawings shall be submitted within thirty (30) days of the completion of the installation.	Functional					
2.2.4.9	The completion of Phase 4 shall be the successful completion of the Gantry Equipment Field Test (GEFT).	Informational	Accepted				C.1.2 Project Phases
<b>2.2.5</b>	<b>Phase 5 - Transition</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.2.5.1	The TSI shall prepare and submit a detailed Transition Plan 30 days prior to the start of transition as described in Section 10.2.2.	Procedural		Yes			C.1.2 Project Phases
2.2.5.2	The TSI shall conduct training in the areas of operations, database system, and maintenance during the Transition Phase.	Procedural		Yes			C.1.2 Project Phases
2.2.5.3	Training shall be provided by professional, qualified trainers supported by appropriate technical experts.	Procedural		Yes			C.1.2 Project Phases
2.2.5.4	The TSI shall utilize the System User Manual for training on all interactive screens and functions used by the operators of the System.	Procedural		Yes			C.1.2 Project Phases
2.2.5.5	Training shall be conducted using the actual new System with live traffic data.	Procedural		Yes			C.1.2 Project Phases
2.2.5.6	The TSI training shall cover all System functions items including: <ul style="list-style-type: none"> <li>• Dashboard (if applicable)</li> <li>• Reports</li> <li>• Video Monitor</li> <li>• Transaction Monitor</li> <li>• Transaction Research</li> <li>• DVAS Operation</li> <li>• User Rights Management</li> <li>• Toll Schedule Management</li> <li>• Carpool Hours</li> <li>• Holiday Calendar</li> </ul>	Procedural		Yes			C.1.2 Project Phases
2.2.5.7	The TSI shall schedule three sessions for Operations training and determine with the District who should attend each session and the appropriate items to be covered.	Procedural		Yes			C.1.2 Project Phases
2.2.5.8	Training shall be conducted at District offices with web conferencing available.	Procedural		Yes			C.1.2 Project Phases
2.2.5.9	The TSI shall use the Host database documentation to train District designated individuals on the structure and meaning of all database tables and fields.	Procedural		Yes			C.1.2 Project Phases
2.2.5.10	The TSI shall conduct database training during the Transition Phase.	Procedural		Yes			C.1.2 Project Phases
2.2.5.11	The TSI shall indicate the minimum qualifications and database experience required to attend the class.	Procedural		Yes			C.1.2 Project Phases
2.2.5.12	The TSI shall conduct database training using an exact duplicate of the actual Host database populated with real data collected during the Transition Phase.	Procedural		Yes			C.1.2 Project Phases
2.2.5.13	The TSI shall conduct one database training course which is at a minimum of 24 hours of training delivered over one week and shall accommodate up to five people appointed by the District.	Procedural		Yes			C.1.2 Project Phases
2.2.5.14	The TSI shall conduct database training at District offices with web conferencing available.	Procedural		Yes			C.1.2 Project Phases
2.2.5.15	The TSI shall ensure that all class participants are able to generate queries, generate reports, as requested by the District and add/remove these reports from the System.	Procedural					
2.2.5.16	The TSI database trainer(s) shall be available through System acceptance to answer questions from the class attendees.	Procedural		Yes			C.1.2 Project Phases
2.2.5.17	The TSI shall use the Maintenance Manual and as-built drawings to instruct District personnel in the physical design of the System, Alerts, and monitoring and repair coordination.	Procedural		Yes			C.1.2 Project Phases



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.2.5.18	The TSI shall conduct two Maintenance training courses, which are a minimum of 24 hours each and delivered over one week and shall accommodate up to eight people appointed by the District in each course.	Procedural		Yes			C.1.2 Project Phases
2.2.5.19	The TSI maintenance training shall cover at a minimum: <ul style="list-style-type: none"> <li>• Changeable components</li> <li>• Electrical and communication requirements</li> <li>• Network</li> <li>• Alerts</li> <li>• Spares and support tools</li> <li>• Third-party agreements and licenses</li> <li>• TSI/GGB responsibilities and interaction</li> </ul>	Procedural		Yes			C.1.2 Project Phases
2.2.5.20	TSI subject matter experts (SME's) shall be available through the maintenance period to answer questions from the District.	Procedural		Yes			C.1.2 Project Phases
2.2.5.21	Training shall be conducted at District offices with web conferencing available.	Procedural		Yes			C.1.2 Project Phases
2.2.5.22	The TSI shall develop a schedule and plan to test the System production readiness as described in Section 10.3.4.	Procedural		Yes			C.1.2 Project Phases
2.2.5.23	The TSI shall pass the Production Readiness Test when all System functions have been tested and verified for correct operation with live traffic. Reasonable assurance that performance requirements will be met is also required as condition of passing the PRT.	Procedural		Yes			C.1.2 Project Phases
2.2.5.24	The TSI shall develop a Cutover Plan (see Section 10.2.5 to ensure a seamless transition from the current system to the System at one point in time.	Procedural		Yes			C.1.2 Project Phases
2.2.5.25	The TSI Cutover Plan shall ensure that the RCSC data exchange is in accordance with the accepted RCSC ICD.	Procedural		Yes			C.1.2 Project Phases
2.2.5.26	The completion of Phase 5 shall be the successful completion all training, verification of Lane level performance requirements, completion of testing requirements, and transition to live operations.	Informational	Accepted				C.1.2 Project Phases
<b>2.2.6</b>	<b>Phase 6 - System Acceptance</b>						
2.2.6.1	The TSI shall begin the System Acceptance Test concurrently with the maintenance period upon the transition to the System to live operations	Procedural		Yes			C.1.2 Project Phases
2.2.6.2	The TSI shall conduct the System Test Phase in accordance with the System Acceptance Test Plan as described in Section 10.3.5.	Procedural		Yes			C.1.2 Project Phases
2.2.6.3	The TSI shall complete the System Acceptance Phase by passing the System Acceptance Test.	Informational	Accepted				C.1.2 Project Phases
<b>2.3</b>	<b>DOCUMENTATION REQUIREMENTS</b>						
<b>2.3.1</b>	<b>General System Document Requirements</b>						
2.3.1.1	The TSI shall be responsible for documentation of all Project activities.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.2	Manuals and other System documentation shall be developed using a currently supported version of Microsoft Word. Charts and figures created in other Microsoft products (Excel, Visio, etc.) shall be embedded into the documents.	Procedural		Yes			C.1.3 Documentation Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.3.1.3	All graphs, charts, illustrations, etc. shall be produced with the aid of Computer Aided Drafting (CAD) software or other software approved by the District (e.g. Microsoft Visio).	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.4	Site drawings, including wiring diagrams, electrical drawings, control box equipment diagrams, as-built conduit runs and other civil work, shall be supplied by the TSI in AUTOCAD format without restrictions to use by the District.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.5	Project Schedules shall be developed in Microsoft Project.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.6	Draft deliverables shall be submitted electronically via e-mail or in a shared repository as approved by the District.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.7	Final deliverables/documents shall be submitted electronically in the format they were developed in as well as in PDF format, by email or in a shared repository with no read/write restrictions. An agreed to number of hard copies shall be submitted.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.8	External references to files and figures shall be avoided.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.9	Final versions of design documents and manuals shall be delivered as bound documents or in three ring binders to facilitate review and use of the documents.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.10	The left-hand margin of the sheets in the manuals shall be adequate to ensure binding without encumbering the reading of the material.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.11	Each document shall contain a title sheet, table of contents, revision log , list of figures (if applicable), list of tables (if applicable), list of reference drawings (if applicable).	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.12	With the exception of the original equipment manufacturer (OEM) standard documentation (e.g., manuals, catalogs), all manuals, section numbers, line numbers, page numbers, version numbers, records, and lists shall be printed on 8-1/2" by 11" sheets. Documents may include 11" by 17" foldouts.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.13	Terminology used shall be consistent across documents (i.e. SDD, bill of materials, drawings) for readers to easily cross reference.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.1.14	The TSI shall be responsible for updating Project documents during the life of the Project.	Procedural		Yes		Assuming "life of the Project" means 10 years per Requirement 3.2.2.1	C.1.3 Documentation Requirements
<b>2.3.2</b>	<b>System Document Review Process</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.3.2.1	All written deliverables shall be submitted by the TSI, in draft form for the District to comment and the TSI shall incorporate all comments as a part of their final submittal.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.2.2	The District shall be given 14 days to review and provide comments on all deliverables. If the deliverable is not accepted by the District the TSI shall resubmit with corrections and the District will again have 14 days to review and comment. This process will continue until the Deliverable is accepted.	Procedural		Yes		#####	C.1.3 Documentation Requirements
2.3.2.3	An additional 10 days shall be scheduled by the TSI for documents requiring Caltrans review.	Procedural					
2.3.2.4	The TSI shall submit an empty comments matrix form with each document. The District will enter its comments into the matrix and the TSI shall track its resolution for every comment in the matrix.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.2.5	The TSI shall submit additional iterations of drafts, if necessary, to fully resolve comments.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.2.6	The TSI shall comply to the review process for all required documents including the various stages of the SDD development.	Procedural		Yes			C.1.3 Documentation Requirements
<b>2.3.3</b>	<b>Document Library</b>						
2.3.3.1	The TSI shall maintain a library of all current versions of all documents (including drawings) developed, received, or acquired for or by this Project.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.3.2	The TSI shall maintain this library in a secure location with web access by all approved members of the Project team.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.3.3	All Project-related electronic files shall be fully backed up weekly.	Procedural		Yes			C.1.3 Documentation Requirements
2.3.3.4	The TSI shall maintain a shared document log to apprised of status and versions of documents in the document library.	Procedural		Yes			C.1.3 Documentation Requirements
<b>2.4</b>	<b>TESTING REQUIREMENTS</b>						
<b>2.4.1</b>	<b>General Testing Requirements</b>						
2.4.1.1	The TSI shall be responsible for the preparation of a test plan and test scripts for all tests throughout all Phases of the Project. All test plans and test scripts are subject to District approval.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.2	The TSI shall be responsible for conducting all tests throughout all Phases of the Project.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.3	The TSI shall be responsible for the collection, processing and presentation of all test data necessary to demonstrate that the test has executed successfully.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.4	The District and/or its authorized representatives shall witness and participate in all aspects of testing.	Procedural		Yes			C.1.4 Testing Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.4.1.5	Testing shall include simulating error conditions and/or legitimate toll conditions, including those generated by users, as well as System issues and the ability of the System to recover and/or operate in a degraded or less than 100% capacity mode.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.6	Back-up, archive, and restoration of data and System software shall be tested and verified.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.7	The TSI shall provide all required documentation, logistics, test sites, vehicles, and execution and management of tests as prescribed herein.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.8	The TSI shall be responsible for all personnel, equipment and expenses associated with the testing program.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.9	Successful completion of all repairs or modifications required to comply with the tests in this document shall be performed by the TSI without additional cost to the District.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.10	If a failure pattern develops during performance of testing, the District may direct that testing be stopped and that design and/or implementation modifications be made. The TSI shall analyze and categorize all defects as to whether they are limited to the specific unit or software module being tested or are potential problems for all units. In the case of defects common to multiple units, all deliverable units shall be replaced or modified without additional cost to the District. This replacement or modification includes design changes, which shall be required to pass a design review by the District.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.11	Detailed testing of the reporting application shall include unit test of each Report to ensure the accuracy, consistency and completeness of data recorded.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.12	The TSI shall include test data sufficient in size and variety of types to fully test all of the Lane and Host requirements.	Procedural		Yes			C.1.4 Testing Requirements
2.4.1.13	The District reserves the right to independently check on any quality control or quality assurance tests of the System.	Procedural		Yes			C.1.4 Testing Requirements
<b>2.4.2</b>	<b>Test Plans</b>						
2.4.2.1	The TSI shall prepare and deliver a Test Plan outline for each Test Plan 60 days prior to the scheduled start of testing activity.	Procedural		Yes			C.1.4 Testing Requirements
2.4.2.2	The TSI shall prepare and deliver a comprehensive Test Plan for each of the following Test Stages no less than 30 days prior to the start of testing: FAT, CIT, GEFT, PRT, and SAT.	Procedural		Yes			C.1.4 Testing Requirements
2.4.2.3	Test Plans shall contain a summary statement of the purpose, description of the overall test site and environment, details of the installation as appropriate, features to be tested, and formatted test scripts.	Procedural		Yes			C.1.4 Testing Requirements
2.4.2.4	Test Plans shall include specification of the hardware and software required for the test which describes the number and type of devices to be used along with block diagrams of all equipment and components used in the test configuration.	Procedural		Yes			C.1.4 Testing Requirements
2.4.2.5	Test Plans shall provide detailed descriptions of any differences and/or substitutions between hardware and software being used for testing versus what was originally proposed, approved, and/or what will be used in production.	Procedural		Yes			C.1.4 Testing Requirements

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.4.2.6	<p>Test Plans shall include detailed test scripts which:</p> <ul style="list-style-type: none"> <li>• Demonstrate that every feature and function to be provided in the furnished hardware and software conforms to the Requirements Tracability Matrix;</li> <li>• Identify the feature or function to be demonstrated as part of each test script through specific references to both the RTM and the design documents;</li> <li>• Identify the steps for each test to be performed, test purpose, conditions which shall exist at the start of the test, and conditions/results expected at the conclusion of each step of the test;</li> <li>• Identify the success/failure status of each test along with adequate space for comments from the test witnesses;</li> <li>• Describe the outputs to be provided to the District to document the test results (e.g. reports, database listings, statistical analyses, message displays)</li> </ul>	Procedural		Yes			C.1.4 Testing Requirements
2.4.2.7	The TSI shall provide a schedule for execution of the Test Plans. Each Test Plan should include an agenda, schedule of events and expected duration of the test.	Procedural		Yes			C.1.4 Testing Requirements
2.4.2.8	The Test Plan shall describe what and how real-world inputs and outputs shall be simulated, if necessary to model field conditions or external interfaces. The use of simulator data shall be pre-approved by the District.	Procedural		Yes			C.1.4 Testing Requirements
2.4.2.9	The TSI shall provide all associated test documentation, including, at a minimum, test procedures, scripts, checklists, test forms, and data summary sheets, along with the Test Plans as defined herein.	Procedural		Yes			C.1.4 Testing Requirements
<b>2.4.3</b>	<b>Test Report and Analysis</b>						
2.4.3.1	The TSI shall prepare and deliver a Test Report within 10 business days following the end of each test.	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.2	The Test Report shall contain a summary, the test conditions at start and end of each scripted test, copies of the completed test script forms, analysis of the results, and an itemized list (punch list) of unresolved items that were	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.3	If all scripted tests have passed, the report shall include a written statement or certification, from the TSI, that the System has successfully passed that specific test.	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.4	If all scripted tests are not passed successfully, the report shall include a punch list detailing all failed tests or where results differed from expected and an action plan to correct the deficiencies and conduct a retest of the failed script.	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.5	The District will review and evaluate each Test Report, including the action plan, if required, and notify the TSI of its evaluation. The TSI shall rework the Test Report and action plan to the District's satisfaction.	Procedural		Yes		#####	C.1.4 Testing Requirements
2.4.3.6	The TSI shall record the actual outcome of each test, which shall be compared with the expected outcome. Test Reports shall include System screens and/or reports to document success or failure of tests. Failure to	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.7	Any failed test shall be considered a defect, and the associated hardware/software, equipment, and/or subsystems shall be rejected by the District and subject to submittal for approval for a retest.	Procedural		Yes			C.1.4 Testing Requirements

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
2.4.3.8	The TSI shall execute the action plan for correcting deficiencies and perform the required retesting after which another Test Report shall be provided by the TSI and this process shall repeat as necessary until the test is completed successfully or until the District provides authorization to proceed to the next stage of testing.	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.9	Prior to a retest, the TSI shall prepare a report to be submitted to the District describing the root cause of the failure, the corrective action taken, and a request for retest.	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.10	The TSI shall indicate in its Test Report any equipment that has been damaged or is shown to be non-compliant with the approved design. The TSI shall be responsible to replace the deficient equipment at its own expense.	Procedural		Yes			C.1.4 Testing Requirements
2.4.3.11	Acceptance of the Test Report and test results by the District shall not relieve the TSI of the responsibility for the installed System to meet the requirements of the Contract.	Procedural		Yes			C.1.4 Testing Requirements
<b>2.4.4</b>	<b>Implementation Responsibilities</b>						
2.4.4.1	The TSI shall work with other entities as defined in subsequent sections to establish Gantry design requirements and supervise Gantry equipment installation.	Informational	Accepted			Updated per clarification 02/27/2017: This is our expectation as well. We will work closely with the Gantry Design and contractors to confirm that work has been done correctly.	C.1.4 Testing Requirements
2.4.4.2	The District will be responsible for providing power and communication feeds to the Gantry system.	Informational					
2.4.4.3	The TSI shall work with the District and the Gantry designer (Section 4) to define the placement and terminations of the power and communication lines.	Informational	Accepted			Updated per clarification 02/27/2017: This is our expectation as well. We will work closely with the Gantry Design and contractors to confirm that work has been done correctly.	C.1.4 Testing Requirements
2.4.4.4	The TSI shall work with the Gantry Contractor (Section 4) to supervise proper installation of the power and communication lines.	Informational					
2.4.4.5	The TSI shall install all Host (Section 7.1) related equipment in District specified locations.	Informational					
2.4.4.6	The TSI shall provide interconnection of Host components in the same location.	Informational					
2.4.4.7	The TSI shall connect power to the Host components from District specified outlets.	Informational	Accepted				C.1.4 Testing Requirements
2.4.4.8	The District will provide and run all power and communication lines.	Informational	Accepted				C.1.4 Testing Requirements
2.4.4.9	The Gantry Designer and Gantry Contractor will be responsible for the physical design and installation the entire Gantry System.	Informational					
2.4.4.10	The TSI shall provide all equipment, cabinets, and housings required to support the Lane system.	Informational					
<b>3</b>	<b>GENERAL REQUIREMENTS</b>						
<b>3.2</b>	<b>SYSTEM METRICS</b>						
<b>3.2.1</b>	<b>Current Volumes</b>						
3.2.1.1	The current system has the following average southbound volumes: <ul style="list-style-type: none"> <li>• Average traffic is 55522 per day</li> <li>• Peak weekday hourly traffic average is 5240 vehicles/hour</li> <li>• Average rate of valid tagged transactions is 57%, and ranges from 45% to 75% of total hourly traffic</li> </ul>	Informational	Accepted				C.2.2 System Metrics
<b>3.2.2</b>	<b>System Life</b>						

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.2.2.1	The System shall be designed, developed and furnished to support a System life of no less than 10 years from Go-Live.	Functional			Yes		C.2.2 System Metrics
<b>3.2.3</b>	<b>System Capacity</b>						
3.2.3.1	The System shall support the following: <ul style="list-style-type: none"> <li>• A peak of 2,200 vehicles per hour, per Lane</li> <li>• A maximum of 100,000 vehicles per day</li> <li>• 5% per year total traffic growth over the next ten years</li> <li>• A steady state AVI market share of 85% of Transactions per day</li> <li>• Transponder status storage for 100 million transponders</li> </ul>	Functional			Yes		C.2.2 System Metrics
<b>3.3</b>	<b>CODES, STANDARDS, AND SPECIFICATIONS</b>						
<b>3.3.1</b>	<b>Construction Codes</b>						
3.3.1.1	All design and construction shall conform to Codes, Standards and Specification relevant to public works for Highways and Bridges, including AASHTO and California Department of Transportation (Caltrans) standards and requirements.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.1.2	All communications, power, wiring, cables, enclosures, and other electrical equipment in hazardous locations shall conform to the latest version of the National Electrical Code, as well as any state or local codes and regulations.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.1.3	The TSI shall abide by current California Occupational Safety and Health Administration (OSHA) standards when designing, installing and maintaining equipment.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.1.4	The System shall comply with the pronouncements from the Financial Accounting Standards Board's (FASB), Government Accounting Standards Board (GASB), and generally accepted accounting principles (GAAP) for government financial accounting and reporting. A complete copy of the Governmental Accounting and Financial Standards may be ordered through <a href="http://www.gasb.org">www.gasb.org</a> .	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.1.5	The TSI shall, where appropriate, utilize the services of fully qualified engineers for the purpose of performing all engineering civil, structural, electrical, mechanical, and architectural design and the preparation of related plans and documentation under this Project. All engineering civil, electrical, and mechanical design work related to the TSI scope shall be performed under the direct supervision of an engineer of the appropriate discipline licensed in the state of California or an architect licensed in the state of California.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.1.6	Electrical work shall be performed by California-licensed electricians. All electrical work shall be performed in accordance with the applicable regulations.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.3.1.7	Where applicable the following codes shall apply: <ul style="list-style-type: none"> <li>• State of California Department of Transportation Standard Specifications</li> <li>• State of California Department of Transportation Standard Plans</li> <li>• National Electric Code</li> <li>• National Electrical Contractors Association (NECA)</li> <li>• National Fire Protection Association (NFPA)</li> <li>• National Electrical Manufacturers Association (NEMA)</li> <li>• Institute of Electrical and Electronic Engineers (IEEE)</li> <li>• Applicable Electronic Industries Association (EIA) Standards for Interface and Intercommunication</li> <li>• Underwriters Laboratories (UL)</li> </ul>	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
<b>3.3.2</b>	<b>Regulation and Highway Codes</b>						
3.3.2.1	The System shall permit full compliance with Sections 27564 and 27565 of the California Streets and Highways Code.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.2.2	The System shall be compliant with California Vehicle Code Section 40250 et seq, which addresses the procedures for the enforcement of toll evasion laws using electronic surveillance, image capture equipment and the California DMV to obtain the name and address of the registered owner of a vehicle that has not paid the required toll.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.2.3	The System shall be fully compliant with Sections 21655.5 (A) through 21655.5 (B) of the California Vehicles Code. These code sections address the high-occupancy lane requirements and limitations of using these lanes.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
<b>3.3.3</b>	<b>CTOC Technical Specifications</b>						
3.3.3.1	The California Toll Operators Committee (CTOC) has defined the specifications for transferring files between California toll collection agencies (interoperability). The Regional Customer Service Center (RCSC) is directly responsible for such transfers.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
3.3.3.2	The TSI shall ensure that all data necessary for successful file transfers under the CTOC Technical Specifications for Interagency Electronic Data, as of October 2016, Revision 5G is provided by the System.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	C.2.3 Codes, Standards, And Specifications
3.3.3.3	The TSI shall make all necessary System changes that are required during the Contract term to comply with the revisions to the CTOC Technical Specification, including policies and procedures changes and the addition of new member facilities.	Functional			Yes		C.2.3 Codes, Standards, And Specifications
3.3.3.4	The current CTOC technical specifications can be found in Appendix E.	Informational	Accepted				C.2.3 Codes, Standards, And Specifications
<b>3.3.4</b>	<b>FCC License</b>						
3.3.4.1	The System shall comply with all applicable Federal Communications Commission (FCC) regulations. On behalf of the District, the TSI shall ensure that the applicable licenses are currently in place or apply for and obtain the necessary FCC licenses for all the AVI equipment installed under this Contract.	Functional			Yes		C.2.3 Codes, Standards, And Specifications
<b>3.4</b>	<b>GENERIC REQUIREMENTS</b>						
<b>3.4.1</b>	<b>Physical Environment</b>						



