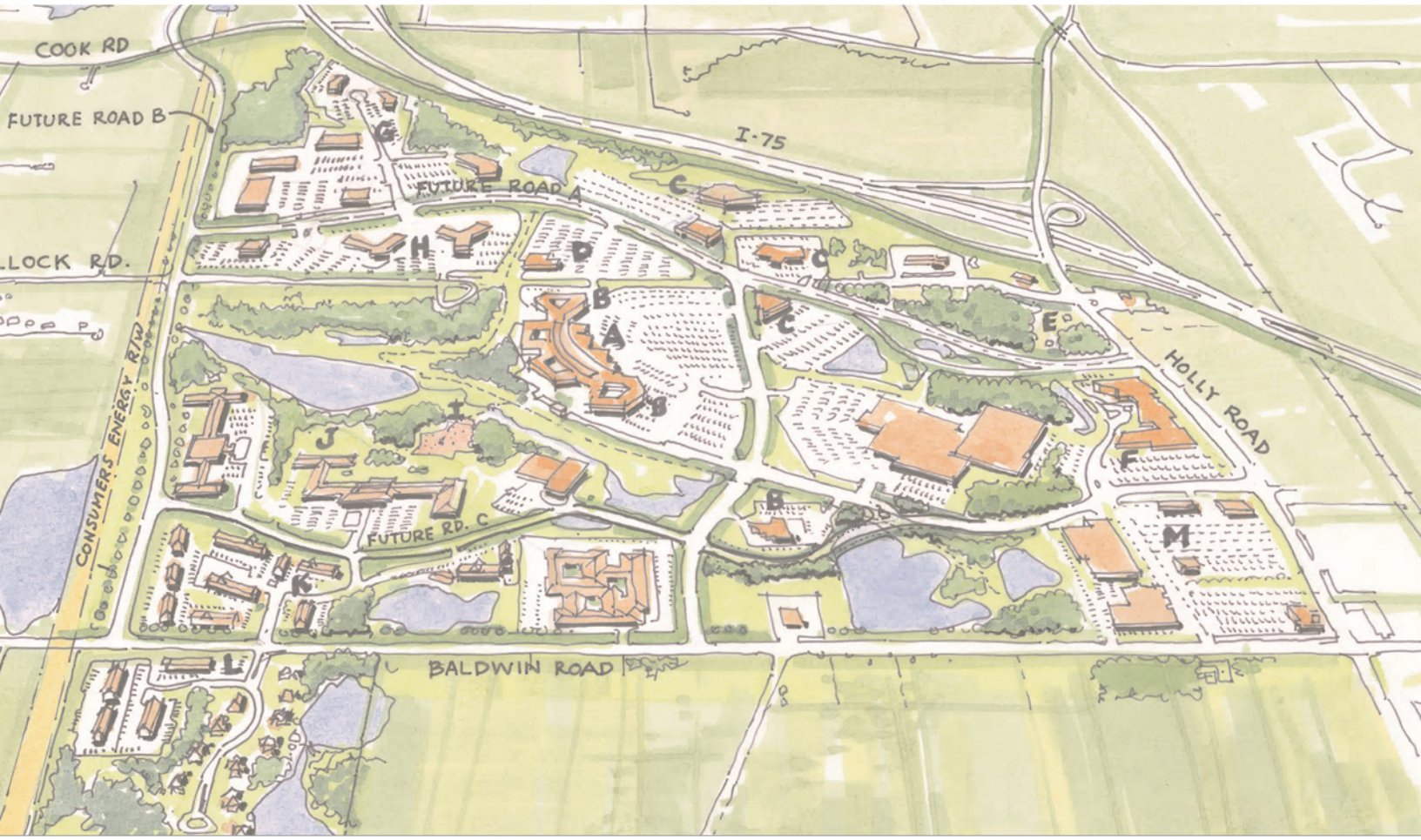
GENESEE COUNTY ROAD COMMISSION IN COOPERATION
WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION AND
FEDERAL HIGHWAY ADMINISTRATION



ENVIRONMENTAL ASSESSMENT

FOR THE PROPOSED CORRIDOR EXTENSION OF DORT HIGHWAY SOUTH
FROM THE INTERCHANGE OF I-75 NORTH (EXIT 109) TO
BALDWIN ROAD IN GENESEE COUNTY, MICHIGAN
CS-PRIP 25074
JN-115503

MAY 30, 2017

ROAD GENESEE COUNTY COMMISSION

U.S. Department of Transportation
Federal Highway Administration

MDOT
Michigan Department of Transportation

ENVIRONMENTAL ASSESSMENT

For the proposed corridor extension of Dort Highway south from the interchange of I-75 north (Exit 109) to Baldwin Road in Genesee County, Michigan

Prepared by:
Genesee County Road Commission in cooperation with the Michigan Department of Transportation and Federal Highway Administration

Approved:

8-16-2017
Date

Mark G. Lewis, PE

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for the Federal Highway Administration

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PREFACE

The National Environmental Policy Act (NEPA) of 1969 requires the social, economic and natural environmental impacts of any proposed action of the federal government to be analyzed for decision-making and public information purposes. There are three classes of action. Class I Actions are those that may significantly affect the environment and require the preparation of an Environmental Impact Statement (EIS). Class II Actions (or "categorical exclusions") are those that do not individually or cumulatively have a significant effect on the environment, and do not require the preparation of an EIS or an Environmental Assessment (EA). Class III Actions are those in which the significance of impacts is not clearly established. Class III Actions require the preparation of an EA to determine the significance of impacts and the appropriate environmental document to be prepared – either an EIS or a Finding of No Significant Impact (FONSI).

This document is an EA for the proposed extension of the Dort Highway corridor south from I-75 (Exit 109) to Baldwin Road in Genesee County, Michigan. It describes and analyzes alternatives, potential impacts, and the measures proposed to minimize harm to the project area. It will be distributed to the public and various federal, state, and local agencies for review and comment. A formal public hearing on this project will be held. If review and comment by the public and interested agencies support the determination of "no significant impact," the EA will be forwarded to the Federal Highway Administration (FHWA) with a recommendation that a FONSI be issued. If it is determined that the Preferred Alternative will have "significant impacts" that cannot be mitigated, preparation of an EIS will be required.

This document was prepared through a Consultant for the Genesee County Road Commission, in cooperation with the Michigan Department of Transportation and FHWA. Information contained in the EA was also provided by other federal and state agencies, local units of government, and public interest groups.

TABLE OF CONTENTS

List of Figures

List of Tables

List of Appendices

1.0 DESCRIPTION OF PROJECT AREA

The study area of the Environmental Assessment includes the southern half of Grand Blanc Township in Genesee County, Michigan. The data collected for analysis in this section is from a variety of government sources, which may include different years for the most recent data. This section summarizes the project's impacts within the corridor study area.

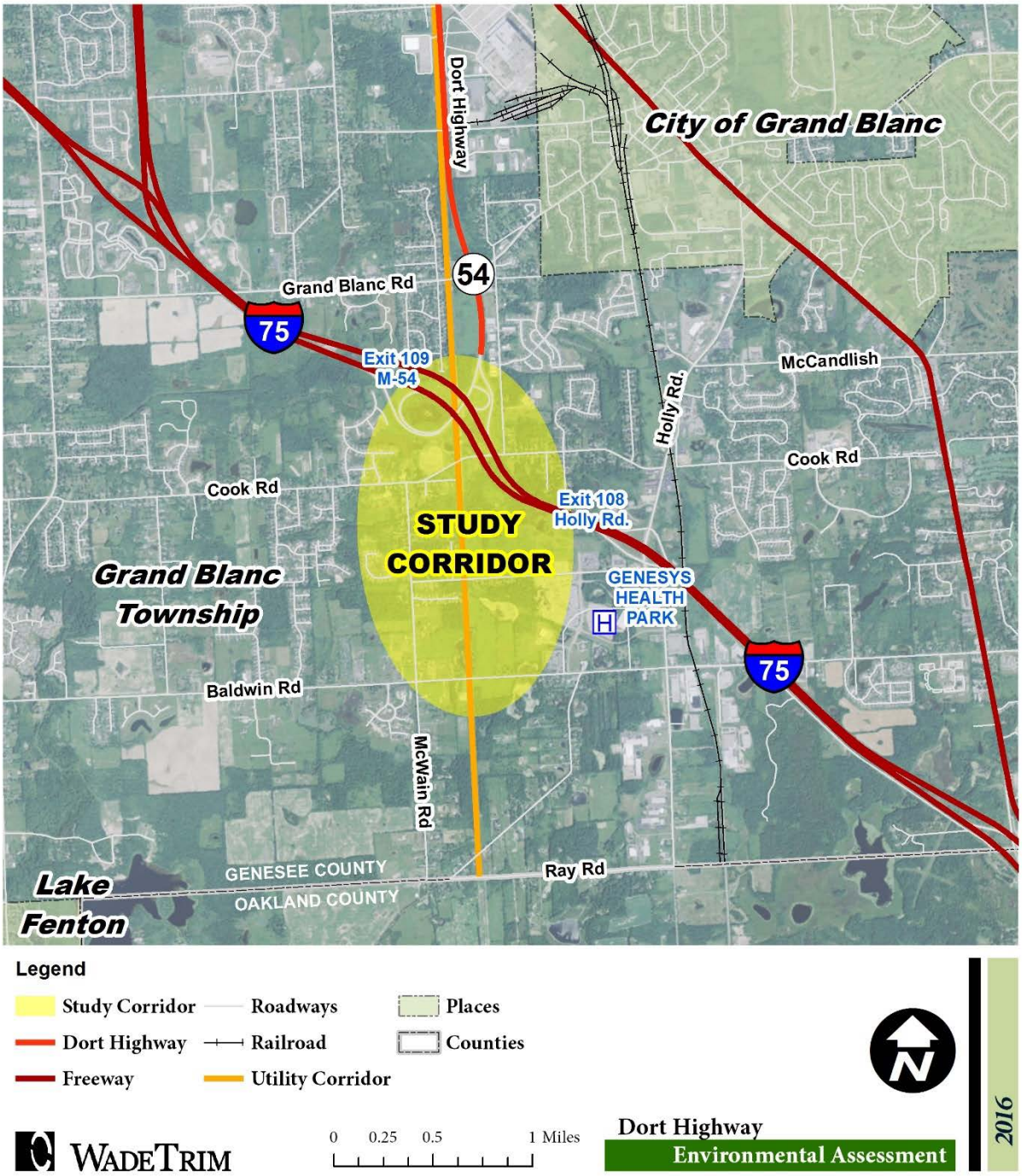
1.1 PROJECT LOCATION

The proposed project is located in Grand Blanc Township, approximately 33 square miles in size, within Sections 20, 21 and 28 of southeast Genesee County. Dort Highway is a state trunkline originally built in the early 1960s from the city of Flint to Saginaw County. The general population to potentially be served by this improvement is 400,000 to 500,000 people in southern Genesee, northern Oakland and northeastern Livingston counties.