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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.4.1.1	The TSI shall be responsible for assessing the Toll Zone's unique environment and designing the System to meet performance requirements under those conditions. Weather conditions shall not be a reason for failure to meet performance requirements.	Functional			Yes		C.2.4 Generic Requirements
3.4.1.2	The System shall be designed to operate without performance degradation in the Golden Gate Bridge's humid, corrosive, and foggy marine-adjacent environment as well as in other typical weather conditions experienced at the Golden Gate Bridge including, but not limited to, bright sunlight, rain, and wind.	Functional			Yes		C.2.4 Generic Requirements
3.4.1.3	The System shall maintain the required performance levels while taking into consideration the possible conditions of Golden Gate Bridge roadway including, but not limited to, oil, standing water or other degraded roadway conditions.	Functional			Yes		C.2.4 Generic Requirements
3.4.1.4	All equipment supplied by the TSI shall operate in the electromagnetic environment present at the Golden Gate Bridge without any errors or degradations due to Electromagnetic Interference (EMI) or interference to the surrounding environment.	Functional			Yes	Kapsch will provide input into civil design to preclude interference from the old toll system.	C.2.4 Generic Requirements
3.4.1.5	Lane equipment and enclosures shall be protected from corrosion, especially electrical connectors which must be removed and reconnected during preventive or corrective maintenance.	Functional			Yes		C.2.4 Generic Requirements
<b>3.4.2</b>	<b>Cabinets and Enclosures</b>						
3.4.2.1	In cases where equipment must be mounted on or near the Gantry, roadside cabinets required to house such equipment shall adhere to applicable District electrical standards.	Functional			Yes		C.2.4 Generic Requirements
3.4.2.2	All roadside electronic components shall be enclosed in outdoor, watertight, NEMA 4X cabinets or housings with an IP rating of 66 or better.	Functional			Yes	Roadside cabinet is NEMA 4X. ALPR cameras are IP66. DVAS cameras are IP67.	C.2.4 Generic Requirements
3.4.2.3	All cabinets, housings, mounting hardware and fasteners shall be stainless steel or marine grade aluminum whenever practical.	Functional			Yes	Roadside cabinet is stainless steel.	C.2.4 Generic Requirements
3.4.2.4	All conduit, Tees, and couplings shall be the epoxy coated type such as Ocal or Rob Roy.	Functional			Yes	The TSI complies with all items that are TSI responsibility.	C.2.4 Generic Requirements
3.4.2.5	Door frame openings shall be flanged on all four sides to prevent ingress of liquid and dust when door is opened.	Functional			Yes	This is part of our standard procured NEMA 4X roadside cabinet.	C.2.4 Generic Requirements
3.4.2.6	Exterior cabinets shall have no exterior seams.	Functional			Yes	This is part of our standard procured NEMA 4X roadside cabinet.	C.2.4 Generic Requirements
3.4.2.7	Large cabinets shall include a switch and light to illuminate the contents of the cabinet.	Functional			Yes		C.2.4 Generic Requirements
3.4.2.8	All cabinet chambers shall be electrically grounded. All cabinet doors shall be equipped with ground straps.	Functional			Yes		C.2.4 Generic Requirements
3.4.2.9	All electrical outlets installed in cabinets shall be duplex ground fault receptacles.	Functional					
3.4.2.10	All cabinets shall be approved by the District.	Functional			Yes	Updated per Clarifications 02/27/2017: We agree all relevant requirements and information will be reviewed, tested and accepted to meet approval.	C.2.4 Generic Requirements
<b>3.4.3</b>	<b>Equipment Requirements</b>						
3.4.3.1	The System shall utilize new, commercial off-the-shelf (COTS), field-proven equipment and communication cables. Use of custom, non-COTS equipment shall require District approval.	Functional			Yes		C.2.4 Generic Requirements
3.4.3.2	The System shall have modular, replaceable and repairable parts.	Functional			Yes	In Kapsch standard solution all parts fit into one of these three categories.	C.2.4 Generic Requirements
3.4.3.3	Parts which serve the same function shall be interchangeable.	Functional			Yes	Part of Kapsch standard solution.	C.2.4 Generic Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.4.3.4	All hardware and software shall have a minimum service life that extends through the life of the System.	Functional			Yes	Assuming "service life" means 10 years per Requirement 3.2.2.1	C.2.4 Generic Requirements
3.4.3.5	All roadside components shall be rated to operate in a temperature range of minus 5 degrees Celsius to plus 60 degrees Celsius with no degradation in performance.	Functional					
3.4.3.6	All roadside components shall be rated to operate in a relative humidity range of 5% to 100% for equipment installed in an outside environment and 5% to 95% non-condensing humidity for equipment installed inside cabinets and equipment racks.	Functional			Yes		C.2.4 Generic Requirements
3.4.3.7	All mounting bolts shall be assembled using "Never-Seize" or other corrosion resistant product.	Functional			Yes	Kapsch will ensure that such a compound is used for this installation	C.2.4 Generic Requirements
3.4.3.8	All field wiring shall be terminated with standard COTS connectors, rated for outdoor installation and self-locking to prevent accidental disconnection.	Functional			Yes	Kapsch will ensure that approach is implemented for this installation	C.2.4 Generic Requirements
3.4.3.9	All wiring and cabling, including copper data and power cables, shall be neatly labeled, bundled, tie-wrapped, and secured. Wire labels shall be plastic permanent-type labels. All wiring and cable labels shall match annotations on as-built drawings	Functional			Yes	Part of Kapsch standard implementation practices.	C.2.4 Generic Requirements
3.4.3.10	All field wiring shall be secured with strain relief, and provided with sufficient slack so as not to interfere with adjustment, repositioning, or replacement of hardware.	Functional			Yes	Part of Kapsch standard implementation practices.	C.2.4 Generic Requirements
3.4.3.11	The TSI shall label everything installed as a part of the System including but not limited to equipment, cables, and conduit. The District shall have final approval of such labeling. The labeling shall enable efficient maintenance and inventory.	Functional			Yes	Part of Kapsch standard implementation practices.	C.2.4 Generic Requirements
3.4.3.12	All equipment shall be installed, configured and tested in strict accordance with the original manufacturer's instructions. The manufacturer's printed or verbal recommended installation procedures and instructions for all materials furnished by the TSI under this Contract shall be followed explicitly, unless otherwise directed by the District.	Functional			Yes	Kapsch will ensure that approach is implemented for this installation	C.2.4 Generic Requirements
3.4.3.13	Surge suppression shall be provided for all field wiring susceptible to lightning or other potential electrical surges.	Functional			Yes	Part of Kapsch standard implementation practices.	C.2.4 Generic Requirements
<b>3.4.4</b>	<b>Time Synchronization Requirements</b>						
3.4.4.1	All System equipment dependent on time functions shall synchronize with a System network time server using standard Network Time Protocol (NTP).	Functional			Yes		C.2.4 Generic Requirements
3.4.4.2	The System shall include both primary and secondary NTP servers.	Functional			Yes		C.2.4 Generic Requirements
3.4.4.3	All System equipment that utilize NTP shall automatically utilize the primary or secondary NTP server as appropriate.	Functional			Yes		C.2.4 Generic Requirements
3.4.4.4	Time synchronization shall be performed whenever a device is started and no less frequently than hourly thereafter.	Functional			Yes		C.2.4 Generic Requirements
3.4.4.5	The System shall automatically adjust time of day in accordance with the start and end of Daylight Savings Time.	Functional			Yes		C.2.4 Generic Requirements
3.4.4.6	The System shall log any failure to communicate with the NTP server and generate appropriate Alerts.	Functional			Yes	This is part of Kapsch standard design approach to provide such alerts through the ROMS	C.2.4 Generic Requirements
3.4.4.7	If any Lane level equipment does not support NTP, the Zone Controller shall be responsible for keeping the equipment's time synchronized.	Functional			Yes	This is part of Kapsch standard design approach	C.2.4 Generic Requirements
<b>3.4.5</b>	<b>Single Point of Failure</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
3.4.5.1	The TSI shall provide a System design that minimizes the effect of any single point of failure.	Functional			Yes	This is part of Kapsch standard design approach	C.2.4 Generic Requirements
3.4.5.2	No single point of failure shall cause more than one lane to become unavailable.	Functional					
3.4.5.3	Proposers shall discuss the design concepts that accomplish the above requirement.	Proposal	Accepted				C.2.4 Generic Requirements
<b>3.4.6</b>	<b>Use of Original Supplier</b>						
3.4.6.1	The TSI shall utilize the original supplier or equipment manufacturer to calibrate, test and certify the operation of each critical System component both at the time of installation and at least annually during the maintenance period.	Functional					
<b>3.4.7</b>	<b>Source Code</b>						
3.4.7.1	The TSI shall deliver all materials, executable software, configuration files and related documentation in compliance with the Agreement regarding System Source Code.	Procedural		Yes			C.2.4 Generic Requirements
3.4.7.2	Prior to System acceptance, source code shall be deposited in escrow using an escrow agent agreed to by both TSI and the District.	Procedural		Yes			C.2.4 Generic Requirements
3.4.7.3	Source code documentation shall be sufficient to allow for compiling and testing of the source code including at a minimum a list of applicable proprietary software development tools used to implement the System.	Procedural		Yes			C.2.4 Generic Requirements
3.4.7.4	Source code documentation shall provide detail on the third-party commercially available software used in conjunction with the System including name, version, sub-version number and release date.	Procedural		Yes			C.2.4 Generic Requirements
3.4.7.5	The source code deposit shall also include documentation on how the third-party commercially available software is linked to the System software.	Procedural		Yes			C.2.4 Generic Requirements
3.4.7.6	Source code deposits into the escrow system shall occur upon transition to the new System and within a month of any changes to the system source code.	Procedural		Yes			C.2.4 Generic Requirements
3.4.7.7	Throughout the life of the Project the TSI shall use in an industry standard source code change management system.	Procedural		Yes		Assuming "life of the Project" means 10 years per Requirement 3.2.2.1	C.2.4 Generic Requirements
<b>3.4.8</b>	<b>Bill of Materials</b>						
3.4.8.1	The TSI shall prepare and submit a Bill of Materials List that includes parts and components making up each device implemented under this project.	Procedural		Yes			C.2.4 Generic Requirements
3.4.8.2	The Bill of Materials shall list part numbers at the field replacement unit level. The TSI shall provide further details, as necessary, in design or maintenance documents.	Procedural		Yes			C.2.4 Generic Requirements
3.4.8.3	An updated Bill of Materials should be delivered no later than thirty (30) days after the Gantry is commissioned and the System acceptance testing has begun.	Procedural		Yes			C.2.4 Generic Requirements
3.4.8.4	TSI shall provide a Bill of Materials Tracking Report to track the acquisition of equipment as approved in the final SDD, including approved spare parts.	Procedural		Yes			C.2.4 Generic Requirements
3.4.8.5	The Bill of Materials Tracking Report shall be delivered with the monthly schedule to show materials that have been ordered, delivered and paid for by the TSI and indicate any deviations from the bill of materials as listed in the approved SDD.	Procedural		Yes			C.2.4 Generic Requirements
<b>4</b>	<b>Gantry Requirements</b>						
<b>4.1</b>	<b>General Gantry Concepts</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
<b>4.2</b>	<b>Gantry Phases</b>						
<b>4.2.1</b>	<b>Gantry Responsibilities - Proposal</b>						
4.2.1.1	The Proposer shall describe the Gantry requirements to support the proposed System. This shall include, but not be limited to: single or double Gantry, Gantry spacing or width and required in-pavement devices.	Proposal	Accepted				D.1.2 Gantry Phases
4.2.1.2	The Proposer shall describe the equipment that would be mounted overhead, in-pavement, and adjacent to the Gantry.	Proposal	Accepted				D.1.2 Gantry Phases
4.2.1.3	The Proposer shall describe the required, or desired, environmental protections (e.g., roof, enclosures, heating, etc.) of the Gantry.	Proposal	Accepted				D.1.2 Gantry Phases
4.2.1.4	The Proposer shall indicate their understanding that the District requires that all equipment and interconnections can be repaired and/or replaced from the Gantry without closing a lane to traffic.	Proposal	Accepted				D.1.2 Gantry Phases
4.2.1.5	The Proposer's preferred Gantry type (single or double) will not be included in the scoring of Proposals	Informational	Accepted				D.1.2 Gantry Phases
<b>4.2.2</b>	<b>Gantry Responsibilities - Phase 1 Business Rules and System Requirements Definition</b>						
4.2.2.1	The TSI shall appoint a Gantry Requirements Coordinator to work with and provide input to the District and Gantry Designer from Phase 1 through Phase 5.	Procedural		Yes			D.1.2 Gantry Phases
4.2.2.2	The TSI shall provide to the District a Gantry Requirements Document which is an initial list of Gantry requirements and concepts. This includes: <ul style="list-style-type: none"> <li>• Single or double Gantry</li> <li>• Gantry spacing (if double Gantry)</li> <li>• Roadway width of each Gantry</li> <li>• Gantry height and clearance</li> <li>• Environmental Protections</li> <li>• Sketch of Gantry indicating component locations</li> <li>• Component manufacturers mounting instructions</li> <li>• Power and communication connection requirements</li> <li>• Concepts to incorporate ways that the Gantry equipment can be moved laterally to accommodate changes in lane striping</li> </ul>	Functional					
<b>4.2.3</b>	<b>Gantry Responsibilities - Phase 2 System Design</b>						
4.2.3.1	The Gantry Requirements Coordinator shall be available for comments or to answer questions regarding the System during Gantry design.	Procedural		Yes			D.1.2 Gantry Phases
4.2.3.2	The Gantry Requirements Coordinator shall attend scheduled review meetings with the Gantry Designer during this Phase.	Procedural		Yes			D.1.2 Gantry Phases
4.2.3.3	The TSI shall, in coordination with the District and Gantry Designer, ensure that the Gantry design will meet the needs of the TSI proposed architecture and environmental protection requirements.	Procedural		Yes			D.1.2 Gantry Phases
4.2.3.4	The TSI shall review the Gantry design documents and note any necessary issues or changes.	Functional			Yes	This is part of Kapsch standard project practises	D.1.2 Gantry Phases
4.2.3.5	The TSI shall use the final detailed Gantry design, provided by the Gantry designer, to produce drawings indicating the actual placement of Gantry equipment, conduits, communication, power, and cabinets. These drawings shall be included in the SDD.	Functional			Yes	This is part of Kapsch standard project practises	D.1.2 Gantry Phases

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4.2.3.6	The TSI shall provide its approval to the District on the Gantry design with respect to Gantry dimensions, equipment placement, protection from the elements, power requirements, and physical network requirements.	Functional			Yes	This is part of Kapsch standard project practises	D.1.2 Gantry Phases
<b>4.2.4</b>	<b>Gantry Responsibilities - Phase 3 System Development</b>						
4.2.4.1	The Gantry Requirements Coordinator shall be available for comments or to answer questions regarding the System during Gantry construction.	Procedural		Yes			D.1.2 Gantry Phases
4.2.4.2	The Gantry Requirements Coordinator shall attend scheduled review meetings with the Gantry Contractor and/or Gantry Designer during this Phase.	Procedural		Yes			D.1.2 Gantry Phases
4.2.4.3	The TSI shall provide its approval to the District on the Gantry construction with respect to physical dimensions, equipment locations, protection from the elements, power service panels, and conduits.	Procedural		Yes			D.1.2 Gantry Phases
<b>4.2.5</b>	<b>Gantry Responsibilities - Phase 4 Installation</b>						
4.2.5.1	The TSI shall supervise and inspect the installation of all equipment required to support the System.	Procedural		Yes			D.1.2 Gantry Phases
4.2.5.2	The Gantry Requirements Coordinator shall attend scheduled review meetings as necessary with the Gantry Designer and/or Gantry Contractor during the Installation Phase.	Procedural		Yes			D.1.2 Gantry Phases
4.2.5.3	The TSI shall provide its approval to the District on the Gantry installation with respect equipment installation, power and data wiring, and connections.	Procedural		Yes			D.1.2 Gantry Phases
4.2.5.4	The TSI shall setup, align, calibrate, and test all System equipment following the equipment installation.	Functional			Yes	This is part of Kapsch standard project practises	D.1.2 Gantry Phases
<b>4.2.6</b>	<b>Gantry Responsibilities - Phase 5 Transition</b>						
4.2.6.1	The Gantry Requirements Coordinator shall communicate and oversee any changes required to the Gantry that become necessary during the Transition Phase.	Functional			Yes	This is part of Kapsch standard project practises	D.1.2 Gantry Phases
<b>5</b>	<b>LANE REQUIREMENTS</b>						
<b>5.1</b>	<b>GENERAL LANE REQUIREMENTS</b>						
<b>5.1.1</b>	<b>Operational Requirements</b>						
5.1.1.1	The TSI shall furnish and install a Lane which shall implement an open road all-electronic tolling system.	Functional			Yes		D.2.1 General Lane Requirements
5.1.1.2	The Lane shall be an industrial system designed to operate reliably in harsh environments. Its components and design will adhere to all applicable electrical and mechanical standards for industrial and traffic equipment.	Functional			Yes		D.2.1 General Lane Requirements
5.1.1.3	The TSI shall design the Lane electrical system such that if either District supplied AC feed should fail the second AC feed will keep the Lane equipment operational.	Functional			Yes		D.2.1 General Lane Requirements
5.1.1.4	The TSI shall design the Lane electrical system such that restoration of a failed District supplied UPS shall not cause an interruption in service.	Functional			Yes		D.2.1 General Lane Requirements
5.1.1.5	The Lane shall provide for self-testing and sensors to determine failures and, as much as practical, allow for remote maintenance, calibration, and monitoring.	Functional			Yes	Kapsch' Remote Operations & Maintenance System (ROMS) and Kapsch lane equipment are designed to support self-testing and remote maintenance, to the extent practical.	D.2.1 General Lane Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.1.1.6	The Lane shall create Transactions for every vehicle detected in the Toll Zone at all times.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
5.1.1.7	The Lane shall create and transmit all Transactions to the Host in real-time.	Functional			Yes	Lane transactions are transmitted to the Host as quickly as the communications links permit.	D.2.1 General Lane Requirements
<b>5.1.2</b>	<b>Host Communication</b>						
5.1.2.1	The Lane shall communicate with the Host via bi-directional messages.	Functional			Yes	It is standard Kapsch design practice to use guaranteed delivery procedures for transfers of data toward the host, and these procedures include acknowledgement feedback to the data source.	D.2.1 General Lane Requirements
5.1.2.2	The Lane shall send Transaction messages to the Host.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
5.1.2.3	The Lane shall send Alert messages to the Host.	Functional			Yes	The ROMS in the lane will send them to the ROMS in the Host.	D.2.1 General Lane Requirements
5.1.2.4	The Lane shall send equipment status messages to the Host.	Functional			Yes	The ROMS in the lane will send them to the ROMS in the Host.	D.2.1 General Lane Requirements
5.1.2.5	The Lane shall receive and process command messages from the Host.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
5.1.2.6	The Lane shall receive and process Transponder Status Files from the Host.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
5.1.2.7	The Lane shall receive and process Carpool Hours data from the Host.	Functional			Yes	Carpool hours are used within the proposed system to select the correct toll price. However, this is performed at the Host and not in the Lane.	D.2.1 General Lane Requirements
5.1.2.8	The Lane shall send and receive/process any other data/messages necessary to meet the operational and performance requirements of the System.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
<b>5.1.3</b>	<b>Transaction Types</b>						
5.1.3.1	Toll Transaction - The Lane shall create one and only one Toll Transaction for each vehicle passing through the Toll Zone.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
5.1.3.2	Isolated Transponder Transaction - The Lane shall support a Transaction type herein referred to as an Isolated Transponder Transaction, defined as a Transaction with AVI data but no vehicle data. The Lane shall create one Isolated Transponder Transaction for each real time transponder read which could not be associated with a vehicle.	Functional			Yes	Standard configuration option for Kapsch host software	D.2.1 General Lane Requirements
5.1.3.3	Buffered Transponder Transaction - The Lane shall support a Transaction type herein referred to as a Buffered Transponder Transaction, defined as a Transaction with AVI data resulting from a transponder read which was buffered by the AVI reader and not delivered in real time to the Lane. The Lane shall create one Buffered Transponder Transaction for each buffered transponder read.	Functional			Yes	Standard configuration option for Kapsch host software	D.2.1 General Lane Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.1.3.4	Buffered Image Transaction - The Lane shall support a Transaction type herein referred to as a Buffered Image Transaction, defined as a Transaction with image data resulting from an image capture which was buffered by the Image Capture System (ICS) and not delivered in real time. The Lane shall create one Buffered Image Transaction for each buffered image.	Functional			Yes	Standard configuration option for Kapsch host software	D.2.1 General Lane Requirements
5.1.3.5	The Lane shall identify each of the different Transaction types by means of an identifier field, flag, or other means which shall allow filtering and querying of Transactions by type.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
5.1.3.6	The Lane shall further designate Toll Transactions with a sub-type of either AVI, a Toll Transaction with a valid transponder at the time the Toll Transaction was created, or Image Based Toll (IBT), a Toll Transaction with an invalid transponder or no transponder at the time the Toll Transaction was created.	Functional			Yes	This is part of Kapsch standard design approach	D.2.1 General Lane Requirements
<b>5.1.4</b>	<b>Vehicle Processing</b>						
5.1.4.1	The Lane shall accurately detect and track vehicles as they pass through the Toll Zone.	Functional			Yes	Vehicles are detected with sufficient accuracy to meet the "Correct Transaction" accuracy of 99.5% in Requirement 11.1.3.2	D.2.1 General Lane Requirements
5.1.4.2	The Lane shall properly correlate the AVI, Automatic Vehicle Classification (AVC) and Image Capture information for each and every vehicle that traverses the Toll Zone and shall incorporate that information into Transaction records.	Functional			Yes	Vehicles are detected with sufficient accuracy to meet the "Correct Transaction" accuracy of 99.5% in Requirement 11.1.3.2	D.2.1 General Lane Requirements
5.1.4.3	The Lane shall associate at most one transponder with any vehicle as part of a Toll Transaction.	Functional			Yes	Standard configuration option for Kapsch host software	D.2.1 General Lane Requirements
5.1.4.4	The Lane shall identify all transponder reads in a vehicle. The rules for which transponder shall be assigned to the vehicle and which shall generate Isolated Transponder Transactions shall be configurable by various parameters including, but not limited to: transponder status, transponder protocol, etc. The details of the rules and parameters shall be determined during the System Design Phase.	Functional			Yes	Standard configuration option for Kapsch host software	D.2.1 General Lane Requirements
5.1.4.5	The Lane shall be designed to properly process vehicles straddling two travel lanes as well as vehicles tailgating, stopping or traveling a various speed through the Toll Zone.	Functional			Yes	The proposed solution uses Idris loops and overhead nVDC, to fully address this requirement	D.2.1 General Lane Requirements
5.1.4.6	The Lane design shall not allow any event, sequence of events, weather condition, incorrect vehicle processing, or unusual activity such as a vehicle traveling in the opposite direction of normal traffic flow, to prevent the System from automatically re-synchronizing and properly processing vehicles within two vehicles passing through the Toll Zone in the correct direction following the event.	Functional			Yes	The proposed solution uses Idris loops and overhead nVDC, to fully address this requirement	D.2.1 General Lane Requirements
5.1.4.7	The Lane shall ensure that all Transactions of each type are uniquely and sequentially numbered as sent to the Host. This Lane Transaction ID number shall be independent of time, date, and Lane number.	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
5.1.4.8	The Lane Transaction ID shall be used to associated the Transaction with the ICS images of the vehicle.	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
5.1.4.9	The Lane shall provide a means of retransmitting selected previously sent Transactions, Alerts, Images, files and any other data to the Host.	Functional			Yes	Re-transmission where needed is inherent in any guaranteed transfer protocol	D.2.1 General Lane Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.1.4.10	The Lane shall be capable of operating off-line from the Host for a minimum of 60 consecutive days with no loss of data.	Functional			Yes		D.2.1 General Lane Requirements
5.1.4.11	The Lane shall provide a means for offloading Lane data for delivery to the Host in the event of sustained communications failure.	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
5.1.4.12	The Lane shall transmit buffered data in a first-in-first-out fashion to the Host.	Functional			Yes	Kapsch standard lane solution can be configured to enforce this rule.	D.2.1 General Lane Requirements
5.1.4.13	The Lane shall generate appropriate Alerts whenever there is an indication of data loss or failure of normal operations.	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
5.1.4.14	The Lane shall indicate the operational status of its various sensors, including but not limited to AVI, AVC, and ICS, within each Transaction (i.e., Lane health)	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
5.1.4.15	The Lane shall utilize the transponder read data provided by the AVI reader to populate the Transaction messages sent to the Host. The read data will depend on the protocol of the transponder.	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
5.1.4.16	The Lane shall ensure transmission of a complete and accurate Transaction record, including date and time, unique Transaction identifier, and other relevant data elements.	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
5.1.4.17	Transactions generated by the Zone Controller shall include, but not be limited to, the following data: <ul style="list-style-type: none"> <li>• Lane Transaction ID</li> <li>• Transaction Type</li> <li>• Entry Time – Date/time vehicle first detected in the Toll Zone</li> <li>• Exit Time – Date/time vehicle exited the Toll Zone</li> <li>• AVI Protocol Indicator</li> <li>• Transponder Data (including switch status)</li> <li>• Transponder status</li> <li>• AVC data (e.g., axles, profile, etc.)</li> <li>• Vehicle speed</li> <li>• Travel lane number</li> <li>• Carpool hours flag</li> <li>• Sensor status data</li> <li>• ALPR data and confidence levels (if ALPR is done in the Lane)</li> </ul>	Functional			Yes	This is part of Kapsch standard lane solution.	D.2.1 General Lane Requirements
<b>5.2</b>	<b>ZONE CONTROLLERS</b>						
<b>5.2.1</b>	<b>Zone Controller Hardware</b>						
5.2.1.1	The TSI shall furnish and install a pair of industrial grade Zone Controllers for control of the Lane level equipment.	Functional					
5.2.1.2	The Primary Zone Controller shall collect all sensor inputs, control all Lane devices and shall interface to the Host and other systems as necessary to implement the functionality defined herein.	Functional			Yes		D.2.2 Zone Controllers
5.2.1.3	The Zone Controller shall employ industry standard, commercial, off-the-shelf (COTS) components. Non-COTS Zone Controller hardware may be considered for use, subject to District approval. However, for the non-COTS hardware to be approved, all operation manuals, drawings and instructions that enable construction and assembly, installation, repair, and modification of the hardware, as well as property and use rights sufficient to use the drawings for these purposes, are to be provided to the District.	Functional			Yes		D.2.2 Zone Controllers