1.2 EXISTING CONDITIONS

The Dort Highway corridor, as shown in Figure 1-1, is generally defined as the 600 acres between the southerly terminus of Dort Highway at I-75 south to Baldwin Road. When I-75 was designed, a connection was made to I-75 (Exit 109) to allow access to Dort Highway from north of the interchange. However, a southern extension to Baldwin Road was not made due to issues concerning right-of-way (ROW) acquisition. The study corridor is bounded on the east by I-75 and Holly Road and 250 feet to the west of the McWain Road centerline. Access from I-75 to Genesys Health Park, one of the largest employers in Genesee County, is limited to the Holly Road interchange (Exit 108) and along a series of county roads that include seasonal weight-restricted routes. The proposed road extension is a new alignment that would directly connect Genesys Health Park with I-75 and the growing development south of their campus along Baldwin Road and Holly Road. With this access improvement in mind, Genesys Health Park has agreed to donate the necessary ROW along the western edge of the 484 acres in their ownership between Baldwin Road, and south of Cook Road.

Figure 1-1. Dort Highway Location Map and Study Corridor



The Dort Highway project has been in various stages of development for more than 40 years. This extension has been included in all succeeding regional transportation plans, including the most recent, *Freight and Connectivity Study, 2011*. The project is also supported locally by Grand Blanc Township, as expressed in the Township's Master Plan (2013 Supplemental Amendment), as a key component of a planned Technology Village encompassing 4,000 acres including Genesys Health Park's campus.

In 1992, Genesys Health Park began development of the property bounded by Baldwin Road to the south, Holly Road to the east and I-75 to the north. This development was followed by additional health-related commercial and industrial developments along Holly and Baldwin roads. In addition, residential development increased in this area of the Township during the late 1990s and early 2000s. Currently, I-75, I-475, US 23, and Dort Highway are operating at acceptable levels of service, and with the additional projected development, are expected to remain within acceptable levels of service. However, the Holly Road interchange is currently operating at a level of service "D" and approaching maximum capacity. Congestion along Baldwin Road and at the Holly Road interchange are impediments to responsible growth, much needed economic development opportunities, and safe local roads for this area of Genesee County and Grand Blanc Township. The Dort Highway project coupled with the Holly Road Interchange Improvements will significantly relieve congestion and improve safety as well as allow for the region's economic expansion. Improvements to the Holly Road interchange are expected to be completed before the proposed Dort Highway project. It has also been previously determined that Baldwin Road will need improvements including expansion from a two-lane road to a five-lane road.

2.0 PURPOSE AND NEED

The Genesee County Road Commission (GCRC) is facilitating an environmental review to determine the impacts of alternatives for extending Dort Highway from I-75 to Baldwin Road on a new alignment (see Figure 1-1 Dort Highway Location Map and Study Corridor). The proposed preliminary design includes one lane in each direction, turn lanes at select intersections and a ten-foot-wide shared-use path on the east side of the roadway to accommodate non-motorized traffic. Transit stops are proposed for the corridor extension. The final locations of the bus stops will be coordinated with the regional mass transit agency as part of the final design phase. The objective of the project is to alleviate congestion in the area, improve safety and connectivity to the medical campus, and enhance the transportation network serving Genesys Health Park. In addition, the proposed corridor extension will increase opportunities for new commercial, industrial, medical and residential development in southern Genesee County. Recent development proposals have been advanced to the planning stage including commercial development on Holly and Baldwin roads as well as a proposed technology park at Baldwin and Saginaw roads. Infrastructure investments supporting these new developments are an essential part of a regional economic development initiative that will diversify and ultimately transform the region's economic base from agriculture and manufacturing to health and life sciences services.

MDOT is advancing improvements to the Holly Road Interchange. MDOT has developed road plans and obtained approval for constructing a northbound loop ramp to I-75 to address the delay and crashes created by the current heavy left-turn movement from northbound Holly onto the northbound ramp to I-75. The plans do not address any other traffic issues on Holly Road south of the interchange. Congestion along Holly Road will be mitigated for a short time after this improvement is in operation. However, as additional build out occurs within the Genesee Health Park Regional Center, congestion will increase along Holly Road which requires the Dort Highway Extension to mitigate congestion.

To proceed with the proposed action, an Environmental Assessment (EA) is necessary to define and analyze potential impacts of the proposed action and evaluate reasonable alternatives. This EA was developed to determine if any potential impacts are significant enough to warrant an Environmental Impact Statement (EIS). During the course of the project, investigations to identify potential Social, Economic, and Environmental (SEE) impacts related to these proposed transportation improvements were considered. The SEE impacts are documented in this EA as required by the National Environmental Policy Act of 1969.

2.1 PROJECT DEVELOPMENT PROCESS

The project development process includes the progression of studying, designing and constructing a given transportation improvement project that involves federal funds or requires federal permits to be created. The sequence of phases typically involved in a transportation improvement project include:

1. Preliminary Studies: This phase includes feasibility studies, initial investigations, problems and solutions identification, and public input. At this phase, proposed improvements are conceptual with limited design or technical studies performed.
2. Environmental Investigations and Compliance (current project): This phase includes more in-depth studies to identify and define problems, develop alternatives to address those problems, and determine the likely impacts of those alternatives on the human and natural environment. The Environmental Assessment Study (EA) phase considers the environmental regulations that govern the nation's resources, and attempts to identify a Preferred Alternative that best minimizes any negative impacts and is considered prudent and feasible when compared to other alternatives. The Dort Highway project is currently in this phase. Once the EA has been accepted for public review and comment by MDOT and FHWA; a formal public hearing on this project will be held and a 30-day review and comment period will occur. It is anticipated from the findings of this EA that a Finding of No Significant Impact (FONSI) would be appropriate for this project. However, the determination of the final NEPA documentation for this project will be based on the comments received at the public meeting and the comments received on this document.
3. Design and Engineering: During this phase, the Preferred Alternative is typically designed and final engineering plans are developed. Required environmental permits are obtained and property acquisition begins or continues if the property is not already owned by the agency leading the project.
4. Construction: During this phase, a construction contractor is selected to build the Preferred Alternative based on the results of the Design and Engineering phase. Ultimately, the project is built and opened for public use.

2.2 PROJECT HISTORY

The proposed project is located in Grand Blanc Township, approximately 33 square miles in size, within Sections 20, 21 and 28 of southeast Genesee County. Dort Highway is a state trunkline and was originally built in the early 1960s and extended from the city of Flint to Saginaw County. The intersection of Dort

Highway at I-75 (Exit 109) was originally built in the early 1980s. The general population to potentially be served by this improvement is approximately 400,000 to 500,000 people in the southern Genesee, northern Oakland and northeastern Livingston counties.

The study corridor is generally defined as the 600-acre area between the southerly terminus of Dort Highway south to Baldwin Road. While a connection was initially made to I-75 (Exit 109) to allow access to Dort Highway from north of the interchange, a southern extension to Baldwin Road was not made due to issues concerning right-of-way (ROW) acquisition. Access from I-75 to Genesys Health Park, one of the largest employers in the county, is limited to the Holly Road interchange (Exit 108) and along a series of county roads which include seasonal weight-restricted routes. The proposed corridor extension would be a new alignment that would directly connect Genesys Health Park with I-75 and the growing development south of the Park along Baldwin Road and Holly Road. With this improvement in mind, Genesys Health Park has agreed to donate the necessary ROW along the western edge of the 484 acres in their ownership north of Baldwin Road.

The Dort Highway project has been in various stages of development for more than 40 years. This extension has been included in all succeeding regional Metropolitan Planning Organization long-range transportation plans, including the most recent, *Freight and Connectivity Study, 2011*. The Dort Highway project is also supported locally by Grand Blanc Township, as expressed in the Township's Master Plan (2013 Supplemental Amendment), as a key component of a planned Technology Village encompassing 4,000 acres including Genesys Health Park's campus.

A time line of the history of this project is summarized below:

1987 - The Dort Highway Extension is completed south from Hill Road west past Grand Blanc, to a new interchange with I-75 at Exit 109. The former alignment of M-54 through Grand Blanc is turned back to local control. A proposed further southerly extension of the Dort Highway Extension south to Cook Road is not completed at this time and the highway terminates at the interchange with I-75.

1993 to 1994 - The land needed to construct the proposed southerly extension of the Dort Highway Extension between I-75 at Exit 109 and the intersection of Cook and McWain roads just to the south is sold off in two parcels in February 1993 and March 1994. By doing so, MDOT and the GCRC seem to signal that such an extension is unnecessary.

In 1992, Genesys Health Park began development of the property bounded by Baldwin Road to the south, Holly Road to the east, and I-75 to the north. This development was followed by additional health-related commercial and industrial developments along Holly and Baldwin roads. In addition, residential development increased in this area of the Township during the late 1990s and early 2000s. Currently, I-75, I-475, US 23, and Dort Highway are operating at acceptable levels of service. With the additional projected development, the highways are expected to remain within acceptable levels of service. However, the Holly Road interchange is currently operating at a level of service "D" and approaching maximum capacity. Congestion along Baldwin Road and at the Holly Road interchange are impediments to responsible growth, much needed economic development opportunities, and safe local roads for this area of Genesee County and Grand Blanc Township. The Dort Highway project coupled with the Holly Road Interchange Improvements will help relieve congestion and improve safety as well as allow for the expansion of the economy within the region. Improvements to the Holly Road interchange are expected to be completed prior to the proposed Dort Highway project.

2.3 PROJECT PURPOSE

The purpose of the proposed Dort Highway project is to enhance the mobility of the area by expanding access, increasing connectivity and improving emergency response times. The project has been in the planning stages for more than 40 years. As early as 1965, access easements and ROW acquisitions were underway for the future road extension. All local and regional transportation plans pertaining to the area have included Dort Highway as a future project.

Specific goals of the proposed project include:

- Increase safety by providing additional access to I-75 in a growing cluster of mixed-use development as well as provide relief for overburdened local roads.
- Provide access to the existing Genesys Health Park and existing and future residential, healthcare, and commercial development within the surrounding developable lands.
- Increase traffic capacity and improve traffic flow.
- Improve non-motorized circulation by providing a shared-use, non-motorized and pedestrian path within the proposed roadway section where needed and connecting with the existing Genesys campus trail system.

- Meet the goals of Grand Blanc Charter Township and Genesee County for extending Dort Highway from I-75 (Exit 109) to Baldwin Road.
- Enhance the overall transportation network within the area by providing a logical street pattern, while minimizing social, environmental and economic impacts.
- Improve emergency vehicle response times to Genesys Health Park.

2.4 PROJECT NEED

Two primary needs are acting as the impetus and justification for considering alternatives that would extend Dort Highway from I-75 (Exit 109) to Baldwin Road.