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.2.1.4	The Zone Controllers shall be equipped with sufficient processing, storage, and memory capacity to meet the traffic speeds and volumes as required herein.	Functional			Yes		D.2.2 Zone Controllers
5.2.1.5	The Zone Controllers shall be installed in cabinets on a pad adjacent to the Gantry. Alternate Zone Controller locations may be considered, subject to District approval. The pad, if used, will be part of the Gantry design and installation done by others.	Functional			Yes	Kapsch will provide zone controllers and cabinets which Kapsch will install on pads provided by others.	D.2.2 Zone Controllers
5.2.1.6	The Zone Controllers shall utilize redundant components to minimize the impact of individual hardware failures. These components shall include, but not be limited to, redundant hot-swappable power supplies and redundant, hot-swappable cooling fans	Functional			Yes	The proposed solution exceeds the Zone Controller redundancy requirements by providing two hot-swappable Zone Controller servers, each of which have several hot-swappable modules.	D.2.2 Zone Controllers
5.2.1.7	The Zone Controllers shall utilize solid state drives.	Functional					
5.2.1.8	The pair of Zone Controllers shall be configured to operate in a master/slave configuration with automatic failover from one to the other as necessary to ensure continuous service.	Functional			Yes	Kapsch exceeds redundancy requirements by providing an active-active Zone Controller redundancy configuration and letting the Host determine if fail-over is appropriate, in which case it uses the message stream from the redundant unit.	D.2.2 Zone Controllers
5.2.1.9	The failover from one Zone Controller to the other shall be transparent to the rest of the System and shall not require manual intervention, reconfiguration of any other devices.	Functional			Yes	Kapsch exceeds redundancy requirements by providing an active-active Zone Controller redundancy configuration and letting the Host determine if automatic fail-over is appropriate, in which case it uses the message stream from the redundant unit.	D.2.2 Zone Controllers
5.2.1.10	Failover from one Zone Controller to the other shall not require more than 10 seconds during which time transponder numbers and images may be buffered.	Functional			Yes	Kapsch exceeds redundancy requirements by providing an active-active Zone Controller redundancy configuration and letting the Host determine if fail-over is appropriate, in which case it uses the message stream from the redundant unit.	D.2.2 Zone Controllers
5.2.1.11	The TSI shall not be penalized for the loss of transactions during the failover time provided transponders and images are buffered and recovered.	Functional			Yes	Kapsch exceeds redundancy requirements by providing an active-active Zone Controller redundancy configuration. This means no transactions, images or transponders are lost.	D.2.2 Zone Controllers
5.2.1.12	The failover from one Zone Controller to the other shall not cause an overlap or gap in Transaction ID numbering.	Functional			Yes	Kapsch exceeds redundancy requirements by providing an active-active Zone Controller redundancy configuration. The Host verifies that there is no gap in transaction ID numbering for either Zone Controller at time of fail-over.	D.2.2 Zone Controllers
5.2.1.13	The trigger for Zone Controller failover and back shall be defined in the design phase.	Functional			Yes	Kapsch' active-active redundancy configuration exceeds requirements. During the design phase, Kapsch will seek District concurrence on the criteria the Host should use to switch back to the primary Zone Controller.	D.2.2 Zone Controllers
5.2.1.14	A utility shall be provided to allow maintenance personnel to remotely switch between using the primary Zone Controller from and to the secondary Zone Controller.	Functional			Yes	Kapsch' active-active redundancy configuration exceeds requirements. Maintenance personnel can access a utility screen with the Kapsch Remote Operations & Maintenance software to switch between prime and redundant Zone Controllers	D.2.2 Zone Controllers
5.2.1.15	During the Maintenance Phase the TSI shall periodically alternate the Primary and Secondary Zone Controllers to ensure they are functioning properly.	Functional			Yes	During the Maintenance Phase Kapsch personnel will access a utility screen with the Kapsch Remote Operations & Maintenance software to periodically switch between prime and redundant Zone Controllers	D.2.2 Zone Controllers

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.2.1.16	All failover events, whether automatic or manually triggered, shall be logged and generate appropriate Alerts.	Functional			Yes	Kapsch Remote Operations & Maintenance software will be configured to generate appropriate Alerts and logs for every failover event, whether manual or automatic.	D.2.2 Zone Controllers
5.2.1.17	In the event that communication is lost to the Host, the Zone Controller shall be capable of operating unattended, autonomously, on a continuous basis, and shall not require human intervention for purposes other than for maintenance.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.1.18	In the event the Zone Controller is unable to communicate with the Host, the Zone Controller shall buffer all data normally transmitted to the Host.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.1.19	Buffered Zone Controller data shall be automatically transmitted in a first-in-first-out fashion upon resuming normal communications with the Host.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.1.20	The Zone Controller shall have the capability to replay/retransmit data already transmitted to the Host to address situations where there may have been data loss at the Host.	Functional			Yes		D.2.2 Zone Controllers
5.2.1.21	The Zone Controller data replay function shall be accessible only to authorized users.	Functional			Yes		D.2.2 Zone Controllers
5.2.1.22	To address periods of extended communications failure, the Zone Controller and Host shall provide functions for authorized users to transfer data between these systems via a removable, local storage device in a secure manner.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.1.23	Data off-loaded from the Zone Controller shall remain on the Zone Controller and, upon resuming normal communications, the Zone Controller shall verify that all off-loaded data has been successfully received by the Host.	Functional			Yes	Data off-loaded from the Zone Controller shall remain on the Zone Controller except for deletions permitted under Requirement 5.5.1.15	D.2.2 Zone Controllers
<b>5.2.2</b>	<b>Zone Controller Operating System</b>						
5.2.2.1	The Zone Controller shall utilize an industrial-grade, real-time Operating System.	Functional					
5.2.2.2	The Zone Controller Operating System shall provide for real-time operation, multi-tasking support, process level scheduling and priority configuration.	Functional			Yes		D.2.2 Zone Controllers
5.2.2.3	The TSI shall have utilized the Zone Controller Operating System on at least one previous ORT toll system project that has completed operational acceptance.	Functional			Yes		D.2.2 Zone Controllers
<b>5.2.3</b>	<b>Zone Controller Database</b>						
5.2.3.1	Any Database software used by the Zone Controllers or other Lane components shall be COTS software.	Functional					
<b>5.2.4</b>	<b>Zone Controller Logs</b>						
5.2.4.1	The Zone Controller shall generate Operating System logs recording System startup, shutdown, and operation of System services.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.4.2	The Zone Controller shall generate access logs recording all remote and local access to the Zone Controller.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.4.3	The Zone Controller shall generate security logs recording all successful and failed attempts to access the Zone Controller.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.4.4	The Zone Controller shall generate application logs recording Zone Controller application startup, shutdown, Transaction activity, file uploads and downloads, and remote requests.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.2.4.5	The Zone Controller shall generate process logs recording detailed application process events. Process logs shall support a "logging level" which shall control the level of detail recorded in the log. Each Zone Controller software process shall have its own distinct log for recording events.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.4.6	Each Zone Controller software process shall have its own distinct log for recording events.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
5.2.4.7	In addition to application and system logs, the Zone Controller shall generate a separate and distinct "event" log which shall contain a detailed listing of all sensor events in the order in which they were received. Each sensor event shall contain a timestamp of when the event occurred. The timestamp shall be to the millisecond level or finer if possible. The event log shall also contain sufficient information to tie back events to distinct Transactions.	Functional			Yes	This is part of Kapsch standard solution	D.2.2 Zone Controllers
<b>5.3</b>	<b>AUTOMATIC VEHICLE IDENTIFICATION (AVI) SYSTEM</b>						
<b>5.3.1</b>	<b>AVI Requirements</b>						
5.3.1.1	The TSI shall furnish and install a tri-protocol AVI system to read transponders passing through the Toll Zone.	Functional			Yes	The proposed toll system includes Sirit AVI readers	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.2	The AVI system shall incorporate redundant readers to mitigate the inability to read transponders.	Functional			Yes	The proposed solution permits each AVI antenna to be switched between prime and redundant Sirit AVI readers.	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.3	The AVI system shall initially support Title-21 (see Section 5.3.2) and 6C protocol transponders and shall be fully interoperable with all transponders issued by CTOC agencies.	Functional			Yes	The proposed toll system includes Sirit AVI readers	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.4	The TSI shall deactivate the third protocol under this scope of work.	Functional			Yes	The proposed toll system includes Sirit AVI readers	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.5	The TSI shall enter into appropriate non-disclosure agreements with the AVI vendor as necessary to allow the TSI, acting as the District's agent, to develop interfaces to the AVI equipment.	Functional			Yes		D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.6	The TSI shall perform an RF spectrum survey at the proposed Toll Zone and identify and accommodate any site conditions (including electromagnetic interference) that may potentially degrade the performance of the AVI system.	Functional			Yes	Kapsch standard design practice for toll systems	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.7	The AVI system shall correctly process transponders in vehicles passing through the Toll Zone at all speeds from stop-and-go, bumper-to-bumper traffic to 100 miles per hour while meeting the performance requirements set forth within this RFP.	Functional			Yes	Kapsch standard design practice for toll systems	D.2.3 Automatic Vehicle Identification (AVI) System

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5.3.1.8	The AVI system shall provide full coverage on and between all travel lanes in the Toll Zone.	Functional			Yes	Kapsch standard design practice for toll systems	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.9	The AVI system shall be configured and tuned by a professional with documented experience with the AVI system.	Functional			Yes	Kapsch standard design practice for toll systems	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.10	The Lane shall be designed, configured and tuned to eliminate the potential for cross lane reads, transponder pass backs, transponder pass forwards and other AVI assignment errors. This shall also apply to the typical performance differences between interior mounted transponders and license plate mounted transponders.	Functional			Yes	Kapsch standard design practice for toll systems	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.11	The AVI system shall transmit data to the Zone Controller for each transponder read.	Functional			Yes	Kapsch standard design practice for toll systems	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.12	Writing to transponders is not required.	Functional			Yes	The proposed toll system will be configured to not write to transponders	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.13	The Lane shall provide the capability to remotely view and modify all software-configurable parameters of the AVI reader.	Functional			Yes	The proposed toll system includes Sirit AVI readers	D.2.3 Automatic Vehicle Identification (AVI) System
5.3.1.14	Loss of communication to any port on the AVI reader shall be immediately detected by the Lane and an appropriate Alert message generated.	Functional			Yes		D.2.3 Automatic - Vehicle Identification (AVI) System
5.3.1.15	The date and time associated with Transactions generated from buffered transponder reads shall be the date and time the transponder was read as indicated by the AVI Reader, not the date and time it was received by the Zone Controller	Functional			Yes		D.2.3 Automatic - Vehicle Identification (AVI) System
5.3.1.16	The System shall adhere to all AVI Reader synchronization requirements for purposes of avoiding mutual interference between readers, channels, and antennas.	Functional			Yes		D.2.3 - Automatic Vehicle
5.3.1.17	The AVI system shall properly detect and report the state of the HOV switch on switchable transponders.	Functional			Yes		D.2.3 Automatic - Vehicle Identification (AVI) System
5.3.1.18	The Lane shall ensure that only one Toll Transaction is created by or associated with one multi-protocol transponder per the business rules. Other protocol reads from the same transponder shall result in Isolated	Functional			Yes	Kapsch APEX zone controller software will be configured to support this.	D.2.3 Automatic Vehicle

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.3.1.19	The AVI system shall be compliant with IBTTA North American Toll Interoperability Program Electronic Toll Collection Protocol Requirements (see <a href="http://ibttta.org/sites/default/files/documents/IOP/Final%20NIOP%20Requirements%20Document.pdf">http://ibttta.org/sites/default/files/documents/IOP/Final%20NIOP%20Requirements%20Document.pdf</a> ).	Functional			Yes	Kapsch is an active participant in the NIOP process and complies with all requirements preparing the way for national interoperability.	D.2.3 Automatic Vehicle Identification (AVI) System
<b>5.3.2</b>	<b>Title-21</b>						
5.3.2.1	The System shall be fully compliant with Title-21 of the California Code of Regulations which establishes the technical requirements for ETC readers and transponders used in the State of California. The TSI shall supply AVI equipment in compliance with this regulation and shall ensure that the System implementation provides AVI compatibility with other California Toll Operators.	Functional			Yes	The proposed toll system includes Sirit AVI readers.	D.2.3.1 Title-21
5.3.2.2	The System shall support both traditional Title-21 and 6C California transponders which will be issued as switchable and non-switchable types. Switchable transponders are used to indicate the number of people in the vehicle at the time of the toll. Documentation related to the implementation of the various protocols will be published by CALTRANS and CTOC.	Functional			Yes	The proposed toll system includes Sirit AVI readers.	D.2.3.1 Title-21
5.3.2.3	The System shall support an additional protocol currently contemplated by the IBTTA National Interoperability initiative in support of the Federally mandated toll interoperability in accordance with MAP-21. These protocols have been identified as 6C, SeGo, and TDM.	Functional			Yes	Kapsch is an active participant in the NIOP process and complies with all requirements preparing the way for national interoperability.	D.2.3.1 Title-21
5.3.2.4	The TSI shall ensure that the antennas operating on the new System during Phase 4 and Phase 5 do not interfere with the operation of the current system.	Functional			Yes	Kapsch will provide input into civil design to preclude interference from the old toll system.	D.2.3.1 Title-21
5.3.2.5	The TSI shall address, in the Proposal, ways to ensure that the Title-21 protocol requirement that transponders stop communicating with the acknowledging reader for 10 seconds following the acknowledge command, will not prevent full testing of the new System with live traffic during Phase 4 and Phase 5.	Proposal	Accepted				D.2.3.1 Title-21
<b>5.4</b>	<b>AUTOMATIC VEHICLE CLASSIFICATION (AVC) SYSTEM</b>						
<b>5.4.1</b>	<b>Primary Automatic Vehicle Classification (AVC) Requirements</b>						
5.4.1.1	The TSI shall implement a primary Automatic Vehicle Classification (AVC) system which classifies vehicles by axle in accordance with the current classification structure in place at the Golden Gate Bridge.	Functional			Yes	The primary AVC uses Idris in-pavement loop sets including the axle counting dipole loops.	D.2.4 Automatic Vehicle Classification (AVC) System
5.4.1.2	The AVC system shall determine the vehicle axle count using sensors, not by inference or estimation. Treadles and treadle strips are not acceptable.	Functional					
5.4.1.3	The AVC system shall detect and report the following vehicle classes: <ul style="list-style-type: none"> <li>• 2 axle</li> <li>• 3 axle</li> <li>• 4 axle</li> <li>• 5 axle</li> <li>• 6 axle</li> <li>• 7+ axle</li> </ul>	Functional			Yes	The primary AVC uses Idris in-pavement loop sets including the axle counting dipole loops. The secondary AVC uses nVDC sensors which count wheels at the end of axles.	D.2.4 Automatic Vehicle Classification (AVC) System
5.4.1.4	The AVC system shall detect and classify all vehicles passing through the Toll Zone at all speeds from stop-and-go, bumper-to-bumper traffic, to 100 miles per hour, while meeting the performance requirements set forth within this	Functional			Yes	The primary AVC uses Idris in-pavement loop sets including the axle counting dipole loops. The secondary AVC uses nVDC sensors which count wheels at the end of axles.	D.2.4 Automatic Vehicle

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.4.1.5	The AVC shall properly identify and separate vehicles traveling side-by-side, straddling lanes, following closely together, sharing part of the same lane, or changing lanes.	Functional			Yes	The primary AVC uses Idris in-pavement loop sets including the axle counting dipole loops. The secondary AVC uses nVDC sensors which count wheels at the end of axles.	D.2.4 Automatic Vehicle Classification (AVC) System
5.4.1.6	The AVC shall operate in all weather conditions present at the proposed location, 24 hours a day, seven days a week without degradation while meeting the performance requirements set forth in this RFP.	Functional			Yes	The primary AVC uses Idris in-pavement loop sets including the axle counting dipole loops. The secondary AVC uses nVDC sensors which count wheels at the end of axles.	D.2.4 Automatic Vehicle Classification (AVC) System
5.4.1.7	The AVC system shall monitor and log the state of its various components and report any equipment failures or degradation to the Zone Controller.	Functional			Yes	This is part of Kapsch standard lane solution	D.2.4 Automatic Vehicle Classification (AVC) System
<b>5.4.2</b>	<b>Secondary AVC Requirements</b>						
5.4.2.1	The TSI shall provide a secondary method of detecting and classifying vehicles in the event the primary AVC system fails.	Functional			Yes	The secondary AVC uses nVDC sensors which count wheels at the end of axles.	D.2.4 Automatic Vehicle Classification (AVC) System
5.4.2.2	The Secondary AVC shall adhere to all the requirements of the primary AVC as detailed in Section 5.4.1, except that the secondary AVC can infer the axle count from the profile.	Functional			Yes	The secondary AVC uses nVDC sensors which count wheels at the end of axles.	D.2.4 Automatic Vehicle Classification (AVC) System
5.4.2.3	Failover from the primary AVC to the secondary AVC, and back, shall be automatic.	Functional			Yes	Kapsch exceeds redundancy requirements by providing an active Zone Controller redundancy configuration and letting the Host determine if automatic fail-over is appropriate, in which case it uses the message stream from the redundant unit. It will be configured to "fail-over" automatically.	D.2.4 Automatic Vehicle Classification (AVC) System
5.4.2.4	Failover from the primary AVC to the secondary AVC or restoration of the primary AVC shall generate an Alert.	Functional			Yes	Kapsch exceeds redundancy requirements by providing an active Zone Controller redundancy configuration and letting the Host determine if automatic fail-over is appropriate, in which case it uses the message stream from the redundant unit. It will be configured generate an Alert when "fail-over" occurs.	D.2.4 Automatic Vehicle Classification (AVC) System
<b>5.4.3</b>	<b>Speed Detection</b>						
5.4.3.1	The Lane shall detect the speed of all vehicles passing through the Toll Zone and report the speed to the Host as part of the Transaction.	Functional			Yes	The primary AVC uses Idris in-pavement loop sets including the axle counting dipole loops. The secondary AVC uses nVDC sensors which count wheels at the end of axles.	D.2.4 Automatic Vehicle Classification (AVC) System
<b>5.5</b>	<b>IMAGE CAPTURE SYSTEM (ICS)</b>						
<b>5.5.1</b>	<b>Image Capture System Requirements</b>						
5.5.1.1	The Lane shall incorporate an ICS which captures front and rear images of all vehicles traversing the Toll Zone and associates them with Transactions.	Functional					
5.5.1.2	Front and rear images shall provide sufficient resolution and field of view to encompass the typical license plate mounting location on all vehicles traversing the Toll Zone.	Functional			Yes	The ICS includes front and rear Kapsch VRX Near IR cameras on each travel lane. The Near IR flash is not visible by roadway users.	D.2.5 Image Capture System (ICS)

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.5.1.3	The ICS shall capture at least one front and one rear image of every vehicle traveling through the Toll Zone. This shall include vehicles with valid transponders.	Functional			Yes	The ICS includes front and rear Kapsch VRX Near IR cameras on each travel lane. The Near IR flash is not visible by roadway users.	D.2.5 Image Capture System (ICS)
5.5.1.4	The ICS shall provide full coverage on and between all travel lanes in the Toll Zone.	Functional			Yes	The ICS includes front and rear Kapsch VRX Near IR cameras on each travel lane. The Near IR flash is not visible by roadway users.	D.2.5 Image Capture System (ICS)
5.5.1.5	The ICS shall capture images of all vehicles passing through the Toll Zone at all speeds from stop-and-go, bumper-to-bumper traffic, to 100 miles per hour, while meeting the performance requirements set forth within this RFP.	Functional			Yes	ICS triggers are from several sources, including nVDC. nVDC provides exemplary trigger results in any weather conditions for vehicles in any lateral position at speeds from stop&go to 100	D.2.5 Image Capture System (ICS)
5.5.1.6	The ICS cameras shall be installed and adjusted to optimize the capture of useable license plate images.	Functional			Yes	The ICS includes front and rear Kapsch VRX Near IR cameras on each travel lane. The Near IR flash is not visible by roadway users.	D.2.5 Image Capture System (ICS)
5.5.1.7	The ICS shall operate in all weather conditions present at the proposed location and 24 hours a day, seven days a week without degradation while meeting the ICS performance requirements set forth in this RFP.	Functional			Yes	ICS triggers are from several sources, including nVDC. nVDC provides exemplary trigger results in any weather conditions for vehicles in any lateral position at speeds from stop&go to 100 mph.	D.2.5 Image Capture System (ICS)
5.5.1.8	The ICS shall provide adequate supplemental lighting to ensure visible and legible license plates in both rear and front images in all lighting conditions.	Functional			Yes	ICS triggers are from several sources, including nVDC. nVDC provides exemplary trigger results in any weather conditions for vehicles in any lateral position at speeds from stop&go to 100 mph.	D.2.5 Image Capture System (ICS)
5.5.1.9	ICS illumination shall not present a distraction or obstruct the visibility of drivers in the Toll Zone.	Functional			Yes	The ICS includes front and rear Kapsch VRX Near IR cameras on each travel lane. The Near IR flash is not visible by roadway users.	D.2.5 Image Capture System (ICS)
5.5.1.10	The ICS shall be synchronized and exchange data with the Zone Controller to ensure that vehicle images are properly associated with the correct vehicle and its transaction data.	Functional			Yes	This is part of Kapsch standard toll solution.	D.2.5 Image Capture System (ICS)
5.5.1.11	Images shall be stored in JPEG format with a configurable compression/quality factor.	Functional			Yes	This is part of Kapsch standard toll solution.	D.2.5 Image Capture System (ICS)
5.5.1.12	Uniquely identifying Transaction data, including but not limited to Lane Transaction ID, Transaction date/time, Lane number, and front/rear indication, shall be encoded in the header or comment block of the image.	Functional			Yes	This is part of Kapsch standard toll solution.	D.2.5 Image Capture System (ICS)
5.5.1.13	The quantity, sizes and compression factor of images shall take into consideration the need for human review as well as potential network bandwidth restrictions.	Functional			Yes	This is part of Kapsch standard toll solution.	D.2.5 Image Capture System (ICS)
5.5.1.14	The ICS shall employ a store-and-forward mechanism and retain images for a minimum of 60 days after transmission to the Host.	Functional			Yes		D.2.5 Image Capture System (ICS)
5.5.1.15	The ICS shall automatically purge retained images when the amount of free disk space drops below a configurable threshold, but not less than 60 days after transmission to the Host.	Functional			Yes	This is configurable as part of Kapsch standard toll solution.	D.2.5 Image Capture System (ICS)
5.5.1.16	The ICS shall monitor and log the state of its various components, including but not limited to processors, available disk space, light sensors, cameras, network devices, and illuminators, and report any equipment failures or degradation to the Zone Controller as Alarms.	Functional			Yes	This will be done as part of the ROMS within the Zone Controller software	D.2.5 Image Capture System (ICS)
5.5.1.17	The TSI shall provide an ICS that shall capture and store license plate images if both Zone Controllers become inoperable.	Functional			Yes	The ICS includes front and rear Kapsch VRX Near IR cameras on each travel lane. The VRX cameras can store license plate images if the zone controllers become inoperable.	D.2.5 Image Capture System (ICS)