2.4.1 Improve Connectivity to Genesys Health Park

Extending Dort Highway will provide a much needed southern connection from the area north of I-75 to Genesys Health Park. Currently, the campus has the following facilities:

- Main Medical Center
- Athletic Club, Conference and Banquet Center
- MRI Facility
- Medical Office Building and Surgery Center

The current campus supports 3,100 staff and health practitioners. The medical center has 410 beds and 140,000 square feet of medical office space. The athletic club has 62,000 square feet of office space, a 107,000-square-foot health club including athletic facilities, tennis courts, and swimming pools, and a 10,000-square-foot conference and banquet center that can seat 600 people. The existing medical office building is approximately 25,000 square feet. A full range of in-patient and out-patient treatment and services are provided at the campus. The Genesys Health Park expansion plans include:

- 390,000-square-foot Senior Living/Mixed Use Facility
- 20,000-square-foot Outpatient Care Facility
- 175,000-square-foot Ambulatory Care and Learning Center
- 450,000-square-foot Research and Development Facility
- 80 Residential Units
- 282,000-square-foot Retail-Conference Facilities

Private capital investment and development plans for expansion account for an investment of more than $483 million. Employment at build-out of the campus is expected to exceed 4,000 employees. Therefore, the Genesys Health Park and coincidental private investment is expected to accelerate the transformation of the regional economy from that of manufacturing to the higher skilled workforce of the healthcare industry.

Since the Dort Highway extension has been planned for years, Genesys Health Park has relied on this planned transportation infrastructure improvement in the planning of their campus. The improved connectivity will support continued investment and transformative economic development in this area of Genesee County.

2.4.2 Improved Safety, Traffic Capacity and Flow

Extending Dort Highway will provide much needed relief to congestion experienced on local roads as a result of the poor network of arterial roads in this area of the county. A crash analysis was conducted for this EA to identify collision patterns and concentrations of crashes, and to develop a set of countermeasures to improve safety as a result of construction. For the five-year period from December 31, 2011, to December 31, 2015, crash data was collected from the Traffic Improvement Association's crash database. Table 2 -1 shows the study intersections and major segments, and the crashes by type and severity. Special attention was given to identify the probable causes for the three fatal crashes and type "A" injury crashes that were identified in the study area. For the intersections, Michigan Department of Transportation's (MDOT) *Michigan Intersection Guide* was used to identify intersections with overrepresented collision patterns. The American Association of State Highway and Transportation Officials' *Highway Safety Manual, 2010,* was used to estimate the impacts of all safety countermeasures.

Table 2-1. Crash Data by Intersection Summary

Intersections	No. of Crashes	No. of Crashes Per Year
Major Intersections		
Dort Highway and Grand Blanc Road	95	19.0
Holly Road and Cook Road	38	7.6
Holly Road and Northbound I-75 Ramps	73	14.6
Holly Road and Southbound I-75 Ramps	62	12.4
Holly Road and Pollock Road	59	11.8
Holly Road and Baldwin Road	53	10.6
Minor Intersections and Roadway Segments	171	34.2
Total	551	110.2

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

The alternatives were found to significantly improve traffic flow over the No-Build Alternative. The traffic analysis report conducted for this EA confirms that two through-lanes are needed to adequately accommodate the 20-year planning horizon traffic demand at a minimum level of service "D" for some intersection movements. The majority of traffic movements will operate at level of service "C" or better. The capacity and traffic flow improvements proposed by MDOT in a separate project (the addition of a northbound loop entrance ramp for Holly Road traffic) will be significantly enhanced with the Dort Highway project to Baldwin Road. With both projects in place, the improvements will eliminate the current "F" level of service for the northbound Holly Road left-turn lane at I-75 in the study area.

Operational analysis conducted during this study indicated that spikes in traffic could be expected when the Genesys Hospital staff changes shifts at 7:00 a.m., 3:00 p.m. and 11:00 p.m. For example, traffic on the southbound I-75 exit ramp peaks at 6:30 a.m. and 6:45 a.m. However, this is a lower overall volume than the morning peak-hour volume for the intersection. These situations were examined with the traffic simulation model to identify critical issues. Future changes in traffic control signals and intelligent transportation system were identified to provide corrective actions for these reoccurring congestion problems.

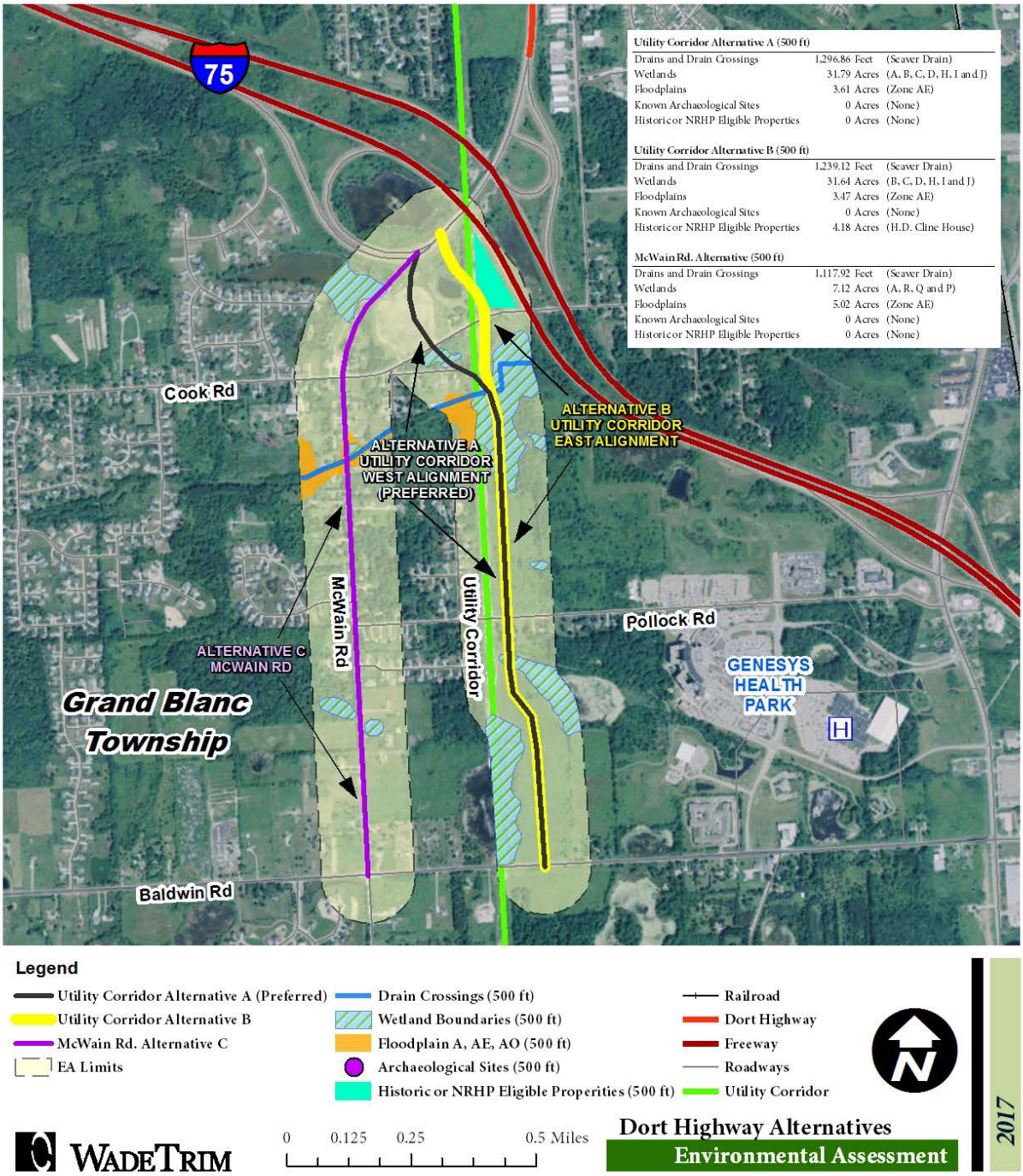
3.0 ALTERNATIVES

The Genesee County Road Commission has considered four alternatives to address the transportation infrastructure and the congestion within the project area. The four alternatives are the No-Build Alternative, Build Alternative A (Utility Corridor with West Alignment), Build Alternative B (Utility Corridor with East Alignment), and Build Alternative C (McWain Road). Each alternative includes the new loop ramp and signal improvements proposed to the I-75/Holly Road (Exit 108) interchange as programmed by the Michigan Department of Transportation (MDOT) The alternatives are not completely within existing right-of-way (ROW). However, Genesys Health Park has agreed to donate a significant section of ROW at no cost for two of the alternatives. The existing McWain Road ROW is insufficient for the corridor extension without acquisition. In each case, additional ROW will need to be acquired to allow for the northern segment's connection to the existing I-75 southbound ramp to Dort Highway.

The County implemented a three-step alternatives evaluation process for screening the alternatives developed early in the planning process and used this process to ultimately determine the refined preferred alternative design concept that is evaluated in this EA. Initially, a broad-range of alternatives were evaluated based on their ability to meet the projects purpose and need and determine if they had a fatal flaw. In the secondary level of evaluation, the three build alternatives that appeared to meet the purpose and need were qualitatively assessed in more detail and compared to identify a preferred alternative. After the secondary evaluation, a Public Workshop was conducted and the Build Alternatives were presented for public review and comment. The comments received at the public hearing and subsequent comments sent in the County through the project website, determined that Build Alternative C (McWain Road) had significant public opposition and was eliminated from consideration.

Each of the alternatives are detailed and explained in the following section.

Figure 3-1. Proposed Dort Highway Alignment Alternatives



3.1 NO-BUILD ALTERNATIVE

The No-Build Alternative is the baseline alternative used to compare traffic flow and impacts with the Build Alternatives. It includes the ramp and signal improvements proposed to the I-75/Holly Road (Exit 108) interchange ramp as programmed by the Michigan Department of Transportation (MDOT) planned to be constructed in 2017. The No-Build Alternative also includes the baseline and projected traffic from developments in the area, but does not include any infrastructure improvements.

The No-Build Alternative does not meet the Purpose and Need of the project. The No-Build Alternative is not considered a reasonable alternative because it does not address the operational deficiencies, safety and access deficiencies of the current year or those expected by the design year. The modeling of this alternative illustrates the continuation of the directional peak period congestion and deterioration of traffic flow in this area through 2040. The results of the capacity analysis for existing conditions indicates that many of the intersections studied have capacities ranging from "A" to "C," which is highly desirable. However, as shown in Table 3-1, one exception is the intersection of Holly and Pollock roads, which has a capacity constraint on the eastbound approach to the intersection. During the morning and afternoon peak hour, the level of service is "F." The problem is due to the high volumes of traffic on Holly Road during the morning, and the high volume of traffic using Pollock Road to go to and from Genesys Health Park. With the new extension, much of this traffic is expected to be diverted to the Dort Highway (Exit 109) interchange.

The major problem that exists for current conditions is the heavy left-turn movement from northbound Holly Road onto the northbound ramp to I-75. Both morning and afternoon peak hours have undesirable levels of service. In view of the ongoing problem, MDOT has developed and obtained approval for constructing a northbound loop ramp to accommodate the left-turn movement. In all remaining sequences of this report, a northbound loop ramp has been added, so the existing capacity problem and delay will not impact the selection of a Preferred Alternative.

If Dort Highway is built on new right-of-way (ROW), it will shift traffic from Holly Road and make traffic operations in the entire study area acceptable for future traffic conditions. The volume levels on all roads would be improved. However, in the No-Build Alternative models, capacities begin to decay, especially on Holly Road. Even with the new northbound loop ramp, several intersections would begin to fail without the relief provided by Dort Highway.

Table 3-1. Existing 2020 Year Intersection LOS - No Build Alternative

Intersection	No Build	
	AM	PM
	Total	Total
Holly Road and Northbound I-75 Ramps	LOS B	LOS C
	15.2	31.5
Holly Road and Southbound I-75 Ramps	LOS D	LOS D
	41.4 9	45.0
Holly Road and EB Pollock Road (Unsignalized)	LOS F	LOS F
	365.1	140.9
Holly Road and Genesys Parkway	LOS A	LOS B
	9.8	15.3
Holly Road and EB Woodbridge Boulevard (Unsignalized)	LOS C	LOS C
	19.9	21.4
Holly Road and Baldwin Road	LOS C	LOS E
	29.2	56.5

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

Note: Assumes that the I-75 and northbound Holly Road loop ramp will be constructed and open to traffic before this project is completed.
Details of the capacity analyses are given in Appendix H.

3.2 BUILD ALTERNATIVES

Even with the proposed loop ramp for the Holly Road interchange, leaving the road network "as is" will not address existing safety and congestion issues for the intersections at Holly and Baldwin roads. While the No-Build Alternative requires no additional ROW or environmental impacts, leaving the transportation infrastructure "as is" leaves the roadway network with failing traffic operations at key intersections at the regional gateway to this growing medical and mixed-use hub. Extending Dort Highway from I-75 to Baldwin Road will provide an alternative route for vehicles accessing Genesys Health Park as well as provide the necessary relief for the Holly Road interchange to operate at an acceptable level of service during the planning horizon of 2040. Therefore, extending Dort Highway as detailed in the Build Alternatives is successful in meeting the Purpose and Need of the project.

3.2.1 Build Alternative A – Utility Corridor with West Alignment (Preferred Alternative)

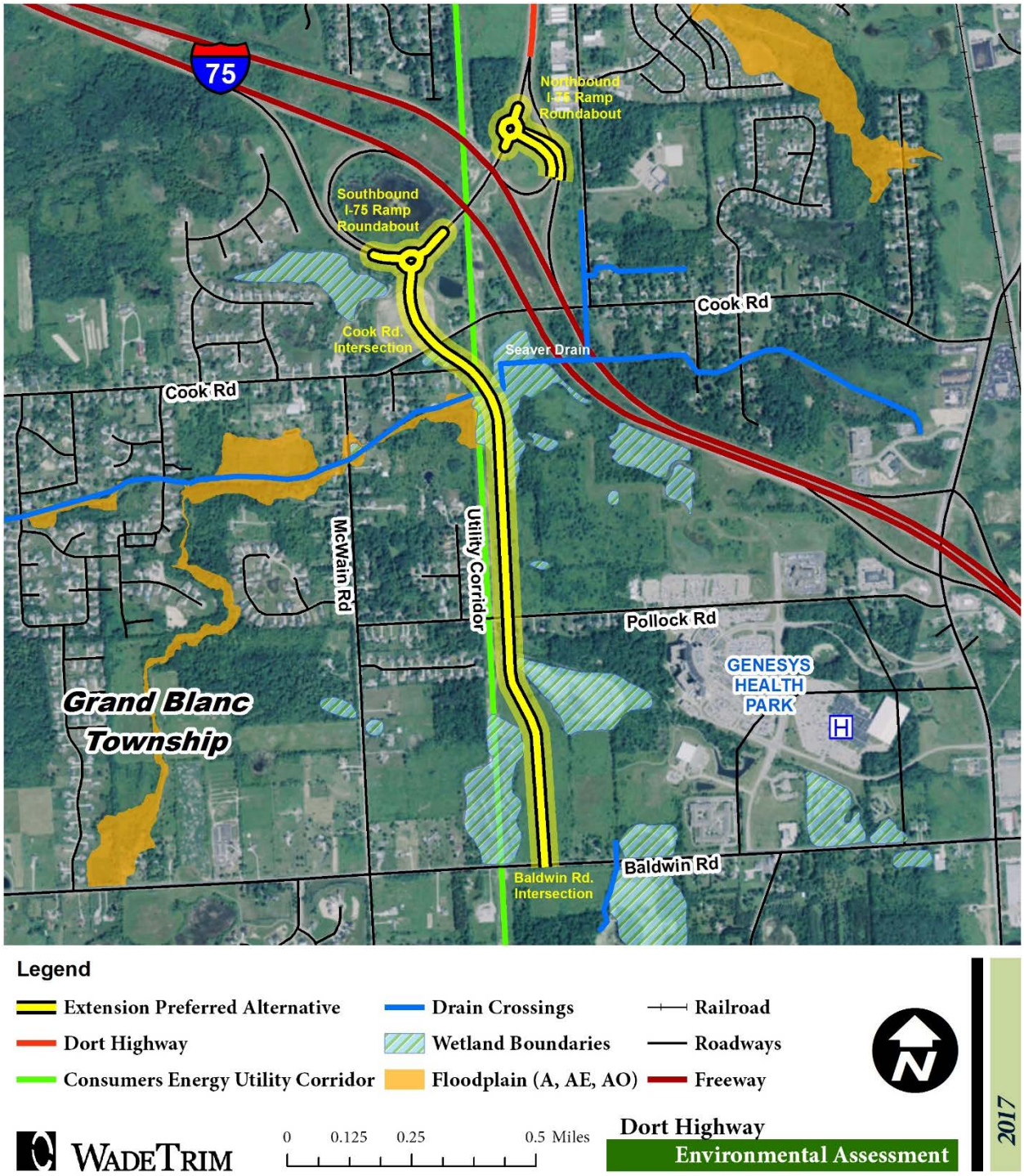
Build Alternative A (Utility Corridor with West Alignment) is the Preferred Alternative and meets all the criteria stated in the Purpose and Need of the project. Because Build Alternative B has design limitations due to bridge proximity and Build Alternative C may result in more community and environmental impacts (discussed subsequently), Build Alternative A is selected as the Preferred Alternative. The Build Alternative A corridor is shown in Figure 3-2. It is proposed to be a two-lane road from the I-75 ramps to the wetlands north of Pollock Road, a two-lane road with a center left-turn lane from the wetlands north of Pollock Road to the Senior Center, and a four-lane boulevard with a grass covered median from the Senior Center to Baldwin Road. Typical proposed road cross sections are provided on page 63, Figure 5-1.

Build Alternative A (Utility Corridor with West Alignment) begins with a roundabout on the west side of I-75, which connects the existing southbound I-75 ramps at Dort Highway (Exit 109). The roundabout is located approximately 500 feet southwest of the existing I-75 bridge. There is also a roundabout on the east side of I-75, which connects the I-75 northbound entrance and exit ramps to Dort Highway. From the roundabout on the west side of I-75, the new Dort Highway extension utilizes a reverse horizontal curve and turns south to cross Cook Road at a 90-degree angle. The roadway continues south beyond Cook Road and parallels the Consumers Energy right-of-way. South of Cook Road, it intersects with Pollock Road, then continues south and ties into Baldwin Road at a 90-degree angle. Intersection configuration at all connection points will be further evaluated and finalized during design.

The proposed roadway will have a bituminous surface, and paved shoulders that drain to side swales to capture drainage from the roadway. Drainage will be directed to stormwater management basins for water quality and volume reductions to meet local and state stormwater management requirements prior to discharges to adjacent water bodies. A box culvert is proposed at the crossing of the Seaver Drain. The final dimensions of this culvert will be developed as part of the final design and permitting for the project.

Build Alternative A (Utility Corridor with West Alignment) will result in impacts to regulated wetlands and a regulated stream (Seaver Drain). Wetlands and Streams are regulated under the Natural Resources and Environmental Protection Act (1994 P.A. 451, Part 303, Wetland Protection and Part 301, Inland Lakes and Streams, as well as the Genesee County Drain Commissioner. Permits for impacts to regulated wetlands and stream are administered by the Michigan Department of Environmental Quality (MDEQ).

585 Figure 3-2. Build Alternative A – Utility Corridor with West Alignment (Preferred Alternative)
586 and Roundabouts at I-75 Ramps