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.5.1.18	The capture (trigger) and storage of license plate images shall not be solely dependent on the Zone controllers.	Functional			Yes	ICS triggers come from several sources including nVDC and Idris loops. The Kapsch VRX cameras can also be configured to rely upon an internal self-trigger if an external trigger does not arrive.	D.2.5 Image Capture System (ICS)
5.5.1.19	The Proposer is advised that California will require that dealers provide temporary license plates for all vehicles leaving the dealership starting January 2019. These plates may be made of paper and may or may not be retroreflective.	Informational	Accepted				D.2.5 Image Capture System (ICS)
5.5.1.20	The TSI shall provide for the capture and performing ALPR on temporary license plates in their design at the same (or better) performance levels as permanent license plates.	Functional					
5.5.1.21	Useable license plate images are those that had no restrictions to their capture (e.g. obstructed by another vehicle) and are human readable	Informational	Accepted			Definition of "usable license plate images" considered to also exclude plates that have restrictions to their capture because they are not mounted in the legally required position; are covered by dirt or snow rendering the jurisdiction, plate characters or plate type unreadable; are willfully obstructed by Users by a film or other means; or, are damaged, bent or broken rendering the jurisdiction, plate characters or plate type unreadable.	D.2.5 Image Capture System (ICS)
<b>5.5.2</b>	<b>Automatic License Plate Recognition (ALPR)</b>						
5.5.2.1	The System shall incorporate ALPR for the extraction of license plate information (issuing jurisdiction, plate numbers/letters and plate type) from captured images and associate these results with Transactions (Plate Data). Plate Data shall include stacked characters and any required plate character prefixes or suffixes.	Functional			Yes	The ALPR solution will use two OCRs, one trained for the local distribution of plates by jurisdiction, combined using Kapsch FUSION engine.	D.2.5 Image Capture System (ICS)
5.5.2.2	The ALPR can be a component of the Lane or the Host.	Functional			Yes		D.2.5 Image Capture System (ICS)
5.5.2.3	The ALPR shall assign to each license plate/vehicle image captured a Confidence Level. The Confidence Level is a figure of merit for each image and the various elements comprising Plate Data representing the likelihood that the Plate Data produced by the ALPR is correct. The Confidence Level shall be a monotonically increasing number wherein the highest level indicates 100% likelihood that the Plate Data is correct.	Functional			Yes		D.2.5 Image Capture System (ICS)
5.5.2.4	The ALPR shall correctly process vertically, horizontally and diagonally stacked characters.	Functional			Yes	The ALPR solution will use two OCRs, one trained for the local distribution of plates by jurisdiction, combined using Kapsch FUSION engine.	D.2.5 Image Capture System (ICS)
5.5.2.5	The ALPR results shall include the plate characters, issuing jurisdiction and plate type for both the front and rear of the vehicle.	Functional			Yes	The OCR solution will use images from both front and rear cameras. The ALPR solution will use two OCRs, one trained for the local distribution of plates by jurisdiction, combined using Kapsch FUSION engine.	D.2.5 Image Capture System (ICS)
5.5.2.6	The ALPR results shall include separate Confidence Levels for the front and rear license plates.	Functional			Yes	The OCR solution will use images from both front and rear cameras. The ALPR solution will use two OCRs, one trained for the local distribution of plates by jurisdiction, combined using Kapsch FUSION engine.	D.2.5 Image Capture System (ICS)
5.5.2.7	The System shall provide a utility to review the ALPR results of stored images for quality assurance and maintenance purposes.	Functional			Yes	Kapsch will provide a free limited feature version of Kapsch Graphicworks	D.2.5 Image Capture System (ICS)
<b>5.6</b>	<b>DIGITAL VIDEO AUDIT SYSTEM (DVAS) CAMERAS</b>						
<b>5.6.1</b>	<b>DVAS Camera Requirements</b>						



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
5.6.1.1	The System shall provide one DVAS camera and associated illumination per travel lane.	Functional					
5.6.1.2	The DVAS cameras shall have a resolution of no less than 720p (1280 by 720 pixels).	Functional			Yes	This is part of Kapsch standard toll solution	D.2.6 Digital Video Audit System (DVAS) Cameras
5.6.1.3	DVAS illumination shall not pose a distraction or hazard to drivers approaching or in the Toll Zone.	Functional			Yes	This is part of Kapsch standard toll solution	D.2.6 Digital Video Audit System (DVAS) Cameras
5.6.1.4	DVAS cameras shall capture clear and usable video regardless of lighting conditions present at the Toll Zone, and shall function as required in all weather conditions.	Functional			Yes	This is part of Kapsch standard toll solution	D.2.6 Digital Video Audit System (DVAS) Cameras
5.6.1.5	provide a view of the vehicle in the Lane sufficient to determine the vehicle classification.	Functional			Yes	This is part of Kapsch standard toll solution	D.2.6 Digital Video Audit System (DVAS) Cameras
5.6.1.6	The District has no preference regarding color or black and white DVAS cameras.	Informational	Accepted				D.2.6 Digital Video Audit System (DVAS) Cameras
<b>5.7</b>	<b>BEACON</b>						
<b>5.7.1</b>	<b>Beacon Requirements</b>						
5.7.1.1	The Lane shall incorporate an "Occupancy Beacon" located on the Gantry above each travel lane.	Functional			Yes		D.2.7 Beacon
5.7.1.2	The Occupancy Beacon shall illuminate when a valid transponder is detected during carpool hours with a switch setting set to a position indicating HOV2 or HOV3, as determined by the District business rules.	Functional					
5.7.1.3	The Occupancy Beacon shall utilize LED illumination and shall operate in all weather conditions normally found at the Golden Gate Bridge.	Functional			Yes		D.2.7 Beacon
5.7.1.4	When illuminated, the Occupancy Beacon shall be visible downstream from the Toll Zone for a distance of 100 feet, day and night, at horizontal angles of 180 degrees from the direction of traffic.	Functional			Yes		D.2.7 Beacon
5.7.1.5	The light from the Occupancy Beacon shall not pose a distraction or hazard to drivers approaching or in the Toll Zone.	Functional			Yes		D.2.7 Beacon
5.7.1.6	The color and intensity of the Beacon shall be determined in the Design Phase.	Functional			Yes		D.2.7 Beacon
<b>6</b>	<b>HOST REQUIREMENTS</b>						
<b>6.1</b>	<b>GENERAL HOST REQUIREMENTS</b>						
<b>6.1.1</b>	<b>Basic Host Requirements</b>						
6.1.1.1	The TSI shall furnish and install a fully functional Host.	Functional			Yes	This is part of Kapsch standard toll solution	D.3.1 General Host Requirements
6.1.1.2	The Host shall allow for remote and on-site monitoring and control of all System activity.	Functional			Yes	This is part of Kapsch standard toll solution	D.3.1 General Host Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.1.1.3	The Host shall accept Transactions, images, Alerts and any other Lane messages from the Lane and store them in its database.	Functional			Yes	This is part of Kapsch standard toll solution	D.3.1 General Host Requirements
6.1.1.4	The Host shall meet the storage requirements specified in Section 8	Functional			Yes		D.3.1 General Host Requirements
6.1.1.5	The Host shall support a minimum of twenty (20) simultaneous users accessing screens and/or running reports.	Functional					
6.1.1.6	The Host shall interface with the RCSC in full compliance with the RCSC ICD (See Appendix D).	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.1 General Host Requirements
6.1.1.7	All Host functions shall be available via interactive screens.	Functional			Yes	This is part of Kapsch standard toll solution	D.3.1 General Host Requirements
<b>6.2</b>	<b>HOST HARDWARE</b>						
<b>6.2.1</b>	<b>Host Computer Requirements</b>						
6.2.1.1	The Host shall be furnished with primary and secondary computer systems and associated cabinet(s), one at each of two locations designated by the District.	Functional					
6.2.1.2	Each Host shall consist of industry standard, commercial-off-the-shelf servers, sized to satisfy the requirements defined herein.	Functional			Yes	This is part of Kapsch standard toll solution	D.3.2 Host Hardware
6.2.1.3	Each Host shall have sufficient hard disk space to provide storage for the life of the System while maintaining at least 25% free space.	Functional			Yes	Assuming "life of the System" means 10 years per Requirement 3.2.2.1. A question has been raised with the customer.	D.3.2 Host Hardware
6.2.1.4	Each Host shall utilize less than 25% CPU capacity during peak load.	Functional					
6.2.1.5	Host equipment shall include TCP/IP connectivity and shall support SNMP monitoring and configuration.	Functional			Yes	This is part of Kapsch standard toll solution	D.3.2 Host Hardware
<b>6.3</b>	<b>HOST SOFTWARE</b>						
<b>6.3.1</b>	<b>Host Database Management Requirements</b>						
6.3.1.1	The System shall be furnished with a highly reliable and secure relational database management system (DBMS) for the storage of all data, as applicable, for the data retention periods specified herein.	Functional			Yes		D.3.3.1 Host Database Management Requirements
6.3.1.2	The DBMS, and the System database design, shall be flexible and scalable to enable possible future expansion.	Functional			Yes	The proposed solution uses Oracle databases. These support scalability and future expansion.	D.3.3.1 Host Database Management Requirements
6.3.1.3	The DBMS shall incorporate technology that minimizes System down time.	Functional			Yes	Basic replication from the primary Host database to the secondary Host database is used to minimize system downtime.	D.3.3.1 Host Database Management Requirements
6.3.1.4	The DBMS shall provide run-time control limits to manage large queries or down-loads.	Functional			Yes		D.3.3.1 Host Database Management Requirements
6.3.1.5	The DBMS shall be configured, and the System database designed, to enforce referential integrity wherever possible using foreign keys, field-level NULL and value constraints, triggers, or similar devices.	Functional			Yes		D.3.3.1 Host Database Management Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.3.1.6	The DBMS shall allow Structured Query Language (SQL) access and Open Database Connectivity (ODBC) to authorized District staff.	Functional			Yes		D.3.3.1 Host Database Management Requirements
6.3.1.7	All System data elements shall be defined within the DBMS in metadata tables that are accessible via SQL queries.	Functional			Yes		D.3.3.1 Host Database Management Requirements
6.3.1.8	The DBMS and Host software shall be configured to generate all System reports without impacting transaction processing performance.	Functional			Yes	This is accomplished by using a separate data on a separate Data Warehouse server to handle the reports	D.3.3.1 Host Database Management Requirements
6.3.1.9	Host application codes such as transaction types, status codes, and multi-value flags included in database field definitions shall be coded as human readable values or as foreign keys to lookup tables that contain human readable values, to facilitate query and report development.	Functional			Yes	This is part of the Kapsch standard host.	D.3.3.1 Host Database Management Requirements
<b>6.3.2</b>	<b>Host Database Requirements</b>						
6.3.2.1	The Host shall generate reports and ad hoc query results from the Host database where the data is current within five (5) minutes of its creation in the System	Functional			Yes	The Kapsch standard host includes Oracle functionality that permits these ad hoc queries.	D.3.3.2 Host Database Requirements
6.3.2.2	The Host database shall contain record or message level data for the RCSC External Interface.	Functional			Yes	This is part of the Kapsch standard host.	D.3.3.2 Host Database Requirements
6.3.2.3	The Host database shall provide the capability for users to export table data as well as export the entire Host database.	Functional			Yes	The proposed solution uses Oracle databases. These support scalability and future expansion.	D.3.3.2 Host Database Requirements
6.3.2.4	The Host database shall be configured to optimize report generation and ad hoc user generated queries.	Functional			Yes	The proposed solution uses Oracle databases. These support scalability and future expansion.	D.3.3.2 Host Database Requirements
6.3.2.5	All fields in the Host database shall be made available for ad hoc reporting.	Functional			Yes	This is part of the Kapsch standard host.	D.3.3.2 Host Database Requirements
6.3.2.6	De-normalized or pre-joined data objects shall be made available to ad hoc reporting users. These convenience tables or views on tables shall be defined during the System Design Phase.	Functional			Yes	The proposed solution uses Oracle databases. These support scalability and future expansion.	D.3.3.2 Host Database Requirements
6.3.2.7	All tables, fields, views and other database objects names made available for ad hoc reporting shall be defined and fully described in a System data dictionary.	Functional			Yes	The proposed solution uses Oracle databases. These support scalability and future expansion.	D.3.3.2 Host Database Requirements
6.3.2.8	The Host database shall support column level encryption.	Functional			Yes	This is part of the Kapsch standard host.	D.3.3.2 Host Database Requirements
6.3.2.9	Transponder ID numbers and license plate numbers as stored in the Host database shall be encrypted at the District's option.	Functional			Yes	The proposed solution uses Oracle databases. These support scalability and future expansion.	D.3.3.2 Host Database Requirements
<b>6.3.3</b>	<b>Application Software Requirements</b>						
6.3.3.1	Host application software shall be developed using industry standard, high-level programming languages.	Functional			Yes		D.3.3.3 Application Software Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.3.3.2	Host application software shall utilize versions of language compilers, interpreters, build environments, version management tools, bug tracking tools, etc. that are stable and that can reasonably be expected to be fully supported by their manufacturers for at least five years into the future.	Functional			Yes	This is part of the Kapsch standard host.	D.3.3.3 Application Software Requirements
6.3.3.3	Host application operations and business rules shall be configurable as appropriate, to be determined in cooperation with the District during the System Design Phase.	Functional			Yes	This is part of the Kapsch standard host.	D.3.3.3 Application Software Requirements
6.3.3.4	Host configuration settings shall be stored in the Host database and be manageable from Host application screens as appropriate, to be determined in cooperation with the District during the System Design Phase.	Functional			Yes	This is supported by the Kapsch standard host.	D.3.3.3 Application Software Requirements
6.3.3.5	Host application software shall generate and maintain comprehensive, time stamped, human readable, machine parse-able logs of Transaction level activity, database updates, and user access.	Functional			Yes	As part of the standard Kapsch host, these items are human-readable and machine readable. However they are not bar-code readable unless addition NRE is performed.	D.3.3.3 Application Software Requirements
6.3.3.6	Host application software log entries for database updates shall include enough specific information that a maintenance technician with knowledge of the Host database could determine with confidence which table fields were updated, and to which values.	Functional			Yes		D.3.3.3 Application Software Requirements
6.3.3.7	Host application software shall support user access from commercial off the shelf personal computers, laptop computers, and tablets. Application access from cell phones is desired but not required.	Functional			Yes		D.3.3.3 Application Software Requirements
6.3.3.8	The Host application software shall support printing to commercial off the shelf office or personal printers.	Functional			Yes		D.3.3.3 Application Software Requirements
<b>6.3.4</b>	<b>Graphical User Interface</b>						
6.3.4.1	The Host application shall be browser based and shall support all current and two previous versions of Microsoft Internet Explorer, Chrome (both Windows and Android versions), and Safari (both OS X and iOS versions).	Functional					
6.3.4.2	The Host application shall make full use of the graphical user interface (GUI) functions provided by a browser to minimize the number of keystrokes required to interact with the System.	Functional			Yes		D.3.3.4 Graphical User Interface
6.3.4.3	The Host application shall require users to authenticate once per session and shall utilize a central authentication repository.	Functional			Yes		D.3.3.4 Graphical User Interface
6.3.4.4	The Host application shall enable users to open multiple GUI windows simultaneously. For example, a user could be viewing real-time Lane activity in one GUI window while simultaneously examining Transaction level data or associated reports in another GUI window.	Functional			Yes		D.3.3.4 Graphical User Interface
<b>6.4</b>	<b>TRANSACTION MANAGEMENT</b>						
<b>6.4.1</b>	<b>Lane Interface</b>						
6.4.1.1	The Host shall implement a robust interface to the Lane. This interface shall govern the reliable and timely exchange of all data from the Host to the Lane and for the receipt of all required data by the Host from the Lane.	Functional			Yes		D.3.4.1 Lane Interface

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.4.1.2	The TST shall fully document the interface between the Host and the Lane in a Host to Lane Interface Control Document (HLICD). The HLICD shall contain sufficient information on the contents of the interface and the methods/protocols of data transfer to allow others to develop to the interface if necessary.	Functional			Yes		D.3.4.1 Lane Interface
6.4.1.3	The TSI shall provide the District with full rights to utilize the HLICD as the District chooses.	Functional			No	Updated per Clarifications 02/27/2017: Kapsch confirms that it is acceptable for the District to share ICDs with additional parties such as third-party report developers or other operational consultants, so long as they abide by the NDA.	D.3.4.1 Lane Interface
6.4.1.4	The Host to Lane interface shall support the error free transmission of all required Lane data from the Host to the Lane. This data shall include, but not be limited to: • Lane configuration data • Lane control messages • Transponder Status data • Carpool Hour data	Functional			Yes		D.3.4.1 Lane Interface
6.4.1.5	The Host to Lane interface shall support the error free transmission of all required Lane data from the Lane to the Host. This data shall include, but not be limited to: • Transactions • Images • DVAS Video • Status • Alerts	Functional			Yes		D.3.4.1 Lane Interface
6.4.1.6	The Host to Lane interface shall use messaging and file transfer protocols that guarantee delivery of data.	Functional			Yes	The Kapsch standard toll solution uses guaranteed delivery protocols for data transfers between servers.	D.3.4.1 Lane Interface
6.4.1.7	The Host shall generate appropriate Alerts whenever there is an indication of data loss or failure of normal operations.	Functional			Yes	The Kapsch standard toll solution includes this as part of the ROMS capability	D.3.4.1 Lane Interface
6.4.1.8	The Host shall employ appropriate rules and filters to detect duplicate data received from the Lane. Such duplicate data shall be stored separately from normal Lane data for further research and analysis by users.	Functional			Yes		D.3.4.1 Lane Interface
<b>6.4.2</b>	<b>Toll Transaction Processing</b>						
6.4.2.1	The Host shall receive sequentially numbered Transactions of each type from the Lane.	Functional			Yes	The Host adds a new host-level transaction ID prior to transfer to the CSC so that any gaps in sequence numbering can be detected. The host checks for gaps in the ZC-generated transaction ID when receiving transactions from the lane.	D.3.4.2 Toll Transaction Processing
6.4.2.2	The Host shall determine if the Lane generated Toll Transaction sub-type (AVI or IBT) is out of date and shall modify the sub-type based on the most recent Transponder Status received from the RCSC.	Functional			Yes		D.3.4.2 Toll Transaction Processing
6.4.2.3	For each Toll Transaction, the Host shall determine the fare from a stored table that maps the fare to Vehicle Class and business rules stored in the database for Carpool and AVI and Toll Transaction sub-type. The fare shall be included in the Toll Transaction that is sent to the RCSC.	Functional			Yes		D.3.4.2 Toll Transaction Processing
6.4.2.4	The Host shall generate Transaction numbers for each Toll Transaction that are consistent with the requirements of the RCSC ICD.	Functional			Yes	Kapsch standard Host software will be configured to specifically address RCSC ICD requirements	D.3.4.2 Toll Transaction Processing

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.4.2.5	The Host shall ensure that the Transaction numbers generated for the new System do not conflict or overlap with Transactions numbers from the current system.	Functional			Yes	Kapsch standard Host software will be configured to specifically address RCSC ICD requirements	D.3.4.2 Toll Transaction Processing
6.4.2.6	The Host shall use the Toll Transaction Entry Time as the date and time of record for the Toll Transaction to be sent to the RCSC and for Transaction research purposes.	Functional			Yes		D.3.4.2 Toll Transaction Processing
6.4.2.7	The Host shall include an Image File using the images received from the Lane for each IBT Toll Transaction sent using the RCSC ICD .	Functional					
6.4.2.8	The Host shall include the corresponding ALPR data consistent with the RCSC ICD.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.4.2 Toll Transaction Processing
6.4.2.9	The Host shall generate a Violation Data File (VDF) for each IBT Toll Transaction consistent with RCSC ICD.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.4.2 Toll Transaction Processing
<b>6.4.3</b>	<b>Buffered and Isolated Transaction Processing</b>						
6.4.3.1	Host processing rules and/or procedures shall ensure that any missing tolls are sent to the RCSC and any duplicate tolls are dismissed and not sent to the RCSC. To accomplish this, these anomalous Transactions shall be treated differently depending on the failure mode.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.4.3 Buffered And Isolated Transaction Processing
6.4.3.2	The Host shall include procedures, some of which may be manual, for ensuring that Isolated Transponder, Buffered Transponder and Buffered Image Transactions are processed such that there is no loss of revenue to the District and no duplicate charges to customers.	Functional			Yes	The Kapsch standard Host supports this, as described in its operating manual.	D.3.4.3 Buffered And Isolated Transaction Processing
6.4.3.3	The TSI shall develop processes and/or procedures, some of which may be manual, for the proper processing of these anomalous Transactions.	Functional			Yes	The Kapsch standard Host supports this, as described in its operating manual.	D.3.4.3 Buffered And Isolated Transaction Processing
6.4.3.4	The Host shall convert Isolated Transponder, Buffered Transponder and Buffered Image Transactions that are to be sent to the RCSC into Toll Transactions.	Functional			Yes	The Kapsch standard Host supports this, as described in its operating manual.	D.3.4.3 Buffered And Isolated Transaction Processing
6.4.3.5	The Host shall retain the previous Type of these converted Toll Transactions.	Functional			Yes	The Kapsch standard Host supports this, as described in its operating manual.	D.3.4.3 Buffered And Isolated Transaction Processing
<b>6.4.4</b>	<b>RCSC Interface</b>						
6.4.4.1	The Host shall format and group all AVI Toll Transactions and all IBT Toll Transactions into separate files for transmission to the RCSC at intervals consistent with District business rules and RCSC ICD requirements.	Functional			Yes	Kapsch standard Host software can be configured in this way.	D.3.4.4 Rsc Interface
6.4.4.2	The Host shall receive Transaction reconciliation files from the RCSC and update local Transaction records accordingly.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.4.4 Rsc Interface
6.4.4.3	The Host shall receive and process Transponder Status Files from the RCSC per the RCSC ICD.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.4.4 Rsc Interface