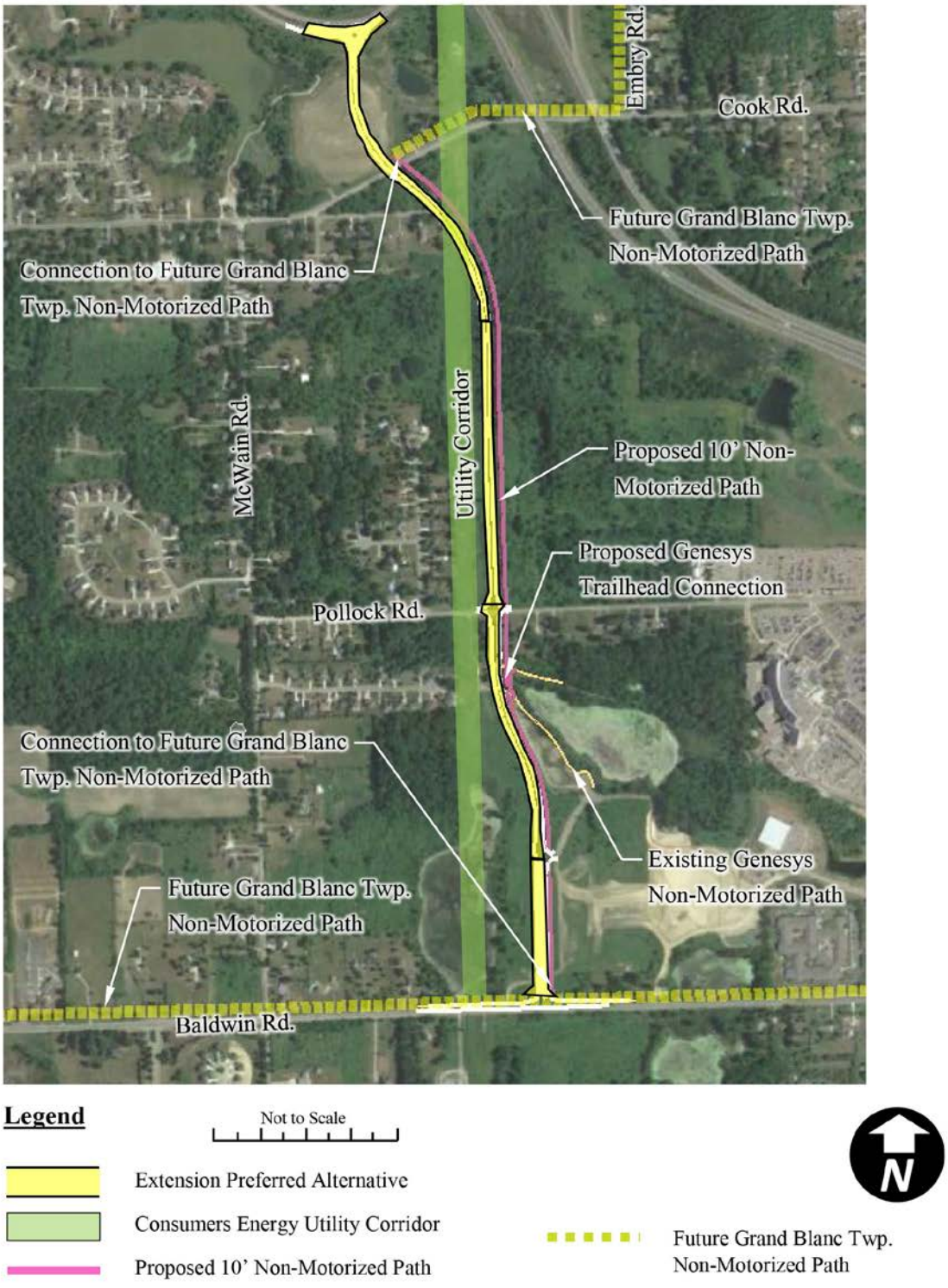


587

The wetlands impacted are characterized as scrub-shrub/emergent wetlands with evidence of historic anthropogenic impacts resulting from previous agricultural practices at the site. None of the impacts are expected to be significant in terms of wetland quality or wildlife habitat. During permitting and final design, the road commission will need to address avoidance and minimization of these impacts and demonstrate the selection of the most prudent and feasible method to construct the roadway across these wetlands and stream. Compensation for direct and indirect impacts will be required and are expected to be detailed in the final permit conditions during final design and permitting. A more detailed description of the wetlands evaluated is provided in Section 6 of this document.

A 10-foot wide, shared-use non-motorized path will be constructed on the east side of the Preferred Alternative (Build Alternative A), from Cook Road to Baldwin Road, and connected to the existing Genesys Health Park trail system on the east side of the Preferred Alternative just south of Pollock Road. A new trailhead connection is also proposed in conjunction with the Preferred Alternative. The non-motorized path associated with the Preferred Alternative also includes potential connections to the future Grand Blank Township non-motorized path at Cook Road (at the north) and Baldwin Road (to the south). Typical proposed road sections that include the non-motorized path are provided in Figure 5-1. The proposed location of the non-motorized path is shown in Figure 3-3.

605 Figure 3-3. Proposed Non-Motorized Path Location and Potential Connections



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Property for ROW will need to be acquired south of the connection to I-75 for that portion of the proposed roadway extending south past the intersection with Cook Road then crossing southeast across the Consumers Energy ROW. From that point south, all ROW will be donated by Genesys Health Park and sufficient ROW will be transferred to the county to construct the roadway and land areas required for stormwater management/wetland compensation.

Build Alternative A (Utility Corridor with West Alignment) is selected as the Preferred Alternative in preference to the design limitations of Build Alternative B (Utility Corridor with East Alignment) and the potential community and environmental impacts of Build Alternative C (McWain Rd.), which are discussed subsequently. The total estimated cost of the Preferred Alternative (Build Alternative A) is $13,681,265 and is detailed in Section 8 of this document.

3.2.2 Build Alternative B – Utility Corridor with East Alignment

Build Alternative B (Utility Corridor with East Alignment) is a slight variation on Build Alternative A, in that the extension of Dort Highway would also begin on the west side of I-75 but would instead begin east of the connection to the ramp proposed in Build Alternative A. The extension would then proceed to the southeast and intersect with Cook Road east of the intersection proposed for Build Alternative A. At this point, the road extension would curve south and connect at the same location as proposed for Build Alternative A. Impacts of Build Alternative B are identical as those resulting from Build Alternative A except as noted in the subsequent analyses.

The problem with Build Alternative B (Utility Corridor with East Alignment) is designing the intersection near the bridge carrying Dort Highway over I-75. The alignment of the existing northbound ramps and bridge is based on a horizontal curve to the left which was a good design practice at that time. However, to use the existing bridge and most of the existing ramps to fit the proposed connection to Baldwin Road is problematic. Using a roundabout or stop-controlled intersection means it must tie into Dort Highway on the high side of the horizontal curve, then transition downhill to tie into the intersection of nearby Cook Road. This design produces driver reaction time issues due to the limited sight distance of the intersection created by the horizontal and vertical alignment and the bridge railings.

Build Alternative B (Utility Corridor with East Alignment) was not selected as the preferred alternative due to the issues related to the proximity of the bridge as previously noted.

3.2.3 Build Alternative C – McWain Road

Build Alternative C (McWain Road) includes extending Dort Highway south and west to intersect with the existing ROW for McWain Road south of Cook Road. Based on input from the affected community, this alternative is least desirable due to increased ROW needs, potential traffic and noise, and possible wetland impacts when contrasted with either Build Alternative A or Build Alternative B (Utility Corridor alignments). These impacts are greater for Build Alternative C due to the proximity of the established residential community along McWain Road. Due to the number and location of homes near McWain Road, this alternative was modelled as a two-lane road with a center left-turn lane throughout the termini of the project.

For Build Alternative C (McWain Road), property would need to be acquired at the northern end of the extension to make the connection to the existing ramp. The road section would be similar to the Build Alternative A (Utility Corridor with West Alignment). The McWain Road ROW varies in width south of the Cook Road/McWain Road Intersection. Additional ROW will be needed where existing ROW is insufficient. Also, grading easements will be required throughout this area of the alignment.

Build Alternative C (McWain Road) will cause impacts to regulated wetlands and a regulated stream (Seaver Drain). Wetlands and streams are regulated under the Natural Resources and Environmental Protection Act (1994 P.A. 451, Part 303, Wetland Protection and Part 301, Inland Lakes and Streams, as well as the Genesee County Drain Commissioner. Permits for impacts to regulated wetlands and stream are administered by the MDEQ. The wetlands impacted are characterized as scrub-shrub/emergent wetlands with evidence of historic anthropogenic impacts resulting from previous agricultural practices at the site. None of the impacts are expected to be significant in terms of wetland quality or wildlife habitat. During permitting and final design, the road commission will need to address avoidance and minimization of these impacts, and demonstrate the selection of the most prudent and feasible method to construct the roadway across these wetlands and stream. Compensation for direct and indirect impacts will be required and are expected to be detailed in the final permit conditions during final design and permitting. A more detailed description of the wetlands evaluated is provided in Section 6 of this document.

After the review of the public comments received at the Public Workshop held June 30, 2016, and further evaluation of the social, environmental and economic impacts of this alternative during preparation of the EA; the road commission has determined Build Alternative C (McWain Road) to have a fatal flaw due to the

numerous potential impacts to the affected community and environment that could not be adequately resolved to advance this alternative to implementation. These potential impacts include substantial ROW acquisition; altered drainage; increased traffic and vehicle speed; amplified noise levels; diminished privacy; aesthetic concerns; and possible loss of mature trees and wetlands. Therefore, Build Alternative C will not be further considered as a viable alternative.

675 Table 3-2. Summary of All Impacts of Build Alternatives

Impact	Alternative A Utility Corridor West Alignment (Preferred)	Alternative B Utility Corridor East Alignment	Alternative C McWain Road
Length (miles)	1.65	1.61	1.65
Wetland Impacts (acres)	4.65	6.2	0.43
Right-of-Way Impacts	Full: 6; Partial: 2	Full:3, Partial:2	Full:0, Partial: 53
Residential Displacements	3	3	3
Agricultural Displacements	0	0	0
Major Stream Crossings (Seaver Drain)	1	1	1
Floodplain Impacts (cubic yards)	15,100	15,400	900
Environmental Justice Impacts	0	0	0
Noise Impacts	4	3	6
Potential Historic Properties Impacts (number)	0	1	0
Natural Area Sites (number)	0	0	0
Threatened (T) and Endangered (E) Species (number)	1E, 3T	1E,3T	1E,3T
Potential Contaminated Sites (number)	0	0	0
Total Costs ($ Millions, 2016 dollars)	$16.87M	$16.67M	$18.84M

676 *Source: Rowe Professional Services Firm and Wade Trim Associates, Inc.*

677

678 Table 3-3. Right-of-Way Impacts of Build Alternatives

Impacts	Alternative A Utility Corridor West Alignment (Preferred)	Alternative B Utility Corridor East Alignment	Alternative C McWain Road
ROW Impacts	8	5	53
Total Fee Take	10.94 acres	4.5 acres	6.11 acres
Displacement	3	3*	3
Grading Easements	1.48 acres	1 acre	1.1 acres
	1	1	56
Donated	18.38 acres	31.55 acres	N/A

679 **Impacted property on north end is historic, tie-in too close to bridge*

4.0 TRAFFIC

As previously mentioned, the Genesee County Road Commission (GCRC) is considering extending Dort Highway from the current interchange with I-75 (Exit 109) south to Baldwin Road. From I-75 to the north, M-54/Dort Highway is a state trunkline highway. An aerial view of the Dort Highway corridor and surrounding road network, located in Grand Blanc Township, is shown in Figure 4-1.

The study limits, as defined by the Michigan Department of Transportation (MDOT) and the Federal Highway Administration (FHWA), include I-75 from the merge/diverge points on I-75 north of Holly Road to the merge/diverge points south of I-475. To the east along Holly Road, the limits run from the intersection of East Cook Road south to Baldwin Road. To the south along Baldwin Road, the limits run from Holly Road west to McWain Road. On the western side along McWain Road, the limits run from Baldwin Road north to East Cook Road. Due to the size of Genesys Health Park's development, the study area also includes Pollock Road, Genesys Parkway, and Health Park Boulevard. The Dort Highway section studied includes the intersection of Grand Blanc Road, the interchange of I-75, and Baldwin Road. South of I-75, the Dort Highway study also included the proposed new intersections of Cook, Pollock and Baldwin roads.

This section of the report outlines the study that was conducted and the alternatives examined, specifically the Preferred Alternative. The accompanying Synchro traffic simulation models were used to quantify traffic flow for the 2015 existing road and traffic conditions, the planned build-out of the Genesys Health Park and new Dort Highway extension in 2020, and for conditions in the 2040 design year. The difference in traffic conditions between 2020 and 2040 provides a best estimate of the overall impacts of each alternative.

Figure 4-1. Dort Highway Study Area

4.1 OBJECTIVES AND SCOPE

The objectives of this study are to quantify the existing and future levels of traffic service on Dort Highway for morning and afternoon peak hour conditions, and to examine alternatives that could be employed to provide a connection between the existing Dort Highway interchange and Baldwin Road. The traffic analysis resulted in the selection of the Preferred Alternative.

In formulating the study scope, the objectives and methodology was discussed with the GCRC engineers and planners as well as MDOT officials. It was mutually decided that the scope of the study would include the following activities:

- Obtain traffic volumes, directional turning movements, traffic signal timing and geometric data at the following intersections:
    - Dort Highway and Grand Blanc Road
    - Dort Highway and Northbound I-75 Ramps
    - Dort Highway and Southbound I-75 Ramp
    - McWain Road and Cook Road
    - McWain Road and Pollock Road
    - McWain Road and Baldwin Road
    - Baldwin Road and Health Park Boulevard
    - Baldwin Road and Halsey Road
    - Baldwin Road and Holly Road
    - Holly Road and Woodbridge Boulevard
    - Holly Road and Genesys Parkway
    - Holly Road and Pollock Road
    - Holly Road and Southbound I-75 Ramps
    - Holly Road and Northbound I-75 Ramps
    - Holly Road and East Cook Road
    - Holly Road and West Cook Road
    - Cook Road and Embury Road
    - Health Park Boulevard and Woodridge Boulevard
    - Health Park Boulevard and Genesys Parkway
    - Pollock Road and Health Park Boulevard

- Perform a crash analysis using the last five years of crash data to identify all existing safety-related problems including intersections, high crash locations, and locations or road sections with abnormally high collision types, and crash severity.
- Generate peak-hour trips for the planned and proposed developments based on the Institute of Transportation Engineers (ITE) report, *Trip Generation, Ninth Edition, 2012*.
- Use the directional distribution of existing traffic on Dort Highway and Genesys Health Park during the peak traffic hours to estimate trip distribution and assignment of peak-hour traffic through the highway system.
- Conduct intersection capacity analysis to determine the existing levels of traffic service in 2015, and levels of service based on the additional trips and growth in background traffic generated by the proposed developments for the build-out years of 2020 and 2040.
- Conduct operational analyses using Synchro 9 and SimTraffic to identify any traffic flow problems such as excessive queues, unexpected conflicts, etc., and to estimate traffic performance measures for each alternative.

4.2 STUDY PROCEDURE

To achieve the objectives and scope, the study involved the collection and analysis of geometric, traffic control, and traffic volume data for the intersections within the Dort Highway study corridor. The data collection effort and the analysis procedures are summarized in the following paragraphs.

4.2.1 Data Collection

Data collection included field reviews of the study area, identification of the planned and expected highway improvements and development along Dort Highway, manual collection of directional vehicle turning movements and truck counts for morning and afternoon peak periods, and collection and analysis of crash data.

Because the study did not receive approval to begin before June 2015, manual directional turning movements were obtained at all major study intersections during July and August 2015. The morning peak hour was collected from 7:00 a.m. to 9:00 a.m. and afternoon peak hour from 4:00 p.m. to 6:00 p.m. Some of the counts near the Holly Road interchange and entrances to Genesys Hospital were counted from 6:30 a.m. to include the change in hospital shift work for the 7:00 a.m. shift.

Counts were also taken at Holly Road and East Cook Road, Holly Road and Baldwin Road, and Dort Highway and Grand Blanc Road when school was in session during September to validate the traffic volumes. This data was used to increase the expected 2015 hourly counts at all project intersections to accommodate school hour volumes. The directional turning movement data are summarized in Appendix E.

Field observations and measurements of the cycle length, signal phasing, green and amber times, queuing, etc. were made and recorded by the project team. The existing timing permits for the signalized intersections were obtained from the GCRC.

To examine the crash history of the study area, crash data were obtained from the Traffic Improvement Association's Traffic Crash database. The tool (TCAT 2.0) was used to extract the data and examine it. The crash data covered the six-year period of January 1, 2010, to December 31, 2015.

4.2.2 Analysis Procedures

Estimates of future traffic volumes, along with trips generated by the proposed developments, were made using the data and procedures contained in the ITE report, *Trip Generation, Ninth Edition, 2012*. In addition, the methodology used to estimate and distribute the trips along Dort Highway is explained in the analysis section of this report.

Highway capacity analyses were conducted to identify deficient intersections and determine road improvements that provide adequate capacity. The intersection capacity analyses were used to determine the existing levels of service and the level of service due to background growth in traffic as well as traffic generated by the proposed development. Capacity analyses were also conducted for the 2020 and 2040 conditions.

Synchro 9 (Version 9.1, Build 912, Revision 4) and SimTraffic were used to conduct the traffic operations analyses. The capacity worksheets are shown in Appendices F through J.

4.2.3 Use of Genesee County Metropolitan Planning Commission Travel Demand Model

The traditional method of conducting transportation impact analysis for site development is to do the following:

- Generate trips using the ITE Trip Generation data or studies that establish trip generation rates for specific land uses.
- Estimate background traffic growth in the area.
- Distribute trips to the area network based on origin-destination data or assuming that the trips will be made in proportion to the current volumes on the network.

This process works well for frequently occurring land use types, sites with a limited number of travel routes and where the build-out horizon is short (i.e., preferably less than five years). Estimating and distributing trips for the Dort Highway project does not fit well within this methodology as the project design year is 20 years in the future. In view of the limitations with the traditional methods, it was decided by Wade Trim to contact the GCRC to investigate the use of their travel demand model for this study. The model is used to evaluate future travel forecasts and transportation improvements for the Genesee County area.

The Travel Demand Model (TDM) is a planning tool that is used to evaluate the existing transportation system and predict the impacts of future growth. The model simulates existing road conditions and traffic demand on the roads and intersections. The model has the capability of mode-split (i.e., using vehicle and transit modes). Inputs include the road network, socioeconomic data and regional travel surveys to simulate existing conditions.

Advantages of using the TDM include the fact that it takes into account the impact of other economic and employment changes in the region, which may be outside of the study area. Often called background traffic, it takes into consideration other improvements in the transportation system. Furthermore, as trip distribution is based on the capacity of the transportation link or intersection, as maximum capacity is reached, trips are assigned to other routes. This is the practice normally selected by motorists.

As desirable as it appears, Genesee County's TDM could not be used to estimate trips over time for this project. The planners did run the models and input other road improvements expected in the area by 2020 (projects included in the Transportation Improvement Program (TIP)) to estimate morning and afternoon peak trips at each study intersection in 2020. Finally, they input the TIP projects expected to be constructed by 2042 and provided the number of morning and afternoon peak-hour trips at each study intersection.

Trip estimates were made assuming two outcomes: trips with no road improvements (i.e., No-Build Alternative) and trips with the new Dort Highway project with road improvements (i.e., Build Alternatives). However, upon analyzing the results, the data were highly inconsistent and considered not usable. Further investigation revealed that the base line counts for the existing TDM were based on 2005 data and have not been revisited. The model is currently under revision to correct this deficiency, but it will not be completed for another year. As a result, the traditional method of using the ITE methodology to conduct the site analysis was used.

4.3 Study Area

Dort Highway runs from the existing I-75 interchange north through I-69 and I-475 interchanges to the intersection of M-83 (Birch Run Road). The study limits, as defined by MDOT and FHWA, are from the existing I-75 interchange (Exit 109) south to Baldwin Road.

4.3.1 Existing Dort Highway Project Conditions

The existing roadways in the project area vary as follows:

- Dort Highway – In the project area, Dort Highway is a four-lane section with two through-lanes in each direction. The posted speed limit is 55 miles per hour (mph). The average daily traffic (ADT) on Dort Highway is 13,300 vehicles per day.
- Holly Road – The nearest interchange south of Dort Highway is Holly Road (Exit 108). It is a five-lane section with two through-lanes in each direction and a center two-way left turn lane. The posted speed limit is 45 mph. The ADT on Holly Road is approximately 22,000 vehicles per day.
- Baldwin Road – This is a two-lane section with one through-lane in each direction. The posted speed limit is 35 mph. The ADT on Baldwin Road is approximately 11,200 vehicles per day.
- McWain Road – This is a gravel road with one through-lane in each direction of travel. The posted speed limit is 30 mph, and the ADT on McWain Road is less than 1,000 vehicles per day.

4.4 Safety Analysis

To achieve the study's objectives, the effort involved the collection and analysis of crash data for the Dort Highway study area intersections. The data collection effort and the analysis procedures are summarized in the following paragraphs.

4.4.1 Data Collection

To examine the crash history of the corridor, police crash data were obtained from Traffic Improvement Association's statewide database for the five-year period, January 1, 2011, to December 31, 2015.

4.4.2 Analysis Procedures

The crash analysis was conducted to identify and quantify crash patterns such as collision type, severity, environmental conditions, contributing factors, and other crash characteristics. Crashes were sorted by location using the MDOT Physical Reference numbers for intersecting roadways and crossovers, and by MDOT's mile point designations.

The following crash analyses were performed:

1. Corridor Crashes: The 551 crashes that occurred within the study area during the five-year study period were analyzed. The crashes were summarized by collision type, severity, year, day of week, weather condition, lighting condition and pavement condition.
2. Major Intersection Crashes: Crashes that occurred at the major signalized intersections within the study area were analyzed. Crashes were summarized by type, severity and direction. The major intersections with the highest crash frequencies include:
    - Dort Highway and Grand Blanc Road
    - Holly Road and Cook Road
    - Holly Road and Northbound I-75 Ramps
    - Holly Road and Southbound I-75 Ramps
    - Holly Road and Pollock Road
    - Holly Road and Baldwin Road
3. Fatal Crashes: All crashes involving a fatality were analyzed.

It is important to note that the Preferred Alternative for the Dort Highway extension is on new alignment, thus there are no crashes to report until the section is constructed. The reason for conducting the crash analysis is to determine if there are any crash problems with the proposed connections. As expected, the major collision intersections occurred on Holly Road. Under the "Do Nothing" scenario, crashes would be expected to increase over time. However, under the new interchange configurations, crashes would most likely remain the same.