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.4.4.4	The Host shall track all RCSC file transfer activity and generate the appropriate Alerts files are not sent and accepted in either direction within the established time or fails reasonable checks for size and content.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.4.4 Rscsc Interface
<b>6.5</b>	<b>REPORTING</b>						
<b>6.5.1</b>	<b>General Reporting Requirements</b>						
6.5.1.1	The System shall be furnished with a robust and comprehensive, SQL-based reporting capability allowing multiple simultaneous users to generate reports as necessary.	Functional			Yes	It enables authorized users to create, store and share ad hoc report definitions using point-and-click query building or full SQL access. They can also create queries using any third-party SQL client tool supporting ODBC.	D.3.5.1 General Reporting Requirements
6.5.1.2	The System shall generate all reports without adversely impacting the normal operations of the System.	Functional			Yes	The proposed solution includes a separate reporting database on a dedicated Data Warehouse server	D.3.5.1 General Reporting Requirements
6.5.1.3	The System shall enable users to browse and generate reports on demand through a GUI.	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.4	Pre-defined reports shall allow users to specify various selection criteria and sort criteria, depending on the report, to be determined during the System Design Phase.	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.5	Pre-defined reports shall be displayed in a single consistent set of fonts and font sizes, and with consistent use of margins and white space.	Functional			Yes	Implemented during the design phase.	D.3.5.1 General Reporting Requirements
6.5.1.6	The System shall produce pre-defined reports that include a standard report header and/or footer that shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Report ID (a unique numeric or alphanumeric code identifier for the report)</li> <li>• Report name</li> <li>• Report group(s)</li> <li>• Selection criteria used to generate the report</li> <li>• Page number in the format "Page X of Y"</li> <li>• ID of the user executing the report</li> <li>• Date/time the report was generated</li> </ul>	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.7	The System shall enable users to configure pre-defined or ad hoc reports to be automatically generated on a one-time or periodic schedule.	Functional			Yes	Kapsch standard Host includes Oracle functionality which permits ad hoc reports to be generated in this manner.	D.3.5.1 General Reporting Requirements
6.5.1.8	The System shall ensure that all selection criteria normally applicable to a report shall be available when scheduling automatic generation of a pre-defined or ad hoc report.	Functional			Yes	Kapsch standard Host includes Oracle functionality which permits ad hoc reports to be generated in this manner.	D.3.5.1 General Reporting Requirements
6.5.1.9	The System shall enable users to schedule the automatic execution and delivery of pre-defined and ad hoc reports to email addresses, shared drives or Uniform Naming Convention (UNC) paths, or directly to a user selected printer.	Functional			Yes	Implemented during the design phase.	D.3.5.1 General Reporting Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.5.1.10	The System shall schedule pre-defined or ad hoc reports to report on time periods relative to report generation time, as appropriate to each report, for example: <ul style="list-style-type: none"> <li>• Last month</li> <li>• Yesterday</li> <li>• This month</li> <li>• Year to date</li> <li>• Last week</li> </ul>	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.11	The System shall display reports on screen and enable users to generate pre-defined or ad hoc reports to formats that include Microsoft Excel, PDF, CSV and Hyper Text Markup Language (HTML).	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.12	The System shall enable users to generate any pre-defined report into a data-only format without page breaks, headers, footers, empty cells, group totals, grand totals, footnotes, or sub-reports; without labels and values that span multiple rows or columns; and that can be easily imported into and manipulated within Microsoft Excel, Microsoft Access, or a text editor.	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.13	Pre-defined reports shall include navigational links to related reports or screens as appropriate, to be determined during the System Design Phase.	Functional			Yes	Implemented during the design phase.	D.3.5.1 General Reporting Requirements
6.5.1.14	Pre-defined reports shall be reconcilable and cross-referential with one another and with related informational screen displays, through the consistent use of report names, terms, value calculations, selection criteria labels, and data labels.	Functional			Yes	Implemented during the design phase.	D.3.5.1 General Reporting Requirements
6.5.1.15	The System shall include footnotes in pre-defined reports that alert users to the meanings of non-standard terms, the presence of unusual report-specific data filters, and how value calculations are performed.	Functional			Yes	Implemented during the design phase.	D.3.5.1 General Reporting Requirements
6.5.1.16	The System shall enable users to create, install, configure, and incorporate new ad hoc reports into the System, without requiring software changes.	Functional					
6.5.1.17	The System shall be provided with the appropriate tools to allow users to create new ad hoc reports.	Functional			Yes	Kapsch standard Host includes Oracle functionality which permits ad hoc reports to be generated in this manner.	D.3.5.1 General Reporting Requirements
6.5.1.18	The System shall provide access to users to the pre-defined Reports definition files allowing them to utilize and/or copy as necessary to create new ad hoc reports.	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.19	The System shall be furnished and configured with a separate reporting database.	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.20	Ad hoc reports shall be generated from the reporting database.	Functional			Yes		D.3.5.1 General Reporting Requirements



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.5.1.21	The reporting database shall be updated no less frequently than daily providing for reports to be run for any period up-to and including the previous day.	Functional			Yes	The solution includes a separate reporting database on a dedicated Data Warehouse server	D.3.5.1 General Reporting Requirements
6.5.1.22	The data contained in the reporting database shall include all data elements used in the operational database so as not to restrict the types of reports that can be generated.	Functional			Yes	Kapsch standard Host includes Oracle functionality which permits ad hoc reports to be generated in this manner.	D.3.5.1 General Reporting Requirements
6.5.1.23	The reporting database shall provide its own set of database indexes optimized for reporting purposes.	Functional			Yes		D.3.5.1 General Reporting Requirements
6.5.1.24	The reporting system shall allow all predefined reports to be run by weekend or weekday if appropriate to the report.	Functional			Yes	Implemented during the design phase.	D.3.5.1 General Reporting Requirements
<b>6.5.2</b>	<b>Pre-Defined Reports</b>						
6.5.2.1	The System shall provide a Southbound Traffic Counts Report. This report shall contain hourly traffic and traffic percentage by lane, and by roadside payment type, for the selected date(s).	Functional			Yes	Implemented during the design phase.	D.3.5.2 Pre-Defined Reports
6.5.2.2	The System shall provide a Monthly Traffic by Day Report. This report shall contain daily traffic and traffic percentage, by roadside payment type, for the selected month.	Functional			Yes	Implemented during the design phase.	D.3.5.2 Pre-Defined Reports
6.5.2.3	The System shall provide a Two Year Traffic Comparison Report. This report shall contain total daily traffic for selected month and year, and for selected month of previous year, aligned by weekday.	Functional			Yes	Implemented during the design phase.	D.3.5.2 Pre-Defined Reports
6.5.2.4	The System shall provide a Revenue by Transaction Date Report. This report shall contain daily accounting of all traffic by payment method reported by the RCSC, including RCSC interim transactions and transactions not sent to the RCSC.	Functional					
6.5.2.5	The System shall provide a Plaza to CSC ETC File Reconciliation Report. This report shall contain RCSC file exchange details of REQ files for selected days, including their associated RES files and ACK files.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.5.2 Pre-Defined Reports
6.5.2.6	The System shall provide a Plaza to CSC IBT File Reconciliation Report. This report shall contain RCSC file exchange details of VIO files for selected days, including their associated VRES files and ACKs.	Functional			Yes	The TSI will update, reconfigure and test current interface software to match the District's specific RCSC interface requirements.	D.3.5.2 Pre-Defined Reports
6.5.2.7	The System shall provide a Discount, Non-Revenue and Carpool Report. This report shall contain daily discount traffic totals, reported by the RCSC, for the selected month.	Functional			Yes	Implemented during the design phase.	D.3.5.2 Pre-Defined Reports
6.5.2.8	The System shall provide a FasTrak Usage Report. This report shall contain quarterly averages of FasTrak, License Plate, and One Time Payments, as reported by the RCSC, for the most recent five fiscal years; shown for all days, for weekdays, for weekends and holidays, for weekday AM and PM peak periods.	Functional			Yes	Implemented during the design phase.	D.3.5.2 Pre-Defined Reports
6.5.2.9	The System shall provide performance reports that substantiate System accuracy and performance levels achieved. The details of these reports shall be finalized during the System Design Phase.	Functional			Yes	Kapsch standard Host solution includes several reports that provide a starting point. These include: Failure Summary, Down Time Analysis, Lane Performance	D.3.5.2 Pre-Defined Reports
<b>6.6</b>	<b>MAINTENANCE MANAGEMENT</b>						
<b>6.6.1</b>	<b>General Maintenance Management Requirements</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.6.1.1	The System shall record and respond appropriately to all System Alerts.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.1.2	The System shall support configurable responses based on Alert type or Alert contents.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.1.3	The System shall provide appropriate screens for managing Alerts and associated work orders. The process and screens shall be finalized during the System Design Phase.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
<b>6.6.2</b>	<b>Alerts</b>						
6.6.2.1	The TSI shall indicate in the proposal the Alerts that will be automatically generated by the System. These will form the basis of the list of Alerts during System Design.	Proposal					
6.6.2.2	All Alerts shall be automatically sent to a distribution list maintained on the Host.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.3	All Alerts shall require acknowledgement by the TSI within the required response time.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.4	Response time for all Alerts shall be tracked in the System.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.5	Repair time for all Alerts shall be tracked by the System.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.6	A failure shall produce one and only one Alert.	Functional			Yes	Kapsch ROMS will be configured to do this.	D.3.6 Maintenance Management
6.6.2.7	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the size of a Transponder Status File. The Transponder Status File shall not be transferred to the Lane or used for any other processing until the Alert is manually resolved.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.8	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the number of daily Toll Transactions.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.9	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the number of daily AVI Toll Transactions.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.10	The System shall detect and generate an Alert for an increase or decrease over a user configurable percent in the number of daily IBT Toll transactions.	Functional			Yes	Provided in the Kapsch standard Host as part of its ROMS functionality.	D.3.6 Maintenance Management
6.6.2.11	<ul style="list-style-type: none"> <li>• No vehicles detected in a Lane in x minutes</li> <li>• No valid AVI detected in a Lane in x minutes</li> <li>• No images captured in a Lane in x minutes</li> <li>• Loss of communication to any component in the System.</li> <li>• Loss of communication to the RCSC</li> <li>• Failure of any component in the System</li> <li>• Failed or Incomplete processing of any file or data in the System</li> <li>• Failure of any reasonableness checks</li> <li>• Any overlap or gap in Transaction Numbers</li> <li>• Any Zone Controller, Host, or storage system reaching 90% of capacity</li> </ul>	Functional			Yes	This is part of Kapsch standard solution	D.3.6 Maintenance Management

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
<b>6.7</b>	<b>DIGITAL VIDEO AUDIT SYSTEM</b>						
<b>6.7.1</b>	<b>Host DVAS Requirements</b>						
6.7.1.1	The TSI shall furnish a Digital Video Audit System (DVAS) that shall be used to capture and store video of Lane activity and associated Transaction and	Functional			Yes	This is part of Kapsch standard solution	D.3.7 Digital Video Audit
6.7.1.2	The DVAS shall consist of one or more industrial grade digital video recorders (DVR).	Functional			Yes	The standard soluiton implements a DVR using IBM servers/storage and ZoneMinder software that Kapsch has previously used in industrial environments.	D.3.7 Digital Video Audit System
6.7.1.3	The DVAS shall record at a frame rate of 30 frames per second per camera.	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.4	The DVAS shall allow the user to adjust the playback speed.	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.5	The DVAS shall provide for real-time viewing of video allowing the user to freeze and resume video playback.	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.6	The DVAS shall display Transaction data that is synchronized with the video as it is being reviewed. The content of the Transaction data shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Lane ID</li> <li>• Transaction ID</li> <li>• Transaction Date/Time</li> <li>• AVC Class</li> <li>• ALPR numbers and confidence levels (if any)</li> </ul>	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.7	If a Transponder is detected in a vehicle, the DVAS shall display Transponder data in addition to the Transaction data. Transponder data shall include but not be limited to: <ul style="list-style-type: none"> <li>• Transponder Protocol</li> <li>• Transponder ID</li> <li>• HOV self-declaration status</li> </ul>	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.8	DVAS shall be searchable. Search parameters shall include a date/time range and allow the user to specify additional parameters including but not limited to: <ul style="list-style-type: none"> <li>• Lane ID</li> <li>• Transaction ID</li> <li>• Plate Data</li> <li>• AVC Class</li> <li>• Transponder Protocol</li> <li>• Transponder ID</li> <li>• HOV self-declaration status</li> </ul>	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.9	The DVAS system shall accommodate one DVAS camera per toll lane and permit the user to select the camera of interest.	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.10	The DVAS shall store a minimum of 90 days of video per Lane.	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.11	The DVAS shall be accessible from any District workstation for both real time and stored video viewing by users.	Functional			Yes		D.3.7 Digital Video Audit System
6.7.1.12	The DVAS shall support a minimum of five concurrent users viewing a combination of real time or stored video.	Functional			Yes	This is part of Kapsch standard solution	D.3.7 Digital Video Audit System

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.7.1.13	The DVAS shall provide for video and associated Transaction data covering a user specified date/time range to be exported to any District workstation in a format that can be copied to, and viewed on, any non-System workstation without the need for proprietary codecs or drivers.	Functional			Yes	This is part of Kapsch standard solution	D.3.7 Digital Video Audit System
6.7.1.14	Exporting of DVAS video shall occur in the background and shall not prevent the user from utilizing other System functions.	Functional			Yes	Will be implemented during the design phase.	D.3.7 Digital Video Audit System
6.7.1.16	All DVAS video shall include an overlay of date, time, and lane number.	Functional			Yes	Will be implemented during the design phase.	D.3.7 Digital Video Audit System
6.7.1.17	All DVAS video shall contain a watermark indicating the origin of the video. The watermark information shall be defined in the Design Phase.	Functional			Yes	Will be implemented during the design phase.	D.3.7 Digital Video Audit System
<b>6.8</b>	<b>SYSTEM MONITORING</b>						
<b>6.8.1</b>	<b>Transaction Monitoring</b>						
6.8.1.1	The TSI shall provide a transaction monitoring screen that shall display Toll Transaction details for every vehicle passing through the toll zone in near real time. The information displayed for each Transaction shall be color coded with respect to AVI Title-21, AVI 6C, or IBT and shall include, but not be limited to: <ul style="list-style-type: none"> <li>• Lane Level Transaction ID</li> <li>• Time and Date of Entry</li> <li>• Lane # and Lane Status</li> <li>• AVI Type (T-21, AVI 6C, or IBT)</li> <li>• Transponder Information (depending on protocol)</li> <li>• Transponder Status</li> <li>• Transponder Switch Setting</li> <li>• ALPR #, State, and Confidence level (if done at lane)</li> <li>• Primary Vehicle Class</li> <li>• Secondary Vehicle Class</li> </ul>	Functional			Yes		D.3.8.1 Transaction Monitoring
6.8.1.2	The transaction monitoring screen shall display other Transaction types as well with data relevant to those Transaction types. The data to be displayed shall be finalized during the System Design Phase.	Functional			Yes	Will be implemented during the design phase.	D.3.8.1 Transaction Monitoring
<b>6.8.2</b>	<b>Transaction Research</b>						
6.8.2.1	The TSI shall provide a screen-based tool for researching Transactional information including all Transaction types, RCSC file transfer Transactions, reconciliation status of Toll Transactions, data transfers to the lanes from the Host, unusual occurrences, and Alerts.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.2	The System shall provide Research screens, to facilitate access to data that is available in the Host database.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.3	Research screens shall provide a user-friendly graphical interface that enables users to generate queries that return result sets specific to selected research areas including, but not limited to: <ul style="list-style-type: none"> <li>• Toll Transactions and RCSC reconciliations</li> <li>• System Alerts and events</li> <li>• File transfers between the Host and the RCSC</li> <li>• Data transfers between the Host and the lanes</li> </ul>	Functional			Yes		D.3.8.3 Transaction Research

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.8.2.4	Research screens shall enable users to filter queries on data fields relevant to the research area.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.5	Research screen query filter functionality shall enable users to specify, for each selection field as appropriate:	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.6	Research screen selection criteria and result set fields shall be extensive and comprehensive. Criteria will be determined during the System Design Phase.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.7	Research screen result table displays shall enable users to sort displayed data by each result column.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.8	Research screen result table displays shall enable users to resize, re-order, and hide/un-hide result columns.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.9	Research screens shall limit the size of queries so as not to inhibit the smooth functioning of the System.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.10	The System shall notify users whenever returned results data has been limited by the System.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.11	Research screens shall return a full response to research queries within 30 seconds.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.12	Research screens shall enable users to navigate to related screens or reports that contain more information about displayed result records or result record field values. Such navigation shall be determined during the System Design Phase.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.13	Research screens shall allow the user to select any single row from a returned list of detail records, and then view all available detailed information including associated images and DVAS footage.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.14	Research screen drilldown screens shall themselves enable users to drilldown to more detailed information as appropriate, to be determined during the System Design Phase.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.15	Research screen results and selection criteria displays shall be reconcilable and cross-referential with related System reports through the consistent use of terms, value calculations, selection criteria labels, and data labels.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.16	The System shall enable users to print or to export research screen run time attributes, selection criteria, and result set information to industry standard formats including Microsoft Excel, PDF, CSV and HTML.	Functional			Yes		D.3.8.3 Transaction Research
6.8.2.17	Research screen export formats shall include a data-only format that can be easily imported into and manipulated within Microsoft Excel, Microsoft Access, or a text editor.	Functional			Yes		D.3.8.3 Transaction Research
<b>6.8.3</b>	<b>Dashboard Requirements</b>						
6.8.3.1	The TSI shall provide Dashboard reporting tools that enable users to view System activity, health, and statistics.	Functional			Yes		D.3.8.4 Dashboard Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.8.3.2	<u>Current vs. historic traffic flow, total and by lane.</u> This function shall display AVC detection by vehicle class, and provide transaction breakdown by AVI (each protocol) and IBT types with user configurable default time intervals determined during the Design Phase.	Functional			Yes		D.3.8.4 Dashboard Requirements
6.8.3.3	<u>Current vs historic monthly revenue to date, total and by lane.</u> This function shall display absolute and percentage values with user configurable default time intervals determined during the Design Phase.	Functional			Yes		D.3.8.4 Dashboard Requirements
6.8.3.4	<u>Tolling Zone Operational Status by lane.</u> This function shall display information on the operational status of each lane, such as open/closed, time since last status change, and time until next scheduled change.	Functional			Yes		D.3.8.4 Dashboard Requirements
6.8.3.5	<u>Tolling Zone Health Status by lane.</u> The function shall display information on the health status of each lane, such as overall, communications, and device-specific degraded or failed status. This may be combined with the Operational Status in the Design Phase.	Functional			Yes		D.3.8.4 Dashboard Requirements
6.8.3.6	<u>Alarm history.</u> This function shall display a summary view with representative statistics (numbers and graphics) for a user configurable amount of time. This view shall provide drill down capabilities which show history of all of the alarms for the same corresponding time in tabular form. This table shall be sortable and filterable by field. The maximum amount of records per page shall be determined in the Design Phase.	Functional			Yes		D.3.8.4 Dashboard Requirements
6.8.3.7	<u>Transaction File Status.</u> This function shall indicate the RCSC transaction files that are pending, sent, acknowledged, percent reconciled, and aged transactions. Problematic transactions shall be grouped by their corresponding error code.	Functional			Yes		D.3.8.4 Dashboard Requirements
6.8.3.8	<u>DVAS Selection</u> This function shall give the user the choice of viewing either live video or pre-recorded video over a selected time range from any DVAS camera. When viewing pre-recorded video the user can select forward, reverse, frames per second and freeze on a particular frame.	Functional			Yes		D.3.8.4 Dashboard Requirements
6.8.3.9	The District may modify Dashboard requirements in favor of TSI pre-defined Dashboards. This may be done during the Design Phase.	Informational				Proposer Acknowledges Requirement: Accepted. (Cell is locked and will not accept entries)	D.3.8.4 Dashboard Requirements
6.8.3.10	Proposers shall indicate the functions provided by their Dashboard displays	Proposal	Accepted				D.3.8.4 Dashboard Requirements
6.8.3.11	Proposers shall indicate if users of the Dashboard displays can customize their version of Dashboard displays without effecting other Users.	Proposal	Accepted				D.3.8.4 Dashboard Requirements
6.8.3.12	Proposers shall indicate if their Dashboard applications include filter and drilldown capabilities that enable users to see the details of summarized data.	Proposal	Accepted				D.3.8.4 Dashboard Requirements
6.8.3.13	Proposers shall indicate if their Dashboard applications include the ability to scroll, resize, zoom in/out the displayed information.	Proposal	Accepted				D.3.8.4 Dashboard Requirements
6.8.3.14	Proposers shall indicate if their Dashboard applications give users the ability to export dashboard views to formats including PDF, HTML, PNG, CSV and Excel, and can print from the view to an available local or network printer.	Proposal	Accepted				D.3.8.4 Dashboard Requirements

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<b>6.9</b>	<b>HOST ADMINISTRATION</b>						
<b>6.9.1</b>	<b>User Rights Management</b>						
6.9.1.1	The Host shall control the access and use rights of all System users.	Functional			Yes	This is part of Kapsch standard solution	D.3.9.1 User Rights Management
6.9.1.2	User access to the System shall be via a user name and password.	Functional			Yes	This is part of Kapsch standard solution	D.3.9.1 User Rights Management
6.9.1.3	The Host shall require user passwords to be encrypted and changed a configurable number of days per District policy.	Functional			Yes		D.3.9.1 User Rights Management
6.9.1.4	The System shall require the establishment of various user groups. Access to System functions shall be assigned to one or more of these user groups.	Functional			Yes	This is part of Kapsch standard solution	D.3.9.1 User Rights Management
6.9.1.5	District staff and other users shall be assigned to one or more user groups	Functional			Yes	This is part of Kapsch standard solution	D.3.9.1 User Rights Management
6.9.1.6	One of the defined user groups shall be "Administration" and only members of this group shall be given the authority to alter group rights and group assignments.	Functional			Yes	This is part of Kapsch standard solution	D.3.9.1 User Rights Management
<b>6.9.2</b>	<b>Toll Schedule Management</b>						
6.9.2.1	The toll schedule shall consist of a manually managed database table that establishes the current toll rates and new toll rates beginning on a particular date.	Functional			Yes		D.3.9.2 Toll Schedule Management
6.9.2.2	The Host shall contain a Toll Schedule table in the database with an initial record and a new record added each time the toll schedule changes as established by District policy.	Functional			Yes		D.3.9.2 Toll Schedule Management
6.9.2.3	The Host shall store all toll schedules in the database for the life of the System.	Functional			Yes	Assuming "life of the System" means 10 years per Requirement 3.2.2.1. A question has been raised with the customer.	D.3.9.2 Toll Schedule Management
6.9.2.4	The Host shall ensure that each record in the Toll Schedule Table contains a start date and time on which that toll schedule begins.	Functional			Yes		D.3.9.2 Toll Schedule Management
6.9.2.5	The Host shall ensure that each record in the Toll Schedule Table has a unique ID number.	Functional			Yes		D.3.9.2 Toll Schedule Management
6.9.2.6	The Host shall use the toll schedule record to relate the toll to the vehicle class, Transaction sub-type (AVI or IBT), self-declaration switch setting, carpool hours, and other parameters that effect the toll as established by District Policy.	Functional			Yes		D.3.9.2 Toll Schedule Management
6.9.2.7	The Host shall determine the toll for each Transaction utilizing the toll schedule appropriate for the date and time of the Transaction.	Functional			Yes		D.3.9.2 Toll Schedule Management
6.9.2.8	The Host shall not allow changes or deletions to a toll schedule record once it is used to determine the toll of a Transaction. Changes to the toll schedule shall be made by the insertion of a new toll schedule record.	Functional			Yes		D.3.9.2 Toll Schedule Management
6.9.2.9	The Host shall ensure that all Transaction records include the ID number of the toll schedule used to determine the toll.	Functional			Yes		D.3.9.2 Toll Schedule Management