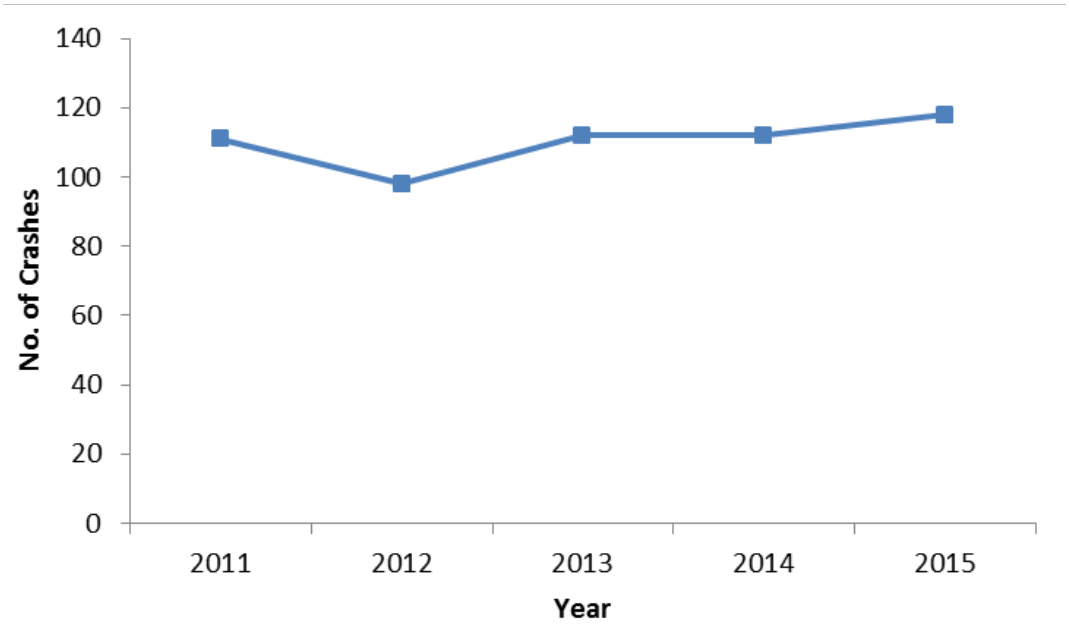
4.4.3 Analysis

The results of the crash analyses, which were conducted to identify and quantify crash patterns such as collision type, severity, environmental conditions, contributing factors, and other crash characteristics, are presented in this section of the report.

4.4.4 Corridor Crashes

Throughout the entire study area, there were 551 recorded crashes in five years, or 110.2 crashes per year. Figure 4-2 shows the number of crashes per year in the study area. Over the five-year period, the number of crashes was fairly stable meaning that the number of crashes did not vary much from year to year.

Figure 4-2. Number of Crashes by Year in the Study Area



Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

As shown in Table 4-1, the most prominent crash type was rear end collision. A total of 218 (39.6%) of the collisions were rear end. Most of the collisions on the section were from intersections and many of the intersections were signalized making this result expected.

While many of the intersection collisions follow expected patterns, the 196 collisions that occurred on wet or snowy roads are higher than expected for similar facilities. This could be a general condition due to the lack

of resurfacing in recent years, which is related to the economic recession that began in 2008. A review of each intersection was calculated to see if this pattern continues or if it is related to just a few specific intersections.

Table 4-1. Crash Types and Characteristics on the Study Area Roadways

Crash Type	No. of Crashes	Percentage	No. of Crashes Per Year
Rear End	218	39.6%	43.6
Angle	82	14.9%	16.4
Head-on	6	1.1%	1.2
Head-on / Left-turn	68	12.3%	13.6
Sideswipe / Same Direction	61	11.1%	12.2
Sideswipe / Opposite Direction	8	1.5%	1.6
Single Vehicle	96	17.4%	19.2
Other	12	2.2%	2.4
Total	551	100%	110.2
Injury	127	23%	25.4
Snowy / Icy / Wet Road Conditions	196	35.6%	39.2
Nighttime	129	23.4%	25.8

Source: Dort Highway Transportation Study, 2016, Wade Trim Associates, Inc.

4.4.5 Major Intersection Crashes

The major intersections with the highest number of crashes are at the following locations.

- Dort Highway and Grand Blanc Road
- Holly Road and Cook Road
- Holly Road and Northbound I-75 Ramps
- Holly Road and Southbound I-75 Ramps
- Holly Road and Pollock Road
- Holly Road and Baldwin Road

Dort Highway and Grand Blanc Road

Table 4-2 shows the number of crashes that occurred at the signalized intersection of Dort Highway and Grand Blanc Road. The predominant crash types were rear end crashes (32.6%) and head-on/left turn

(30.5%). There were thirty-three injury crashes, with one involving the most serious injury type, Type A Incapacitating Injury, and ten involving Type B, Possible Incapacitating Injury.

The last column of the table shows peer group average crash types per year taken from MDOT's *Michigan Intersection Guide, July 2008, page 58*. The crash types shown in red indicate that these crashes exceed the average based on crashes reported at similar intersections. As shown in Table 4-2, rear end, head-on/left turn, total and injury crashes are all much greater than the peer group averages.

Table 4-2. Crash Types and Characteristics for Dort Highway and Grand Blanc Road

Crash Type	No. of Crashes	Percentage	No. of Crashes Per Year	Peer Group Crashes Per Year
Rear End	31	32.6%	6.2	2.63
Angle	15	15.8%	3.0	1.91
Head-on / Left-turn	29	30.5%	5.8	0.38
Sideswipe / Same Direction	9	9.5%	1.8	0.77
Sideswipe / Opposite	3	3.2%	0.6	0.20
Single Vehicle	6	6.3%	1.2	0.21
Other	2	2.1%	0.4	0.00
Total	95	100%	19.0	7.30
Injury	33	34.7%	6.6	1.85
Snowy / Icy / Wet Road Conditions	35	36.8%	7.0	1.65
Nighttime	25	26.3%	5.0	1.93

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

Note: Values in red indicate the crash type has a higher frequency than is expected at similar locations.

Holly Road and Cook Road

Table 4-3 shows the number of crashes that occurred at the signalized intersection of Holly Road and Cook Road. The predominant crash type was rear end (68.4%) and angle crashes (15.8%). There were six injury crashes (15.8%), one Type B and five Type C. The crashes on snowy, icy or wet pavement is below that found on similar roads.

The last column of the table shows peer group average crash types per year taken from MDOT's *Michigan Intersection Guide, July 2008, page 60*. All of the crash types at the intersection are below the values found at similar intersections.

Table 4-3. Crash Types and Characteristics for Holly Road and Cook Road

Crash Type	No. of Crashes	Percentage	No. of Crashes Per Year	Peer Group Crashes Per Year
Rear End	26	68.4%	5.2	8.88
Angle	6	15.8%	1.2	3.58
Sideswipe / Same Direction	2	5.3%	0.4	1.45
Head-on / Left-turn	2	5.3%	0.4	1.01
Single Vehicle	2	5.3%	0.4	0.06
Total	38	100%	7.6	17.32
Injury	6	15.8%	1.2	3.79
Snowy / Icy / Wet Road Conditions	10	26.3%	2.0	4.42
Nighttime	8	21.1%	1.6	4.22

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

Holly Road and NB I-75 Ramps

Table 4-4 provides the number of crashes that occurred at the signalized intersection of Holly Road and northbound I-75 ramps. The predominant crash types were rear end crashes (58.9%) and angle crashes (12.3%). There were twelve injury crashes with two involving the most serious injury type, Type A Incapacitating Injury, and two involving Type B, Possible Incapacitating Injury.

Analysis of the crashes by type revealed that many of the crashes were related to the large queues and delays caused by vehicles making a left turn from Holly Road onto the northbound ramp to I-75. This is a high-volume, left-turn movement, that has been studied by MDOT (*Justification for Modifying the Interchange at I-75 and Holly Road, December 2015*). During 2016, MDOT was notified by FHWA that their study was approved. Current plans are to install a northbound loop ramp from northbound Holly Road onto I-75 in 2017.

Based on the MDOT study and decision to make road improvements, a left-turn loop ramp from Holly Road to northbound I-75 was added to all the models used in the subsequent analyses.

Notice the number of crashes on snowy, icy, or wet pavement at this intersection is above the number expected at similar intersections. As part of the road improvement, some of the pavement on Holly Road will be resurfaced to help reduce wet pavement crashes. In addition, the large number of vehicles using the new loop ramp will aid in reducing the long queues and delay, and assist in reducing wet pavement crashes.

Table 4-4. Crash Types and Characteristics for Holly Road and Northbound I-75 Ramps

Crash Type	No. of Crashes	Percentage	No. of Crashes Per Year	Peer Group Crashes Per Year
Rear End	43	58.9	8.6	8.88
Angle	9	12.3	1.8	3.58
Sideswipe / Same Direction	6	8.2	1.2	1.45
Head-on / Left-turn	6	8.2	1.2	1.01
Single Vehicle	6	8.2	1.2	0.06
Other	3	4.1	0.6	0.00
Total	73	100	14.6	17.32
Injury	12	16.4	2.4	3.79
Snowy / Icy / Wet Road Conditions	26	35.6	5.2	4.42
Nighttime	10	13.7	2.0	4.22

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

Note: Values in red indicate the crash type has a higher frequency than is expected at similar locations.

Holly Road and Southbound I-75 Ramps

Table 4-5 shows the number of crashes that occurred at the signalized intersection of Holly Road and the southbound I-75 ramps. The predominant crash types were rear end (56.5%) and sideswipe/same direction (14.5%). There were ten injury crashes, with three involving Type B, Possible Incapacitating Injury.

None of the crash types exceeded the number expected at similar locations except for the snowy, icy and wet pavement crashes. The number of snowy, icy and wet pavement crashes at this intersection are above the number expected at similar intersections.

Table 4-5. Crash Types and Characteristics for Holly Road and Southbound I-75 Ramps

Crash Type	No. of Crashes	Percentage	No. of Crashes Per Year	Peer Group Crashes Per Year
Rear End	35	56.5	7.0	8.88
Angle	7	11.3	1.4	3.58
Sideswipe / Same Direction	9	14.5	1.8	1.45
Head-on / Left-turn	7	11.3	1.4	1.01
Single Vehicle	4	6.5	0.8	0.06
Total	62	100	12.4	17.32
Injury	11	17.7	2.2	3.79
Snowy / Icy / Wet Road Conditions	26	41.9	5.2	4.42
Nighttime	15	24.2	3.0	4.22

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

Note: Values in red indicate the crash type has a higher frequency than is expected at similar locations.

Holly Road and Pollock Road

Table 4-6 shows the number of crashes that occurred at the unsignalized intersection of Holly Road and Pollock Road. The predominant crash types were angle (33.9%) and rear end (33.9%). There were twelve injury crashes with none involving the most serious injury type, Type A Incapacitating Injury, and three involving Type B, Possible Incapacitating Injury.

Pollock Road is a major feeder of traffic to and from Genesys Health Park. The overrepresented number of angle and head-on/left-turn crashes indicates that a crash problem is materializing at this location. Having another I-75 connection to Dort Highway will reduce the number of vehicles using this intersection, which should reduce the crash potential and number of crashes.