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
6.9.2.10	The Host shall require the ID and password of two District staff members with appropriate rights to create a new toll schedule record.	Functional			Yes		D.3.9.2 Toll Schedule Management
<b>6.9.3</b>	<b>Carpool Hours</b>						
6.9.3.1	The Host shall enable users to establish nominal AM and PM carpool hours and modify those hours for any day of the year.	Functional			Yes		D.3.9.3 Carpool Hours
6.9.3.2	The Host shall include a table of nominal carpool hours. This one record table will contain the start and end carpool hours to the minute.	Functional			Yes		D.3.9.3 Carpool Hours
6.9.3.3	The Host shall establish a table of daily carpool hours with a record of carpool hours for each day of the year.	Functional			Yes		D.3.9.3 Carpool Hours
6.9.3.4	The Host shall ensure that each record in the table of daily carpool hours has a unique ID number.	Functional			Yes		D.3.9.3 Carpool Hours
6.9.3.5	The Host shall default to the values in the nominal carpool hours for each day but allow the carpool hours for any day to be altered by a user.	Functional			Yes		D.3.9.3 Carpool Hours
6.9.3.6	The Host shall ensure that all Transaction records include the ID number of the daily carpool hours used to determine the toll.	Functional			Yes		D.3.9.3 Carpool Hours
6.9.3.7	The Host shall maintain the records of daily carpool hours for the life of the System.	Functional			Yes	Assuming "life of the System" means 10 years per Requirement 3.2.2.1. A question has been raised with the customer.	D.3.9.3 Carpool Hours
<b>6.9.4</b>	<b>Holiday Calendar</b>						
6.9.4.1	The Host shall include a calendar that lists all holidays for which carpool hours will not apply.	Functional			Yes		D.3.9.4 Holiday Calendar
6.9.4.2	The Host shall allow users to indicate holidays up to fifteen (15) years from the Go-Live date.	Functional			Yes		D.3.9.4 Holiday Calendar
6.9.4.3	The Host shall support a Holiday Calendar Table with one record for each holiday for which carpool hours do not apply.	Functional			Yes		D.3.9.4 Holiday Calendar
6.9.4.4	The Host shall not allow deletion of holiday records once the holiday has passed.	Functional			Yes		D.3.9.4 Holiday Calendar
6.9.4.5	The Transaction processing system shall use the Holiday Calendar in the determination of Transaction tolls.	Functional			Yes		D.3.9.4 Holiday Calendar
<b>7</b>	<b>NETWORK INFRASTRUCTURE</b>						
<b>7.1</b>	<b>CONCEPTUAL NETWORK</b>						
<b>7.1.1</b>	<b>District Network Requirements</b>						
7.1.1.1	The TSI shall provide redundancy in the Gantry switches such that a single switch failure shall not cause a loss in toll revenue.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.2	The TSI shall utilize an internet service provider (ISP) to establish remote access to the System. District approval of the provider and hardware is required. The ISP installed devices shall NOT allow for wireless connection to the System.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.3	The System shall be furnished with a firewall (the TSI ISP Firewall) configured to protect the ISP connection to the System.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.4	protecting the System from the District network and the District network from the System.	Functional					



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
7.1.1.5	The Toll Firewall protecting the System shall be configured and controlled by the TSI.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.6	The Toll Firewall protecting the District network shall be configured and controlled by the District.	Functional					
7.1.1.7	The TSI shall provide three dedicated workstations directly connected to the Toll Network using existing fiber. These workstations shall be fully loaded with all software necessary to operate the System.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.8	The TSI shall furnish, configure and maintain all System network related equipment, cabling, fiber, connectors and other components as necessary to form a fully functioning System network.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.9	The TSI shall use Cisco network products wherever possible.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.10	All fiber, media converters, jumpers and connector types must be approved by the District.	Functional			Yes		D.4.1 Conceptual Network
7.1.1.11	All access to the System via the internet shall use a virtual private network (VPN) connection.	Functional			Yes		D.4.1 Conceptual Network
<b>8</b>	<b>DATA STORAGE AND RECOVERY</b>						
<b>8.1</b>	<b>LANE DATA STORAGE</b>						
<b>8.1.1</b>	<b>Lane Data Storage Requirements</b>						
8.1.1.1	The Zone Controller shall be equipped with sufficient storage capacity to hold at least 60 days of Transaction, image, and detailed sensor data.	Functional			Yes		D.5.1 Lane Data Storage
8.1.1.2	The Zone Controller shall retain all logs (operating system, application, event, etc.) for a period of not less than six (6) months.	Functional			Yes		D.5.1 Lane Data Storage
8.1.1.3	The Zone Controller shall retain all other data not explicitly specified for a period of not less than six (6) months.	Functional			Yes		D.5.1 Lane Data Storage
8.1.1.4	The Zone Controller shall always have a minimum of 50% free disk space.	Functional			Yes		D.5.1 Lane Data Storage
<b>8.2</b>	<b>HOST DATA STORAGE</b>						
<b>8.2.1</b>	<b>Host Data Retention and Personally Identifiable Information Requirements</b>						
8.2.1.1	The Host database shall retain all database data for the required life of the System (except for Images if they are stored in the database).	Functional					
8.2.1.2	The Host shall retain Image data for a minimum of three (3) years.	Functional					
8.2.1.3	The Host shall retain RCSC files (other than the Transponder Status File) for a minimum of one (1) year.	Functional			Yes		D.5.2 Host Data Storage
8.2.1.4	The Host shall retain RCSC Transponder Status Files for a minimum of thirty (30) days.	Functional			Yes		D.5.2 Host Data Storage
8.2.1.5	The Host shall retain application and operating system logs for a minimum of six (6) months.	Functional			Yes		D.5.2 Host Data Storage
8.2.1.6	The TSI shall identify in its Proposal all Personally Identifiable Information (PII) stored by the System.	Functional			Yes		D.5.2 Host Data Storage
8.2.1.7	The Host shall store all PII in encrypted form.	Functional			Yes		D.5.2 Host Data Storage
<b>8.3</b>	<b>HOST BACKUP AND DATA RECOVERY</b>						
<b>8.3.1</b>	<b>Host Backup Requirements</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
8.3.1.1	The Host shall backup all data to a TSI provided cloud backup solution.	Functional			Yes		D.5.3 Host Backup And Data Recovery
8.3.1.2	The Host shall also backup to the cloud backup solution all program executables, configuration data and all other information necessary to affect a complete restoration of all Host functionality.	Functional			Yes		D.5.3 Host Backup And Data Recovery
8.3.1.3	The backup frequency shall be no less than daily.	Functional			Yes	Kapsch will ensure this is done.	D.5.3 Host Backup And Data Recovery
8.3.1.4	In the event that both the primary and secondary Hosts are unavailable, the TSI shall provide a replacement Host, restore from the cloud solution on the replacement Host, and resume all Host processing within seven (7) days.	Functional					
<b>8.3.2</b>	<b>Host Data Recovery Requirements</b>						
8.3.2.1	The Host shall be configured to replicate, in real time, all database data between the primary Host and secondary Host.	Functional			Yes		D.5.3 Host Backup And Data Recovery
8.3.2.2	The Host shall be designed and configured to support a Recovery Point Objective (RPO) of zero (0) data loss, for revenue-related data including RCSC activity.	Functional					
8.3.2.3	The Host shall be designed and configured to support a Recovery Point Objective (RPO) of less than four (4) hours of data loss, for other System data.	Functional			Yes		D.5.3 Host Backup And Data Recovery
8.3.2.4	The Host shall be designed and configured to support a Recovery Time Objective (RTO) of four (4) days, for recovery of full user level and System level functionality, at the required RPO.	Functional			Yes		D.5.3 Host Backup And Data Recovery
8.3.2.5	Failover from the Primary to the Secondary Host or from the Secondary to the Primary Host shall be a manual process.	Functional			Yes		D.5.3 Host Backup And Data Recovery
8.3.2.6	Failover from the Primary to the Secondary Host shall result in no loss of data.	Functional			Yes		D.5.3 Host Backup And Data Recovery
8.3.2.7	Failover from the Primary to the Secondary Host shall cause all devices that communicate with the Host to automatically resume communications with the Secondary Host with no manual intervention. This shall include the Lane, Workstations, and external systems.	Functional			Yes		D.5.3 Host Backup And Data Recovery
<b>9</b>	<b>MAINTENANCE REQUIREMENTS</b>						
<b>9.1</b>	<b>GENERAL</b>						
<b>9.1.1</b>	<b>TSI Responsibility</b>						
9.1.1.1	Basic - The TSI shall be responsible for the correct operation of the System.	Maintenance		Yes			E.2 TSI Responsibility
9.1.1.2	Cost items - In addition to the basic equipment and labor necessary to maintain the System the TSI shall pay for all other required maintenance costs including shipping, communications, internet, spares, third-party support, and necessary support equipment and facilities.	Maintenance					
9.1.1.3	Remote Availability - The TSI shall be available remotely twenty-four (24) hours a day, seven (7) days a week to ensure the System meets all specified performance and functional requirements.	Maintenance		Yes			E.2 TSI Responsibility

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9.1.1.4	On-Site Availability - The TSI shall provide on-site support within required response times if on-site District assistance is not available or able to resolve an issue.	Maintenance		Yes			E.2 TSI Responsibility
9.1.1.5	Period of Performance - The TSI shall provide required maintenance services for a period of five (5) years starting the day the System is opened for public use (i.e., Go-Live).	Maintenance		Yes			E.2 TSI Responsibility
9.1.1.6	Governing Document - The TSI shall perform the maintenance services according to the System Maintenance Manual submitted to and approved by the District.	Maintenance		Yes			E.2 TSI Responsibility
<b>9.1.2</b>	<b>District Responsibility</b>						
9.1.2.1	Lane Closures - If necessary the District will be responsible for all Lane closures required to access equipment on the Gantry or on the roadway.	Maintenance		Yes			E Maintenance Requirements
9.1.2.2	Maintenance of traffic - The District shall provide all maintenance of traffic. The TSI shall follow District and Caltrans procedures for Lane access and all other appropriate safety requirements.	Maintenance		Yes			E Maintenance Requirements
9.1.2.3	Accidents - The TSI shall perform, and the District will pay, for all repairs necessary due to accidents or acts-of-God beyond the control of the TSI.	Maintenance		Yes			E Maintenance Requirements
9.1.2.4	Power - The District will be responsible for providing UPS, generator backed, 120 v power to an external location designated by the TSI as part of the Gantry.	Maintenance		Yes			E Maintenance Requirements
9.1.2.5	Estimated Lane level power requirements shall be specified by the TSI in their Proposal.	Proposal	Accepted				E Maintenance Requirements
9.1.2.6	Repair Assistance - If available, the District will physically check and replace ready-to-go Gantry components.	Maintenance		Yes			E Maintenance Requirements
9.1.2.7	Software - The District will not install any software.	Informational				Proposer Acknowledges Requirement: Accepted. (Cell is locked and will not accept entries)	E Maintenance Requirements
9.1.2.8	Current System Removal - The District will physically disconnect and remove legacy equipment following successful transition of operations and data to the System. The timing of this will be at the District's discretion.	Maintenance		Yes			E Maintenance Requirements
<b>9.1.3</b>	<b>Third-Party Agreements</b>						
9.1.3.1	The TSI shall enter into all necessary third-party support agreements from the original manufacturer or supplier for the following equipment or functions: <ul style="list-style-type: none"> <li>• Host Database</li> <li>• Host Operation System</li> <li>• Transponder Reader</li> <li>• Smart loops (if used)</li> <li>• ALPR</li> <li>• All software license providers</li> </ul>	Maintenance		Yes			E Maintenance Requirements
9.1.3.2	Third-party Agreements shall include the setup and test of at least one System at the TSI development site.	Maintenance		Yes			E Maintenance Requirements
9.1.3.3	Third-party Agreements shall include direct support on the initial installation and calibration of the equipment or function.	Maintenance		Yes			E Maintenance Requirements
9.1.3.4	Third-party Agreements shall include 24X7 priority remote support directly to the product or function, permitting the original manufacturer/supplier to interrogate, monitor, adjust, test, patch, and update software/firmware directly.	Maintenance		Yes			E Maintenance Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
9.1.3.5	The TSI shall be responsible for required response and repair regardless of the terms of the Third-party Agreements.	Maintenance		Yes			E Maintenance Requirements
9.1.3.6	Third-party Agreements shall be in force for the entire duration of the maintenance contract.	Maintenance		Yes			E Maintenance Requirements
9.1.3.7	All third-party support agreements will be between the TSI and the third-party, but all must include provisions stating that they are assignable to the District in the event the Agreement between the District and the TSI terminates or expires.	Maintenance		Yes			E Maintenance Requirements
9.1.3.8	The TSI will be responsible for controlling and monitoring remote system access by third-party service providers.	Procedural		Yes			E Maintenance Requirements
<b>9.1.4</b>	<b>Test Facilities</b>						
9.1.4.1	The TSI shall maintain a test facility that will allow for development, factory testing and testing of new equipment, upgrades, and software changes.	Maintenance					
9.1.4.2	The test facility shall include a fully functional Lane and a fully functional Host	Maintenance		Yes			E Maintenance Requirements
9.1.4.3	The test facility shall be made available for maintenance support if necessary consistent with the specified repair times.	Maintenance		Yes			E Maintenance Requirements
<b>9.1.5</b>	<b>Spare Parts Inventory</b>						
9.1.5.1	The TSI shall be responsible for the purchase, delivery, test and maintenance of all spare parts which shall be interchangeable and equal in quality to original equipment parts.	Maintenance		Yes			E.1.2 Spare Parts Management and Storage
9.1.5.2	The TSI shall establish a program for managing spare parts and equipment in a secure manner that includes: <ul style="list-style-type: none"> <li>• Record keeping of inventories;</li> <li>• Determination of reorder points;</li> <li>• Maintaining supplier information;</li> <li>• Parts acquisition and distribution;</li> <li>• Testing the initial functionality of all spare parts and equipment.</li> </ul>	Maintenance		Yes			E.1.2 Spare Parts Management and Storage
9.1.5.3	The TSI shall make inventory information available to the District upon request.	Maintenance		Yes			E.1.2 Spare Parts Management and Storage
9.1.5.4	The TSI shall keep a sufficient inventory (at least one each of Lane equipment) of spare parts at the District to allow for the prompt replacement of failed components.	Maintenance					
9.1.5.5	The TSI shall keep one of each type of System equipment at the TSI site. This may include equipment used for the test System.	Maintenance		Yes			E.1.2 Spare Parts Management and Storage
9.1.5.6	Spare parts shall include cables, connectors, and related tools that are used in the System.	Maintenance		Yes			E.1.2 Spare Parts Management and Storage
9.1.5.7	The TSI shall replace components that have been repaired three times or more at GGB's option.	Maintenance					

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
9.1.5.8	The TSI shall present to the District a listing of the actual inventory on a quarterly basis.	Maintenance		Yes			E.1.2 Spare Parts Management and Storage
<b>9.1.6</b>	<b>Lane Support Tools</b>						
9.1.6.1	The TSI shall provide all installation, calibration, and diagnostic tools required to maintain and support the System	Maintenance		Yes			E Maintenance Requirements
9.1.6.2	Lane support tools shall be stored at the District or be readily available in support of required repair times.	Maintenance		Yes			E Maintenance Requirements
<b>9.1.7</b>	<b>Coordination of Work</b>						
9.1.7.1	The TSI shall be responsible for the initial response and the identification and isolation of all reported issues.	Maintenance		Yes			E Maintenance Requirements
9.1.7.2	The TSI shall invoke any relevant third-party services agreements as soon as possible and where relevant. However, the TSI remains ultimately responsible for the proper operation of the System.	Maintenance		Yes			E Maintenance Requirements
9.1.7.3	The TSI shall coordinate work with other parties such as DISTRICT electricians, and the Customer Service Center, to fully resolve any issues with the System.	Maintenance		Yes			E Maintenance Requirements
<b>9.1.8</b>	<b>Staffing and Organization</b>						
9.1.8.1	The TSI shall establish and maintain organizational resources appropriate to the work to be performed to maintain the System.	Maintenance		Yes			E Maintenance Requirements
9.1.8.2	The TSI shall assign the appropriate number of knowledgeable trained staff, acceptable to the District, with skills appropriate to the tasks to be performed.	Maintenance		Yes			E Maintenance Requirements
9.1.8.3	The TSI shall ensure that at least two persons employed by the TSI will have the knowledge and ability to maintain any site function at any given time.	Maintenance		Yes		Will be available remotely	E Maintenance Requirements
9.1.8.4	The TSI shall provide qualified persons, acceptable to the District, for relief of the assigned staff in the event of vacation, illness, personal business or any other absence.	Maintenance		Yes			E Maintenance Requirements
9.1.8.5	The TSI shall establish a telephone number (capable of receiving text messages) and email address for reporting problems and placing service requests to technicians.	Maintenance		Yes			E Maintenance Requirements
9.1.8.6	All calls from the District to TSI maintenance shall be answered by a live person.	Maintenance		Yes			E Maintenance Requirements
9.1.8.7	The TSI shall provide maintenance staff with cell phones, laptop computers and wireless internet access to respond to requests for services within the required response time.	Maintenance		Yes			E Maintenance Requirements
9.1.8.8	The TSI, shall, prior to the start of the Maintenance Phase, list the number, location and position of full time staff assigned to System maintenance and the percentage of time allocated to the District's System project. The list shall also indicate any part-time, support, or other staff assigned to the Maintenance work.	Maintenance		Yes			E Maintenance Requirements
9.1.8.9	The TSI shall update the list of Maintenance staff whenever the maintenance staff changes and submit it with the monthly reports.	Maintenance		Yes			E Maintenance Requirements

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9.1.8.10	The TSI shall keep all information regarding its maintenance activities confidential and communicate such information only to authorized District personnel or District designated representatives.	Maintenance		Yes			E Maintenance Requirements
9.1.8.11	The TSI and others under the management of the TSI shall adhere to the District rules and regulations regarding physical access to all bridge properties.	Maintenance		Yes			E Maintenance Requirements
9.1.8.12	All maintenance staff shall pass a District security clearance if required by the District.	Maintenance		Yes			E Maintenance Requirements
<b>9.1.9</b>	<b>Licenses</b>						
9.1.9.1	The TSI shall obtain all necessary software and hardware licenses and assign these licenses to the District.	Maintenance		Yes			E Maintenance Requirements
9.1.9.2	The TSI shall keep all licenses current throughout the contract.	Maintenance		Yes			E Maintenance Requirements
9.1.9.3	The TSI shall ensure that all licenses and the information necessary to maintain those licenses, is in the District's position throughout the contract.	Maintenance		Yes			E Maintenance Requirements
9.1.9.4	The TSI shall keep copies of all licenses throughout the contract.	Maintenance		Yes			E Maintenance Requirements
9.1.9.5	The cost of licenses shall be included in the TSI System and Maintenance pricing.	Maintenance		Yes			E Maintenance Requirements
<b>9.2</b>	<b>TSI ACTIVITIES</b>						
<b>9.2.1</b>	<b>Remote Monitoring and Maintenance</b>						
9.2.1.1	System monitoring includes the requirement that the TSI take immediate corrective action to resolve any detected malfunctions or anomalies.	Maintenance		Yes			E.1.1 Maintenance and Remote Monitoring of all Systems and Subsystems of the RTCS
9.2.1.2	During System operation the TSI shall check System monitoring devices and programs, run-time System utilization parameters, and other diagnostic tools (e.g., file size and allocations, processor loading, response times, etc.) to ensure that all aspects of the System are operating properly and the System is meeting all specified performance criteria. The monitoring schedule shall be included in the System Maintenance Plan.	Maintenance		Yes			E.1.1 Maintenance and Remote Monitoring of all Systems and Subsystems of the RTCS
9.2.1.3	The TSI shall perform reviews of System and regular System upkeep. On a scheduled basis, check the hardware and software components of the System to ensure that all components are present and operating within specified parameters. Based on these reviews, perform needed System upkeep (e.g. purging obsolete files from directories, etc.) to ensure uninterrupted operation of the System.	Maintenance		Yes			E.1.1 Maintenance and Remote Monitoring of all Systems and Subsystems of the RTCS

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
9.2.1.4	The TSI shall monitor the integrity of databases. On scheduled and ad hoc basis as appropriate, review System databases (tables, indexes, views/queries, etc.) to ensure that all databases are properly updated and that appropriate integrity of all System databases is maintained.	Maintenance		Yes			E.1.1 Maintenance and Remote Monitoring of all Systems and Subsystems of the RTCS
9.2.1.5	The TSI shall maintain logs of all scheduled and unscheduled monitoring and System upkeep activities. The logs shall be maintained on the Host and the District shall have access to the logs.	Maintenance		Yes			E.1.1 Maintenance and Remote Monitoring of all Systems and Subsystems of the RTCS
9.2.1.6	The TSI shall maintain logs or other appropriate records of all monitoring activities, anomalies found, and measures taken to correct these anomalies.	Maintenance		Yes			E.1.1 Maintenance and Remote Monitoring of all Systems and Subsystems of the RTCS
9.2.1.7	The TSI shall respond to routine operational requests (e.g. network mask, IP addresses, reconfigure VLAN).	Maintenance		Yes			E.1.1 Maintenance and Remote Monitoring of all Systems and Subsystems of the RTCS
<b>9.2.2</b>	<b>Scheduled Monitoring</b>						
9.2.2.1	The TSI shall verify monthly that every component in the Lane and Host systems is functioning properly. District staff participation in this process shall be limited to observation of fundamental functions such as exterior lighting or Beacon activation. The results of this verification shall be reported to the District monthly.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
9.2.2.2	The TSI shall verify monthly that all Host functions are available and operating properly. The results of this verification shall be reported to the District monthly.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
9.2.2.3	The TSI shall verify daily that all Lane Toll Transactions and images from the previous day have been received by the Host, properly processed, and sent to the RCSC. The results of this verification shall be reported to the District weekly.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
9.2.2.4	The TSI shall verify weekly that all data and images from the previous week have been saved, backed up and stored in the proper location (e.g. Primary and Secondary Zone Controllers, Primary and Secondary Hosts, and Cloud). The TSI shall sample test this data for correctness. The sample size and verification technique shall be included in the SMP. The results of this verification shall be reported to the District weekly.	Maintenance					
9.2.2.5	Once every eight hours, the TSI shall ensure that Transactions are being captured by the System and check the most recent Lane Toll Transaction from each Lane for errors and ensure that it was properly processed, stored, and sent to the Host. Any discovered problems or errors shall be immediately reported to the District and action initiated to correct them.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
9.2.2.6	Once every eight hours, the TSI shall ensure that all license plate images are being captured by the System and check the most recent images from each Lane for errors and ensure that they were properly processed, stored, and sent to the Host. Any discovered problems or errors shall be immediately reported to the District and action initiated to correct them.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
<b>9.2.3</b>	<b>Preventive Maintenance</b>						
9.2.3.1	The TSI shall include in the Maintenance Manual, a comprehensive preventive maintenance schedule that includes daily, weekly, monthly, quarterly and annual preventive maintenance activities and a plan for actively monitoring and reporting on System performance.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
9.2.3.2	Scheduled preventive maintenance shall consist of, but not be limited to, inspecting, testing, calibrating, cleaning, lubricating, adjusting, repairing, and replacing field-installable parts that are approaching unserviceable status, to prevent System failures and extend the useful life of the System. Such maintenance shall be performed in accordance with the equipment manufacturers' recommendations.	Maintenance		Yes		Assuming "life of the System" means 10 years per Requirement 3.2.2.1. A question has been raised with the customer.	E.1.3 Preventive and Corrective Maintenance
9.2.3.3	Preventive maintenance schedules are subject to the approval of the Toll Facility Manager. The TSI shall not remove any piece of equipment from service for preventive maintenance during peak operational periods without prior approval of the Toll Facility Manager.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
9.2.3.4	The TSI shall, as part of the preventive maintenance process, based on experience and analysis, develop parameters to be used to identify, in the early stages, potential problems and actions to be taken to mitigate or prevent potential System issues. These parameters shall be included in the SMP.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
9.2.3.5	During the course of the Maintenance Period the TSI shall continually track and analyze equipment failure and degradation rates in order to predict and modify maintenance service schedules. This analysis shall be based on both the manufacturer's data and historical data accumulated during the maintenance period. Initial analysis shall be included in the SMP and any changes to the analysis shall be included in the monthly report and updated in the SMP.	Maintenance		Yes			E.1.3 Preventive and Corrective Maintenance
<b>9.2.4</b>	<b>Alert Response and Corrective Maintenance</b>						



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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
9.2.4.1	The System shall ensure that the TSI is immediately notified of all Alerts	Maintenance		Yes			E Maintenance Requirements
9.2.4.2	The TSI shall respond to all Alerts and initiate corrective action as required.	Maintenance		Yes			E Maintenance Requirements
9.2.4.3	The TSI shall perform all on-call corrective maintenance that consists of unscheduled actions necessary to diagnose and correct malfunctions and failures in the System and associated components. Corrective maintenance does not include unanticipated maintenance services that are entirely due to occurrences beyond TSI control (e.g., damage due to traffic accidents).	Maintenance		Yes			E Maintenance Requirements
9.2.4.4	The TSI shall, as soon as practical, repair, replace, or maintain any part or parts of the System that become unsuitable for continued use to their original specified performance requirements.	Maintenance		Yes			E Maintenance Requirements
9.2.4.5	The TSI shall provide method and procedures for the District to report problems by phone, email or text and which will generate TSI maintenance logs.	Maintenance		Yes			E Maintenance Requirements
9.2.4.6	The TSI shall establish a protocol and provide a contact list for escalation of issues by the District in the event of an unforeseen emergency and/or failure to respond by the TSI.	Maintenance		Yes			E Maintenance Requirements
9.2.4.7	The Integrator shall repair any hardware or software component after a failure has occurred, either as a whole or in part.	Maintenance		Yes			E Maintenance Requirements
<b>9.2.5</b>	<b>Unanticipated Maintenance</b>						
9.2.5.1	Maintenance services due to unanticipated events that are entirely beyond the TSI's control shall not be included in the fixed price for maintenance and shall be compensated on a time and materials basis. Unanticipated events to which this section applies include acts of God or of the public enemy, fire, floods, epidemics, labor disputes, severe traffic accidents, or other causes deemed by the District to be beyond the reasonable control of the TSI.	Maintenance		Yes			E Maintenance Requirements
9.2.5.2	The TSI shall immediately notify the District of the need for such work and request prior written approval to respond to such an occurrence.	Maintenance		Yes			E Maintenance Requirements
9.2.5.3	The TSI shall then submit a claim to the District to be compensated for this work, based on the hourly rates in the Resource Rate Schedule.	Maintenance		Yes			E Maintenance Requirements
9.2.5.4	The TSI shall maintain a staff of trained personnel of sufficient quantity and quality to ensure that repairs can be performed 24 hours a day, every day of the year in accordance with response and repair requirements.	Maintenance					
<b>9.2.6</b>	<b>Backup</b>						
9.2.6.1	The TSI shall ensure daily backup all software and data in the Host to a District approved cloud site.	Maintenance		Yes			E Maintenance Requirements
9.2.6.2	The District shall have unrestricted access to and use of the backup data.	Maintenance		Yes			E Maintenance Requirements

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
9.2.6.3	All cloud based backups shall be secure and encrypted.	Maintenance		Yes			E Maintenance Requirements
<b>9.2.7</b>	<b>Inspect and Verify</b>						
9.2.7.1	The TSI shall schedule and physically inspect and verify correct operation of the System every six months. Inspection shall include third-party support contractors if required and evaluation of mounting hardware to ensure safety.	Maintenance		Yes			E Maintenance Requirements
9.2.7.2	Following the inspection, the TSI shall develop an inspection report and meet with the District to review.	Maintenance		Yes			E Maintenance Requirements
9.2.7.3	The inspection report shall be kept on the Host.	Maintenance		Yes			E Maintenance Requirements
9.2.7.4	The TSI shall indicate in the proposal the anticipated inspection and verification procedures.	Proposal	Accepted				E Maintenance Requirements
<b>9.2.8</b>	<b>Update</b>						
9.2.8.1	The TSI shall continuously update and bring current all documents and manuals related to the System.	Maintenance		Yes			E Maintenance Requirements
9.2.8.2	The TSI shall continuously update all application software source code to a location agreed to by the TSI and the District.	Maintenance		Yes			E Maintenance Requirements
<b>9.2.9</b>	<b>Meeting and Reporting</b>						
9.2.9.1	The TSI shall schedule and conduct weekly status meetings with the District to inform the District of the performance of the System, any problems noted, and solutions. An activity and status report shall be included with the meeting.	Maintenance		Yes			E Maintenance Requirements
9.2.9.2	The TSI shall submit all written communication related to meetings to the District or other interested parties via e-mail (verbal communications shall be duplicated in e- mail).	Maintenance		Yes			E Maintenance Requirements
9.2.9.3	The TSI shall develop and make available to the District, reports that provide information on all maintenance activities. The reports shall be in enough detail to be used for performance monitoring and shall be attached with each billing cycle.	Maintenance		Yes			E Maintenance Requirements
9.2.9.4	The TSI shall provide a Monthly Spare Parts Use Report detailing the use of spare parts for preventive or corrective maintenance; noting the number of repairs or replacements of high value parts and components.	Maintenance		Yes			E Maintenance Requirements
9.2.9.5	The TSI shall provide a Monthly Work Order History Report detailing the following information: o Histogram showing the time between failures, time to respond and repair, and total number of calls. o All corrective work including but not limited to: • Specific date problem was reported • Log number • Action taken • Date and time of completion • Technician assigned o Open calls and calls exceeding the response time by priority	Maintenance		Yes			E Maintenance Requirements

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9.2.9.6	The TSI shall provide a Monthly Maintenance Activity Status Report containing, at a minimum, a complete statement of work status.	Maintenance		Yes			E Maintenance Requirements
9.2.9.7	The TSI shall provide a Monthly Actual to Scheduled Maintenance Report comparing actual maintenance to scheduled maintenance for the previous month and listing of maintenance activities scheduled for the upcoming month.	Maintenance		Yes			E Maintenance Requirements
9.2.9.8	All reports shall be located in the Host reporting database to permit the generation of custom reports based on maintenance data.	Maintenance					
<b>10</b>	<b>SYSTEM DOCUMENTS AND PLANS</b>						
<b>10.1</b>	<b>SYSTEM DOCUMENTS</b>						
<b>10.1.1</b>	<b>System Design Document</b>						
10.1.1.1	the design of the System and details the realization of the entire System including equipment, procedures, operating scenarios, exceptions, schematics, file structure, data element, message structure, integration, and database definition.	Procedural		Yes			F System Documents And Plans
10.1.1.2	Each version of the SDD shall be submitted to the District for review and approval, and address the submittal and approval of both overall design as well as individual sections outlined below.	Procedural		Yes			F System Documents And Plans
10.1.1.3	The System Design Document (SDD) shall address and explain all areas of the System design, be tied to the requirements traceability matrix (RTM), and fully describe the System, including, but not limited to: <ul style="list-style-type: none"> <li>• System architecture (hardware and software);</li> <li>• Database design (data elements and definitions);</li> <li>• Equipment functions and installations;</li> <li>• Alerts and maintenance management systems;</li> <li>• Data flows from the lanes to the financial and audit reports;</li> <li>• Data processing logic for processing and reporting toll Transactions under different modes and statuses.</li> <li>• System and user interfaces;</li> <li>• User access and security;</li> <li>• Data storage, security and integrity;</li> <li>• Backup and data recovery;</li> <li>• Prototype of financial reports;</li> <li>• Audit application to drill down to transaction details</li> <li>• Audit features to isolate anomalies, equipment malfunction, pinpoint errors, omissions, and other variances;</li> <li>• Transaction data and structure (Lane and Host);</li> <li>• Interfaces with RCSC and other subsystems;</li> <li>• Network, storage and power requirements for ICS, DVAS and the System in general.</li> </ul>	Procedural		Yes			F System Documents And Plans
10.1.1.4	The TSI shall submit the SDD in three stages, each of which shall require direct discussion, review and approval by the District. The stages are Preliminary SDD (PSDD), Detailed SDD (DSDD), and Final SDD (FSDD).	Procedural		Yes			F System Documents And Plans
10.1.1.5	The TSI shall submit a PSDD document which shall consist the SDD shall consist of a detailed outline of the entire document with references to all required appendix and attachments. Each primary and secondary section of the outline shall include a short (one paragraph) description of the contents of that section.	Procedural		Yes			F System Documents And Plans
10.1.1.6	Meetings and discussions to answer questions and clarify issues shall be held as needed to ensure that the SDD will include all necessary information.	Procedural		Yes			F System Documents And Plans

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.1.1.7	<p>Following approval of the PSDD the TSI shall submit the DSDD which shall include but is not limited to the following critical areas:</p> <ul style="list-style-type: none"> <li>• Lane <ul style="list-style-type: none"> <li>• Lane/Host ICD</li> <li>• DVAS Integration</li> <li>• Lane/DVAS Images and ALPR</li> <li>• Vehicle processing in all lanes (exceptions &amp; anomalies)</li> <li>• Data elements captured by the Zone Controller</li> </ul> </li> <li>• Host <ul style="list-style-type: none"> <li>• Transaction Processing;</li> <li>• Administration screens (DVAS, file transfers, stuck Transaction files, carpool hours, toll table, users, etc.)</li> <li>• RCSC ICD</li> <li>• Traffic and Management Reports</li> <li>• Buffered and Isolated Transponder processing</li> <li>• Financial reporting and audit applications</li> <li>• Processing of RCSC Transactions</li> <li>• Dashboards</li> </ul> </li> <li>• General <ul style="list-style-type: none"> <li>• System hardware and architecture</li> <li>• Maintenance screens and Alerts</li> <li>• ORT design</li> <li>• User access and security</li> <li>• Database architecture</li> <li>• Data storage, access and integrity</li> <li>• Backup and disaster recovery</li> <li>• End-to-end Transaction flow</li> <li>• System controls and safeguards</li> </ul> </li> </ul>	Procedural		Yes			F System Documents And Plans
10.1.1.8	The TSI shall submit the DSDD for review by the District fifteen (15) business days in advance of the scheduled DSDD review.	Procedural		Yes			F System Documents And Plans
10.1.1.9	The TSI shall conduct a detailed DSDD workshop consisting of a series of interactive workshops lead by the TSI with formal presentations to the District on the System design, a walkthrough of critical areas, further clarify requirements, and review or resolve comments on the DSDD.	Procedural		Yes			F System Documents And Plans
10.1.1.10	provide final comment resolutions, written description of changes to the design identified during the DSDD workshops, meeting minutes, and any outstanding action items. If the outcome of the DSDD has any impact on the schedule, the TSI shall provide a proposed revised schedule. Upon receipt of this documentation, the District shall determine whether to approve the DSDD. The District may choose to approve the design for key design areas separately.	Procedural		Yes			F System Documents And Plans
10.1.1.11	Upon approval of the entire DSDD the TSI may submit the FSDD.	Procedural		Yes			F System Documents And Plans
10.1.1.12	The TSI shall conduct on-line meetings and a final workshop to review and confirm how the FSDD addresses the RTM.	Procedural		Yes			F System Documents And Plans
10.1.1.13	Upon approval of the FSDD the TSI shall proceed to the Development Phase	Procedural		Yes			F System Documents And Plans

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.1.1.14	Any System development performed by TSI prior to GGB's approval of the entire SDD, shall be done at TSI's risk, unless specific design areas are designated and approved for development in writing by the District.	Procedural		Yes			F System Documents And Plans
10.1.1.15	The TSI shall submit an as-built SDD prior to Final System Acceptance.	Procedural		Yes			F System Documents And Plans
<b>10.1.2</b>	<b>System User's Manual</b>						
10.1.2.1	The TSI shall develop User Manuals that provide instructions on how and when to use all features and functions of the System.	Procedural		Yes			F System Documents And Plans
10.1.2.2	Prior to developing User Manuals, the TSI shall prepare for the District's review and approval, an annotated outline depicting the proposed content for all User Manuals.	Procedural		Yes			F System Documents And Plans
10.1.2.3	Standard user manuals for commercial products will be acceptable if they contain sufficient information to service the component equipment.	Procedural		Yes			F System Documents And Plans
<b>10.1.3</b>	<b>System Maintenance Manual</b>						
10.1.3.1	The TSI shall deliver the Maintenance Manual to the District for approval at least 60 days prior to Go-Live. The TSI shall provide the Maintenance Manuals in soft copy as well as two copies in three-ring binder format to facilitate updating and integration with the SMP.	Procedural		Yes			F System Documents And Plans
10.1.3.2	System description narratives and schedule of periodic testing, troubleshooting and maintenance requirements of all System functions (such as file transfers), which encompass hardware and software across the various levels of the System.	Procedural		Yes			F System Documents And Plans
10.1.3.3	necessary in any of the following areas: general description, theory of operation, operator instructions, detailed electrical/electronic logic circuit analysis, mechanical functions, installation, test and trouble-shooting procedures, preventive and corrective maintenance procedures. The Maintenance Manual shall also contain diagrams, schematics, layouts and parts lists required to service each component and circuit board utilized in the System.	Procedural		Yes			F System Documents And Plans
10.1.3.4	supplement the SDD in the areas of: third-party maintenance manuals, functional block diagrams, switch settings interconnections, circuit board locations, and power requirements. The manual shall include the brand name, model number, the source of the product including contract information such as telephone number, e-mail address, and sales consultant, and quantity of each item specified. Periodic testing and maintenance requirements shall be specified.	Procedural		Yes			F System Documents And Plans
10.1.3.5	The TSI shall include a software section of the maintenance manual to supplement the SDD in the areas of: file structures, message structures and protocol, third-party software manuals and a configuration and installation guide indicating step-by-step procedures for initializing replacement computers and reinstalling software from a backup copy for each individual computer. The Software Maintenance manual shall include the brand name and version number of each third-party software package utilized in the System.	Procedural		Yes			F System Documents And Plans

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.1.3.6	The System Maintenance Manual shall describe the following System maintenance program components: <ul style="list-style-type: none"> <li>• Preservation policies and performance standards</li> <li>• Maintenance, repair, and preservation approaches and process schematics</li> <li>• Installation and setup plans</li> <li>• Diagnostic hardware and software tools and techniques</li> <li>• Resource requirements, roles, and responsibilities</li> <li>• Schedule of activities, including preventive maintenance activities such as scheduled inspection, renewal or replacement, and testing of on-site and off-site System components</li> <li>• Quality control/assurance procedures.</li> <li>• Maintenance management including the handling of Alerts, work orders, reports, inventory, scheduled preventative maintenance, scheduled monitoring, and monitoring results.</li> </ul>	Procedural		Yes			F System Documents And Plans
<b>10.2</b>	<b>PROJECT PLANS</b>						
<b>10.2.1</b>	<b>Installation Plan</b>						
10.2.1.1	The TSI shall prepare and submit a detailed Installation Plan sixty (60) days prior to the start of installation, that addresses System installation at both a System-wide level and a Lane level.	Procedural		Yes			F System Documents And Plans
10.2.1.2	The Installation Plan shall address, but not be limited to the following: <ul style="list-style-type: none"> <li>• Duties and responsibilities of all parties</li> <li>• Detailed installation sequencing and procedures</li> <li>• Coordination of testing activities during transition</li> <li>• System interfaces</li> <li>• Safety planning addressing customers, client, and contractors</li> <li>• Lane closure preparation and procedures</li> <li>• Specification of the space, network and power requirements</li> </ul>	Procedural		Yes			F System Documents And Plans
10.2.1.3	The Installation Plan shall outline all steps necessary to obtain approvals for installation of the System.	Procedural		Yes			F System Documents And Plans
10.2.1.4	The TSI shall maintain a punch list during installation for review with the District Project Manager on a weekly basis.	Procedural		Yes			F System Documents And Plans
10.2.1.5	The District, Caltrans and/or their designee shall have access and time to inspect all aspects of installation.	Procedural		Yes			F System Documents And Plans
<b>10.2.2</b>	<b>Transition Plan</b>						
10.2.2.1	The TSI shall prepare and submit a detailed Transition Plan 30 days prior to the start of transition, that addresses all testing, training, and performance verification procedures.	Procedural		Yes			F System Documents And Plans
10.2.2.2	The Transition Plan shall include a Training Plan, Production Readiness Test Plan, and Cutover Plan.	Procedural		Yes			F System Documents And Plans
<b>10.2.3</b>	<b>Data Migration Plan</b>						
10.2.3.1	The TSI shall migrate current system data to the System. The details of what data will be migrated will be developed during the System Design Phase.	Functional					
10.2.3.2	The migration of data shall take into consideration data elements that exist in the System but not in the current system and shall properly populate those data elements to allow all System screens and reports to function properly.	Functional					

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.2.3.3	The TSI shall develop a comprehensive Data Migration Plan detailing the TSI's overall approach to the migration of data from the current system to the System. The Data Migration Plan shall define what data is moved, where it is moved from, where it is moved to, how it is moved, when it is moved, and approximately how long the move shall take.	Functional					
10.2.3.4	The Data Migration Plan shall contain a detailed mapping of current system tables and fields to the tables and fields in the System. This mapping shall clearly define any data transformations that shall be required, any data summarizations that shall be performed, and any other data manipulations which may be required to complete the migration. It shall also clearly define what data will not be migrated and why. The mapping shall also define the data migration sequence - which tables must be migrated in which order to ensure data integrity.	Functional					
10.2.3.5	The Data Migration Plan shall provide a conceptual and procedural overview of the actual data migration process including descriptions of the overall method. Key assumptions, external dependencies, and risks associated with the proposed migration process shall be documented.	Functional					
10.2.3.6	The Data Migration Plan shall provide a detailed migration timeline showing each step in the migration process, responsible parties, expected durations, data validation points, etc.	Functional					
10.2.3.7	The Data Migration Plan shall contain a section with migration data validation procedures, queries, reports, and any other tools necessary to demonstrate that the migration was completed successfully. The validation tools shall clearly highlight unexpected results and exceptions. Included in this section shall be rollback procedures in the event that the migration must be aborted.	Functional					
<b>10.2.4</b>	<b>Training Plan</b>						
10.2.4.1	The TSI shall be responsible for District training in the areas of operations, database design, and maintenance.	Procedural		Yes			F System Documents And Plans
10.2.4.2	The TSI shall prepare and submit for District review, comment, and approval a Training Plan with a supportive training delivery schedule.	Procedural		Yes			F System Documents And Plans
10.2.4.3	The TSI shall be responsible for providing all materials required to conduct the training.	Procedural		Yes			F System Documents And Plans
10.2.4.4	Training shall be provided by professional, qualified trainers supported by appropriate technical experts.	Procedural		Yes			F System Documents And Plans
<b>10.2.5</b>	<b>Cutover Plan</b>						
10.2.5.1	The TSI shall develop a cutover plan to ensure a seamless transition from the current system to the new System at one point in time.	Procedural		Yes			F System Documents And Plans
10.2.5.2	The TSI cutover plan shall ensure that the RCSC data exchange is in accordance with the accepted RCSC ICD.	Procedural		Yes			F System Documents And Plans
10.2.5.3	The TSI cutover plan shall ensure that the System is cleared of all test data and all control files and users are established at the time of cutover.	Procedural		Yes			F System Documents And Plans

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.2.5.4	The TSI cutover plan shall incorporate the concept that the current system shall continue operating with the exception of RCSC file transfer.	Procedural		Yes			F System Documents And Plans
10.2.5.5	The TSI cutover plan shall address the responsibilities of all System users and fall back to the current system if necessary.	Procedural		Yes			F System Documents And Plans
<b>10.2.6</b>	<b>System Maintenance Plan</b>						
10.2.6.1	The TSI shall submit an outline of the System Maintenance Plan (SMP) in the Proposal.	Proposal					
10.2.6.2	The Preliminary System Maintenance Plan shall include the following information at a minimum: <ul style="list-style-type: none"> <li>• Proposed Maintenance Manager</li> <li>• List of maintenance staff positions including capabilities and availability</li> <li>• Monitoring and Alert response plan</li> <li>• Remote access and controls</li> <li>• Periodic operational checks</li> <li>• District training areas</li> <li>• Local test facilities</li> <li>• Device and computer failover controls</li> </ul>	Procedural		Yes			F System Documents And Plans
10.2.6.3	The TSI shall develop and institute a System Maintenance Plan for the System. The SMP shall be submitted to the District for approval in modifiable MS Word to format facilitate commenting and updating. The submission date shall be no later than 90 days prior to the scheduled start of installation.	Procedural		Yes			F System Documents And Plans
10.2.6.4	The SMP shall define the policies, roles, responsibilities, schedule of activities, and resources, including third-party equipment and software vendors, for maintaining the System software and hardware at the lane, and Host levels.	Procedural		Yes			F System Documents And Plans
10.2.6.5	The SMP shall describe how the TSI will maintain a hardware/equipment inventory.	Procedural		Yes			F System Documents And Plans
10.2.6.6	The SMP shall include current descriptive inventory of all System software, source code, and changes to the software on a System wide basis.	Procedural		Yes			F System Documents And Plans
10.2.6.7	The SMP shall include an annual condition assessment of System components, with an emphasis on critical components whose failures would lead to major disruptions in System functionality and performance. The assessment shall include a product availability report including any manufacturer end-of-life/end-of- product support timeline and/or migration plans to a newer supported product line in order to keep all components in the system supportable, repairable, and available.	Procedural		Yes			F System Documents And Plans
10.2.6.8	The SMP shall describe scheduled and random quality control and assurance testing of System components as well as overall System performance.	Procedural		Yes			F System Documents And Plans
10.2.6.9	The SMP shall include procedures for developing and updating preventive maintenance schedules to ensure preventive maintenance occurs outside of the peak travel periods;	Procedural		Yes			F System Documents And Plans
10.2.6.10	The SMP shall include the response in dealing with contingencies such as emergency maintenance, sick employees, or vehicular crashes at or near tolling equipment or the Host;	Procedural		Yes			F System Documents And Plans



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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.2.6.11	The TSI shall update all relevant documentation when making changes to the System.	Procedural		Yes			F System Documents And Plans
10.2.6.12	Documentation in support of maintenance shall include final as-builts in modifiable CAD format.	Procedural		Yes			F System Documents And Plans
<b>10.2.7</b>	<b>Business Continuity Plan</b>						
10.2.7.1	The Proposer shall provide a comprehensive Business Continuity plan in their Proposal.	Procedural					
10.2.7.2	The Proposer's Business Continuity Plan shall detail potential risks and threats to System operations.	Procedural		Yes			F System Documents And Plans
10.2.7.3	The Proposer's Business Continuity Plan shall detail recovery strategies for each potential risk and threat to System operations, and shall describe how the proposed System design and staffing will accomplish the required RPO and RTO in each case.	Procedural		Yes			F System Documents And Plans
10.2.7.4	The Proposer's Business Continuity Plan shall include a detailed description of the Proposer's approach to data recovery testing.	Procedural		Yes			F System Documents And Plans
10.2.7.5	The Proposer's Business Continuity Plan shall propose a detailed schedule of data recovery testing exercises.	Procedural		Yes			F System Documents And Plans
<b>10.3</b>	<b>TEST PLANS</b>						
<b>10.3.1</b>	<b>Factory Acceptance Test (FAT) Plan</b>						
10.3.1.1	The TSI shall conduct a Factory Acceptance Test to verify that the System functionality is present and all approved System requirements and designs have been satisfied before equipment is shipped and installed on site.	Procedural		Yes			F System Documents And Plans
10.3.1.2	The TSI shall prepare and provide a FAT Plan as in accordance the testing requirements.	Procedural		Yes			F System Documents And Plans
10.3.1.3	The FAT Plan shall clearly list requirements that the TSI will not test at this stage and the reason for their exclusion. These excluded requirements shall be subject to District review and approval. The TSI shall ensure that each requirement that is not excluded is tested and certified compliant by the District.	Procedural		Yes			F System Documents And Plans
10.3.1.4	The FAT shall be conducted at the TSI's facility or a facility mutually agreeable to the District and the TSI, which has been pre-approved by the District for adequacy and suitability. The FAT shall be conducted at a location in the continental United States.	Procedural		Yes			F System Documents And Plans
10.3.1.5	The FAT site infrastructure, environment, size, and composition shall be capable of demonstrating the operation of the System within the full operating range under which the production System is expected to perform as defined herein. Any exceptions to this shall be requested by the TSI, in writing, as soon as the deviation(s) are known by the TSI, but no fewer than 60 days in advance of the planned testing dates. Any and all exceptions shall require District approval.	Procedural		Yes			F System Documents And Plans
10.3.1.6	The FAT shall follow a set of Transactions through various use cases that demonstrate the work flow and functionality of various subsystems and processes.	Procedural		Yes			F System Documents And Plans

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Requirements Traceability Matrix

Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.3.1.7	The TSI shall perform each test as described in the FAT Plan in its entirety with the use of the System equipment and components as specified in the design.	Procedural		Yes			F System Documents And Plans
10.3.1.8	At least one unit of every hardware and software component furnished, as part of the System, shall be fully integrated as part of the FAT.	Procedural		Yes			F System Documents And Plans
10.3.1.9	The FAT shall include the testing of switchable and non-switchable transponders of both Title-21 and 6C protocols.	Procedural		Yes			F System Documents And Plans
10.3.1.10	The TSI shall demonstrate that the hardware and software included in the FAT is a fully integrated System and is capable of operating end-to-end.	Procedural		Yes			F System Documents And Plans
10.3.1.11	FAT shall include a stress test to demonstrate that the System meets the performance requirements when operating under peak conditions. District approved simulated inputs and tools may be used to demonstrate that the full processing load can be achieved including database sizing.	Procedural		Yes			F System Documents And Plans
10.3.1.12	Validation and testing of reports shall be performed during the FAT including running predefined reports and creating ad hoc reports.	Procedural		Yes			F System Documents And Plans
<b>10.3.2</b>	<b>CSC Integration Test (CIT) Plan</b>						
10.3.2.1	The TSI shall develop the exact form of RCSC transponder status and Transaction files (AET and IBT) for both required protocols and the expected response files.	Procedural		Yes			F System Documents And Plans
10.3.2.2	The TSI shall conduct test file transfers with the RCSC	Procedural		Yes			F System Documents And Plans
10.3.2.3	In parallel with the rest of the System Design and Development Phases, the TSI shall interface with the RCSC using simulated files to verify the correct receipt, processing, posting, and reconciliation of all Transaction types and content.	Procedural		Yes			F System Documents And Plans
<b>10.3.3</b>	<b>Gantry Equipment Field Test (GEFT) Plan</b>						
10.3.3.1	Following installation of the Gantry, equipment on the Gantry, zone controller equipment and Host equipment, TSI shall allow a maximum of 4 weeks for a Gantry Equipment/zone controller/Host Field Test.	Procedural		Yes			F System Documents And Plans
10.3.3.2	GEFT shall include testing: <ul style="list-style-type: none"> <li>• Gantry Equipment</li> <li>• Zone Controllers</li> <li>• Host</li> <li>• All components integrated together</li> </ul>	Procedural		Yes			F System Documents And Plans
<b>10.3.4</b>	<b>Production Readiness Test (PRT) Plan</b>						
10.3.4.1	The TSI shall conduct a Production Readiness Test (PRT) for a minimum of 30 days prior to Go-Live.	Procedural		Yes			F System Documents And Plans
10.3.4.2	The TSI shall conduct the PRT without interfering with the current system which will remain in operation throughout the PRT.	Procedural		Yes			F System Documents And Plans
10.3.4.3	The TSI shall conduct the PRT utilizing live traffic to ensure correct operation of the entire System.	Procedural		Yes			F System Documents And Plans

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
10.3.4.4	The TSI shall ensure that the PRT exercises all functions of the System. Interaction with the RCSC shall be controlled to ensure that test Transactions do not interfere with actual toll Transactions.	Procedural		Yes			F System Documents And Plans
10.3.4.5	The TSI shall compare the Transactions from the System to the Transactions from the current system as part of the accuracy and performance measurement processes.	Procedural		Yes			F System Documents And Plans
10.3.4.6	Acceptance of the PRT shall require that the System meet all availability, accuracy, and performance requirements.	Procedural		Yes			F System Documents And Plans
10.3.4.7	At the completion of the PRT the System, Lane and Host, shall be cleared of all data collected in previous tests.	Procedural		Yes			F System Documents And Plans
<b>10.3.5</b>	<b>System Acceptance Test (SAT) Plan</b>						
10.3.5.1	The TSI shall demonstrate full production operation of the System, with live traffic and RCSC processed Transactions.	Procedural		Yes			F System Documents And Plans
10.3.5.2	The TSI shall use the SAT to verify that the System is performing to the required standards of availability and accuracy.	Procedural		Yes			F System Documents And Plans
10.3.5.3	The TSI shall conduct the SAT for a minimum of 30 days or until it has been demonstrated that the performance of the System is within the required standards.	Procedural		Yes			F System Documents And Plans
<b>11</b>	<b>PERFORMANCE REQUIREMENTS</b>						
<b>11.1</b>	<b>PERFORMANCE STANDARDS</b>						
<b>11.1.1</b>	<b>General</b>						
11.1.1.1	The Proposer shall provide a detailed description of the proposed System's performance capabilities and how the System shall address the requirements in this section.	Proposal	Accepted				D.2.8.1
11.1.1.2	The Proposer shall demonstrate that the proposed solution has operated with proven functionality in a tolling environment similar to that of the District and is achieving performance similar to that required herein.	Proposal	Accepted				D.2.8.1
11.1.1.3	The System shall achieve the required performance levels under traffic conditions typically experienced at the Golden Gate Bridge, including but not limited to stop-and-go, bumper-to-bumper traffic to vehicles traveling at up to 100 miles per hour. While the District does not typically expect speeds up to 100 miles per hour, the District requires a System that can perform at such speeds.	Performance		Yes			D.2.8.1
11.1.1.4	The System shall maintain the required performance levels 24 hours a day, seven days a week, regardless of ambient lighting conditions.	Performance		Yes			D.2.8.1
<b>11.1.2</b>	<b>Availability</b>						
11.1.2.1	Lane - The Lane system shall be designed and maintained to be 100% available and operated 24 hours per day and seven days per week.	Functional			Yes	The proposed solution includes active-active zone controllers and each of which are hot-swappable and each of which includes several hot swappable modules	D.2.8.2
11.1.2.2	A toll lane is defined as the region under the gantry striped to align traffic for optimum toll collection.	Informational	Accepted				D.2.8.2
11.1.2.3	Lane - A toll Lane shall be designated as unavailable when it is unable to produce correct AVI or IBT Toll Transactions.	Performance		Yes			D.2.8.2
11.1.2.4	Lane - The TSI shall record Lane unavailable times in the Host database.	Functional			Yes		D.2.8.2

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
11.1.2.5	Host - The Host level system shall be designed and maintained to operate 24 hours per day and seven days per week at an availability rate of 96% per day.	Performance					
11.1.2.6	Host - The Host shall be designated as unavailable when it is unable to perform one or more of its designated functions.	Performance		Yes			D.2.8.2
11.1.2.7	Host – The TSI shall record all Host unavailable times, including the allowable 4% in the Host database.	Functional			Yes		D.2.8.2
<b>11.1.3</b>	<b>Transaction Accuracy</b>						
11.1.3.1	A Toll Transaction is either correct or it is not. Consequently, there can be no more than one "Transaction Error" per Toll Transaction regardless of the number of incorrect fields in the Toll Transaction itself.	Informational	Accepted				D.2.8.3
11.1.3.2	The System shall be designed and maintained to produce and deliver, on time to the RCSC, one and only one correct Toll Transaction per vehicle for 99.5% of all vehicles passing through the tolling zone.	Performance		Yes			D.2.8.3
11.1.3.3	information: <ul style="list-style-type: none"> <li>• Correct Transaction ID</li> <li>• Correct Transaction Type</li> <li>• Correct vehicle entry date and time</li> <li>• Correct vehicle exit date and time</li> <li>• Correct Protocol Indicator</li> <li>• Correct Transponder Data</li> <li>• Correct AVC vehicle parameters (height, width, profile, etc.)</li> <li>• Correct vehicle speed</li> <li>• Correct lane</li> <li>• Correct Lane Health indicator</li> <li>• Correct usable front plate image</li> <li>• Correct usable rear plate image</li> <li>• Correct Vehicle Class (primary and secondary)</li> <li>• Correct Transponder Status</li> <li>• Correct* fare</li> <li>• Correct** ALPR(s) and Confidence Level(s)</li> </ul> The TSI shall record, to the extent possible each occurrence in which any of the above is not correct. * This may be done at the Host level. ** A correct ALPR and Confidence Level in this case shall mean correct association of that information with the license plate(s) for the IBT Transaction. ALPR accuracy is covered under another performance	Performance		Yes			D.2.8.3
11.1.3.4	The TSI shall automatically record, to the extent possible, a single "Transaction Error" for any Toll Transaction in which the required Transaction information is not correct or missing.	Functional			Yes		D.2.8.3
11.1.3.5	The TSI shall categorize, date and log each incorrect event and corresponding Transaction ID.	Functional			Yes		D.2.8.3
11.1.3.6	The TSI shall summarize incorrect events for reporting and viewing purposes.	Functional			Yes		D.2.8.3
<b>11.1.4</b>	<b>Transaction Processing and Reporting Accuracy</b>						
11.1.4.1	The System shall transmit all Toll Transactions to the RCSC within 24 hours of their occurrence in the Lane.	Performance		Yes			D.2.8.4
11.1.4.2	The System shall produce accurate and scheduled revenue reports on all Toll Transactions and CSC reconciliation activity.	Performance		Yes			D.2.8.4
<b>11.1.5</b>	<b>ALPR Accuracy</b>						

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Requirement Number	Requirement	Requirement Type	Proposer Acknowledges Requirement	Will be met in execution of SOW?	Fully Supported by Proposed System ?	Comments	Proposal Reference(s)
11.1.5.1	ALPR Accuracy requirements shall apply to Image Based Tolls (IBT) only.	Informational	Accepted				D.2.8.5
11.1.5.2	The System shall produce Confidence Levels such that a Confidence Threshold may be established wherein the ALPR Yield shall be at least 50% with an ALPR Error Rate of no more than 0.1%.	Performance		Yes			D.2.8.5
11.1.5.3	The TSI shall calculate the ALPR Yield as follows: Number of usable images with Confidence Level >= Confidence Threshold / Number of usable images	Functional			Yes		D.2.8.5
11.1.5.4	An ALPR Error is defined as an incorrect ALPR plate number and/or state with a Confidence Level >= Confidence Threshold.	Informational	Accepted				D.2.8.5
11.1.5.5	The TSI shall calculate the ALPR Error Rate as follows: Number of usable images with Confidence Level >= Confidence Threshold and incorrect Plate Data / Number of Usable Image Sets with Confidence Level >= Confidence Threshold	Functional			Yes		D.2.8.5
11.1.5.6	The TSI shall calculate the ALPR Yield and ALPR False Positive Rate monthly using all images collected for IBT Transactions over the entire month.	Functional			Yes		D.2.8.5
<b>11.1.6</b>	<b>Response Time</b>						
11.1.6.1	Response Time is defined as the time between the generation of an Alert (automatic or manual) and the acknowledgement of the Alert by a TSI manager or technician assigned to the project.	Informational	Accepted				D.2.8.6
11.1.6.2	The TSI shall meet response and repair times for corrective maintenance according to the issue as defined below.	Performance		Yes			D.2.8.6
11.1.6.3	Service requests by persons (i.e., not automatic) shall be acknowledged in kind (e.g. phone, e-mail, text, etc.).	Performance		Yes			D.2.8.6
11.1.6.4	Priority 1 Alerts - Instances that put revenue collection at risk. The TSI shall respond to and repair Priority 1 issues within 2 hours.	Performance		Yes			D.2.8.6
11.1.6.5	Priority 2 Alerts - All other failures. The TSI shall respond to and repair Priority 2 issues within 24 hours.	Performance		Yes			D.2.8.6

**Price Proposal Sheet 1: Implementation Costs Itemization**

Line #	Implementation Component	Unit	Quantity	Unit Price (\$) <sup>8</sup>	Total Price (\$)	Notes on assumptions <sup>7</sup>
<b>Project Development</b>						
1	Project Management	Lump Sum	1	\$294,619.18	\$294,619.18	
2	Design and Documentation <sup>1</sup>	Lump Sum	1	\$258,553.86	\$258,553.86	
3	Installation Costs <sup>2</sup>	Lump Sum	1	\$269,283.95	\$269,283.95	
3	Training Materials and Courses	Lump Sum	1	\$116,526.83	\$116,526.83	
4	Escrow	Lump Sum	1	\$15,201.09	\$15,201.09	
5	Performance Bond	Lump Sum	1	\$20,905.52	\$20,905.52	
6	Third Party Support Contracts (List under "Other Items" <sup>3</sup> )	Lump Sum	1	\$0.00	\$0.00	
7				\$0.00	\$0.00	
8				\$0.00	\$0.00	
9				\$0.00	\$0.00	
<b>Subtotal - Project Development</b>					<b>\$975,090</b>	
<b>Lane System <sup>4</sup></b>						
10	Zone Controller Hardware	Toll Zone	2	\$11,327.29	\$22,654.58	
11	Zone Controller Software	Toll Zone	0	\$0.00	\$0.00	
12	AVI System	Toll Zone	1	\$137,434.29	\$137,434.29	
13	AVC System	Toll Zone	1	\$232,376.44	\$232,376.44	
14	ICS System	Toll Zone	1	\$185,609.06	\$185,609.06	
15	DVAS System	Toll Zone	1	\$45,514.18	\$45,514.18	
16	Enforcement Beacon System	Toll Zone	1	\$2,416.75	\$2,416.75	
17	All other parts and pieces	Toll Zone	1	\$80,007.23	\$80,007.23	See BOM for Details
18					\$0.00	
<b>Subtotal - Lane System</b>					<b>\$706,013</b>	
<b>Host System <sup>4</sup></b>						
19	Host System Hardware	Lump Sum	1	\$347,667.83	\$347,667.83	
20	Host System Software	Lump Sum	1	\$225,389.68	\$225,389.68	
21					\$0.00	
<b>Subtotal - Host System</b>					<b>\$573,058</b>	
<b>Network Infrastructure <sup>4</sup></b>						
22	Network Infrastructure Equipment	Lump Sum	1	\$13,748.12	\$13,748.12	
23	Network Infrastructure Software and Services	Lump Sum	1	\$0.00	\$0.00	
24					\$0.00	
<b>Subtotal - Network Infrastructure</b>					<b>\$13,748</b>	
<b>System Testing <sup>5</sup></b>						
25	Factory Acceptance Test	Lump Sum	1	\$411,806.40	\$411,806.40	
26	CSC Integration Test	Lump Sum	1	\$106,990.80	\$106,990.80	
27	Gantry Equipment Field Test	Lump Sum	1	\$100,969.14	\$100,969.14	
28	Production Readiness Test	Lump Sum	1	\$108,591.38	\$108,591.38	
29	System Acceptance Test	Lump Sum	1	\$136,080.70	\$136,080.70	
<b>Subtotal - System Testing</b>					<b>\$864,438</b>	
<b>Other Optional Items <sup>6</sup></b>						
30	Spare Parts	Lump Sum	1	\$104,791.70	\$104,791.70	
31					\$0.00	
32					\$0.00	
33					\$0.00	
34					\$0.00	
35					\$0.00	
<b>Subtotal - Other Optional Items</b>					<b>\$104,792</b>	
<b>Total RTCS Implementation Cost</b>					<b>\$3,237,139</b>	

- Notes:
1. Does not include specific test plan documentation. These are included under "system testing."
  2. Includes installation of all components. Does not include commissioning (see Note #4).
  3. The unit price shall match the sum of the costs of all of the Third Party Support Contracts listed under "Optional Items."
  4. Includes all material and labor costs for procuring and commissioning (installation is separate, see Note #2); software includes licensing and custom development.
  5. Includes all steps to plan and conduct and document these specific tests.
  6. Add any items not included in the specified or optional items under the component groups that support the proposed solution. For the third party support items, just list the names, units and quantities. Do not enter Unit Price.
  7. Note any assumptions that you consider important in justifying your cost.
  8. Prices assume a configuration of 7 lanes. For different lane configurations (i.e., 5 and 6 lanes), input each representative cost in sheet PS-5 - Total Price.

## Price Proposal Sheet 2: Implementation Milestones Payments Allocation

Project Phase and Milestone Name	Payment % of Total Implementation Cost	Milestone Payment Amount (\$)
Phase 1: Definition and Business Rules	6%	\$194,228
Phase 2: System Design	7%	\$226,600
Phase 3: System Development	15%	\$485,571
Phase 4: Installation	35%	\$1,132,999
Phase 5: Transition	24%	\$776,913
Phase 6: System Acceptance	13%	\$420,828
<b>Total RTCS Implementation Cost</b>		<b>\$3,237,139</b>

Notes: This sheet does not provide from any type of input. Percentages are provided by the District and are independent of the itemized costs provided by the Proposer in Sheet PS-1.

### Price Proposal Sheet 3A: Maintenance Payment Schedule

Line #	Maintenance Component	Maintenance Fee Per Month					Y1-5 Annual Δ %
		Year 1	Year 2	Year 3	Year 4	Year 5	
<b>Base Contract Maintenance Fees</b>							
1	Labor (PS-3B) <sup>1</sup>	\$24,429	\$25,284	\$26,169	\$27,085	\$28,033	From PS-4
2	Materials	\$1,763	\$1,825	\$1,889	\$1,955	\$2,023	3.50%
3	Recurring SW/HS Support Lic's	\$827.45	\$856	\$886	\$917	\$950	3.50%
4	0	\$0.00	\$0	\$0	\$0	\$0	3.50%
5	ODC's	\$1,580.89	\$1,636	\$1,693	\$1,753	\$1,814	3.50%
6	Subtotal Per Month	<b>\$28,600</b>	<b>\$29,601</b>	<b>\$30,637</b>	<b>\$31,710</b>	<b>\$32,819</b>	
7	# Months per Year <sup>2</sup>	12	12	12	12	12	<b>Total Y1-5</b>
8	Total Per Year <sup>2</sup>	<b>\$343,203</b>	<b>\$355,215</b>	<b>\$367,648</b>	<b>\$380,515</b>	<b>\$393,833</b>	<b>\$1,840,415</b>
<b>Optional Extension Maintenance Fees</b>							
		Year 6	Year 7	Year 8			<b>Y6-8 Annual Δ %</b>
9	Labor (PS-3B) <sup>1</sup>	\$29,014	\$30,029	\$31,080			3.50%
10	Materials	\$2,094	\$2,167	\$2,243			3.50%
11	Recurring SW/HS Support Lic's	\$983	\$1,017	\$1,053			3.50%
12	0	\$0	\$0	\$0			3.50%
13	ODC's	\$1,878	\$1,943	\$2,011			3.50%
14	Subtotal Per Month	<b>\$33,968</b>	<b>\$35,157</b>	<b>\$36,388</b>			
15	# Months per Year <sup>2</sup>	12	12	12			<b>Total Y6-8</b>
16	Total Per Year <sup>2</sup>	<b>\$407,618</b>	<b>\$421,884</b>	<b>\$436,650</b>			<b>\$1,266,152</b>

- Notes:
1. Labor populates automatically from Sheet PS-3B.
  2. The number of months per year and total cost per year assumes completion of a contract year during the maintenance period.



### Price Proposal Sheet 3B: Monthly Maintenance Labor Detail

Line #	Staff Position <sup>1</sup>	Base Contract (Maintenance Year 1)			Optional Extension (Maintenance Year 6)		
		Hours/Mo.	Avg. Rate/Hr	Total \$/Mo.	Hours	Avg. Rate/Hr	Total \$/Mo.
1	Maintenance Manager	40	\$117.06	\$4,682	40	\$139.03	\$5,561
2	Project Manager	40	\$142.74	\$5,710	40	\$169.53	\$6,781
3	Technician	80	\$65.31	\$5,225	80	\$77.57	\$6,205
4	SW Eng	40	\$105.67	\$4,227	40	\$125.50	\$5,020
5	DB Eng	40	\$114.63	\$4,585	40	\$136.14	\$5,446
6				\$0			
7				\$0			
8				\$0			
9				\$0			
10				\$0			
<b>Total Labor per month</b>				<b>\$24,429</b>			<b>\$29,014</b>

Notes: 1. Please cut & paste each desired position from the Staff Position colum in PS-4 - Labor Rates

### Price Proposal Sheet 4: Proposed Project Staff Labor Rates

Line #	Staff Name	Staff Position	Loaded Hourly Billing Rates and % Increase by Year - Base Contract Period <sup>1</sup>						
			Imp. Year 1	Imp. Year 2	Maint. Year 1	Maint. Year 2	Maint. Year 3	Maint. Year 4	Maint. Year 5
			% ->	3.50%	% ->	3.50%	3.50%	3.50%	3.50%
<b>Key Staff</b>			Hourly Rates (\$)						
1	Tony Marti	Project Manager	\$133.25	\$137.91	\$142.74	\$147.73	\$152.90	\$158.26	\$163.79
2	Craig Koudelka	Gantry Coordinator	\$112.13	\$116.05	\$120.11	\$124.32	\$128.67	\$133.17	\$137.83
3	Pavel Podiinsky	RCSC Coordinator	\$133.25	\$137.91	\$142.74	\$147.73	\$152.90	\$158.26	\$163.79
4	Daniel La Fuente	Maintenance Manager	\$109.28	\$113.10	\$117.06	\$121.16	\$125.40	\$129.79	\$134.33
<b>Support Staff <sup>2</sup></b>			Hourly Rates (\$)						
5	TBD	Technician	\$60.97	\$63.10	\$65.31	\$67.59	\$69.96	\$72.41	\$74.94
6	TBD	SW Eng	\$98.65	\$102.10	\$105.67	\$109.37	\$113.20	\$117.16	\$121.26
7	TBD	DB Eng	\$107.01	\$110.75	\$114.63	\$118.64	\$122.79	\$127.09	\$131.54
8									
9									
10									
11									
12									
13									
14									
15									
16									

- Notes:
1. Please provide base year rates for both the development and the maintenance phases of the base contract period.
  2. Please include the 6-12 Support Staff as required in the Proposal Instructions

**Price Proposal Sheet 5: Total Price**

Line #	Pricing Per # of Lanes	Base Contract Period Cost			Optional Maintenance Contract Extention Periods Cost			
		Development	Maint Years 1-5	Total 5th year <sup>1</sup>	Maint year 6	Maint Year 7	Maint Year 8	Total 8th year <sup>1</sup>
1	Implementation + Maintenance (5 Lanes)	\$2,953,825	\$1,773,335	<b>\$4,727,159</b>	\$392,761	\$406,507	\$420,735	<b>\$5,947,162</b>
2	Implementation + Maintenance (6 lanes)	\$3,095,482	\$1,806,875	<b>\$4,902,356</b>	\$400,189	\$414,196	\$428,693	<b>\$6,145,434</b>
3	Implementation + Maintenance (7 lanes)	\$3,237,139	\$1,840,415	<b>\$5,077,553</b>	\$407,618	\$421,884	\$436,650	<b>\$6,343,705</b>

Notes: 1. Implementation + maintenance costs by end of 5 or 8 year maintenance period starting after go-live.  
Please note that the Price Evaluation will be based on the amount in cell E7 (in orange).