Table 4-6. Crash Types and Characteristics for Holly Road and Pollock Road

Crash Type	No. of Crashes	Percentage	No. of Crashes Per Year	Peer Group Crashes Per Year
Angle	20	33.9	4.0	3.58
Rear End	20	33.9	4.0	8.88
Head-on / Left-turn	10	16.9	2.0	1.01
Sideswipe / Same Direction	5	8.5	1.0	1.45
Sideswipe / Opposite Direction	3	5.1	0.6	0.29
Single Vehicle	1	1.7	0.2	0.30
Total	59	100	11.8	17.32
Injury	12	20.3	2.4	3.79
Snowy / Icy / Wet Road Conditions	17	28.8	3.4	4.42
Nighttime	9	15.3	1.8	4.22

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

Note: Values in red indicate the crash type has a higher frequency than is expected at similar locations.

Holly Road and Baldwin Road

Table 4-7 shows the number of crashes that occurred at the signalized intersection of Holly Road and Baldwin Road. The predominant crash types were rear end (32.1%) and angle (22.6%). There were twelve injury crashes with none involving the most serious injury type, Type A Incapacitating Injury, and three involving Type B, Possible Incapacitating Injury.

The head-on/left-turn crashes appear to be related to the permissive left turns permitted at the intersection. In particular, the eastbound Baldwin Road left turns onto Holly Road northbound appear to be increasing. It is possible that it is getting near the time when a flashing yellow arrow should be considered at this intersection to reduce these crashes. The flashing yellow arrow provides permissive as well as protected left turns. No other crash types were identified as being abnormal at this location.

Table 4-7. Crash Types and Characteristics for Holly Road and Baldwin Road

Crash Type	No. of Crashes	Percentage	No. of Crashes Per Year	Peer Group Crashes Per Year
Rear End	17	32.1%	3.4	8.88
Angle	12	22.6%	2.4	3.58
Head-on	1	1.9%	0.2	0.16
Head-on / Left-turn	11	20.8%	2.2	1.01
Sideswipe / Same Direction	9	17.0%	1.8	1.45
Single Vehicle	3	5.7%	0.6	0.06
Total	53	100%	10.6	17.32
Injury	12	22.6%	2.4	3.79
Snowy / Icy / Wet Road Conditions	15	28.3%	3.0	4.42
Nighttime	18	34.0%	3.6	4.22

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

Note: Values in red indicate the crash type has a higher frequency than is expected at similar locations.

Crash Summary

The study area generally has a low frequency of crashes. While the number of crashes on the surface streets showed no fatal crashes, there were two fatalities on I-75. There was a fatal crash on I-75 in June 2014 in daylight conditions and on dry pavement. An intoxicated driver changed three lanes on northbound I-75 at a high rate of speed, lost control of the vehicle and crashed into a pier on the Dort Highway overpass. There was also a fatal crash on I-75 in September 2012 at nighttime and on dry pavement. A vehicle was traveling on northbound I-75 in a construction zone. The driver went to use his/her cell phone and took their eyes off the road. When they looked up, they saw that traffic had stopped for construction, but the driver did not have enough time to brake and crashed into the vehicle ahead of them.

There were no pedestrian or bicycle crashes in the study area. This is primarily due to the absence of sidewalks and bike lanes. In future evaluations, sidewalks and bike lanes will be considered in developing the Dort Highway project.

The high incident of crashes on snowy, icy, or wet pavement appears concentrated at two intersections. Both the northbound and southbound ramps have a higher than normal number of inclement weather

crashes which are related to the large left-turn demand for traffic on northbound Holly Road who want to travel northbound on I-75. As mentioned, a project to eliminate this left-turn situation and provide a right-turn loop ramp is being undertaken by MDOT and will be constructed in 2017.

4.5 TRAFFIC ANALYSIS

The purpose of the traffic analysis was to quantify the existing and future levels of service on the corridor for both morning and afternoon peak hours, and to examine the impacts of alternatives. To quantify the level of traffic service and develop traffic performance measures for the corridor, traffic simulation models were prepared using Synchro Studio Version 9.1, build 912, revision 4. The basic Synchro traffic flow models were first developed and validated for existing conditions, then utilized to evaluate the impacts of alternative road designs which included future land-use and baseline traffic volume increases in the corridor.

The operational analyses were conducted in accordance with the practices and requirements of MDOT and Genesee County. The primary publication utilized was the MDOT *Electronic Traffic Control Device Guidelines, revised November 30, 2016*. The capacity analyses were conducted in accordance with the *2000, 2010 and 2016 Highway Capacity Manual* methodology. The tasks; trip generation, assignment, and distribution of trips on the road network were conducted in accordance with standard ITE publications entitled *Trip Generation Manual and Trip Generation Handbook*.

When the initial alignment of the Dort Highway extension was prepared, stop-controlled intersections were placed at the connection between the I-75 north and southbound ramps and Dort Highway. Upon reviewing the plan and following a review of the traffic performance measures for the intersections, the county officials suggested the use of roundabouts for these two connections. In the subsequent analyses, Alternative 1 includes Roundabouts at the ramp terminals and Dort Highway. Alternative 2, contains Stop signs placed at the intersections of the I-75 ramps and Dort Highway, as well as Stop signs at the intersections of Cook Road, Pollock Road, and Baldwin Road. The results of the traffic analyses were used to support the preferred alternative which is further explained in this section.

Utilizing traffic turning movement counts taken in August 2015 and modified to include school traffic, Synchro 9 traffic simulation models for the morning and afternoon peak hours were developed for the following conditions:

- 2015 Existing Conditions
- 2020 Build-Out Conditions with Dort Highway
    - Alternative A and B – Roundabouts
    - Alternative A and B – Stop Controlled Intersections
    - Alternative C McWain Road – Roundabouts
    - Alternative C McWain Road – Stop Controlled Intersections
- 2020 Build-Out Conditions without Dort Highway
- 2040 Build-Out Conditions with Dort Highway
    - Alternative A and B – Roundabouts
    - Alternative A and B – Stop Controlled Intersections
    - Alternative C McWain Road – Roundabouts at the I-75 Ramps
    - Alternative C McWain Road – Stop Controlled Intersections
- 2040 Build-Out Conditions without Dort Highway

The 2015 existing conditions models were developed and validated for weekday morning and afternoon peak hours. Validation of the models included comparing the traffic volumes produced by simulation with the actual volumes recorded at the intersections. The models were considered validated when the differences were less than ±10 percent or within ±20 vehicles. Generally, the models produced traffic volumes within the criteria. However, in a few cases, minor changes were made to some of the calibration parameters such as right and left turning speeds, headways, etc. After making the changes, ten additional simulation runs were made and used for the subject analysis. The results of the validation runs are given in Appendix K.

After validating the existing models, additional steps were needed to prepare the models for future conditions application, including the selection of the Preferred Alternative. It was decided that a traffic impact study would be conducted to quantify the impacts because of the major traffic effect Genesys Health Park's development would have on the Dort Highway corridor.

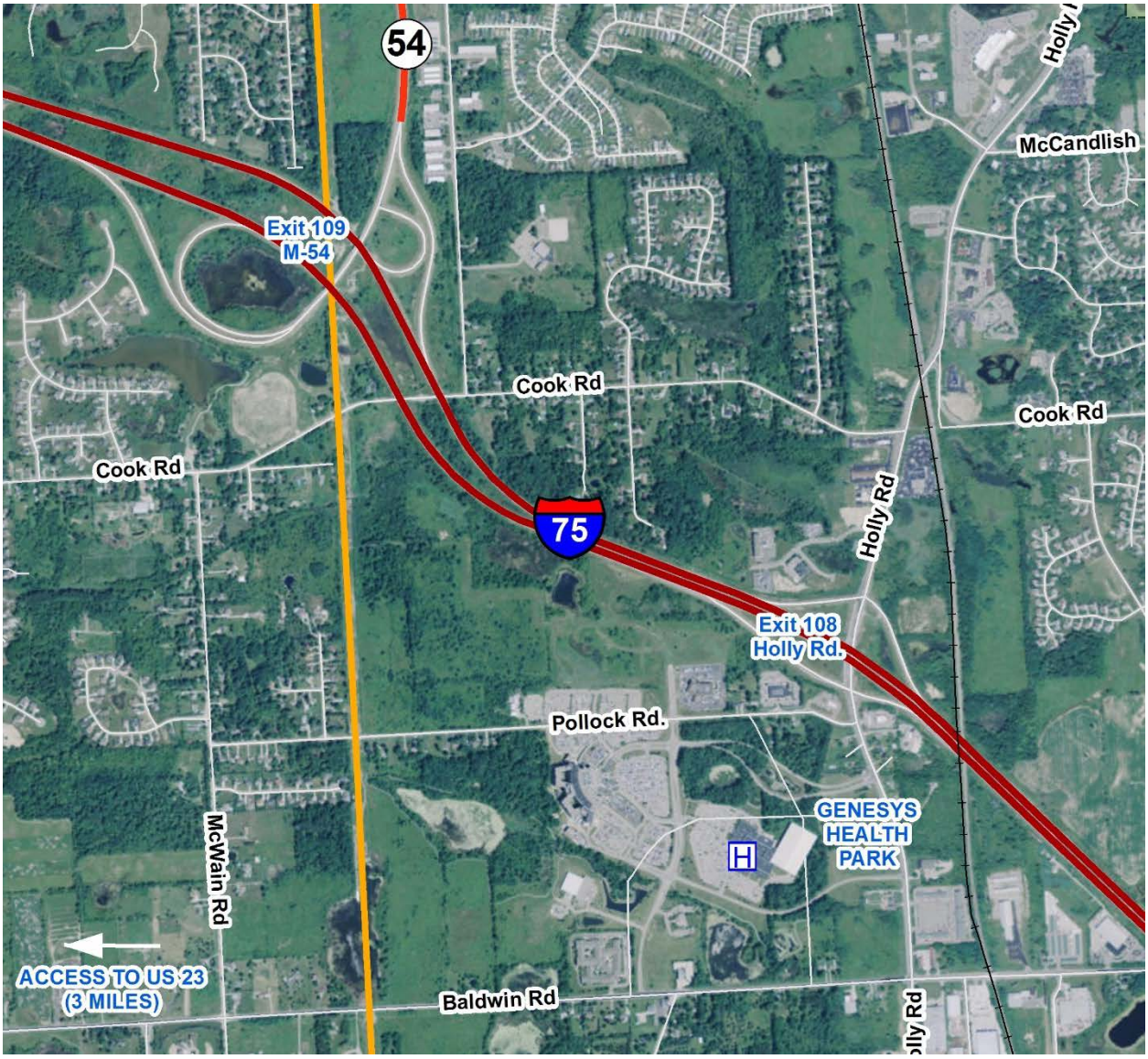
Five models for the 2020 opening year were developed. All models were based on using the 2015 models and adding background traffic to estimate traffic conditions by 2020. For the first 2020 model, the Dort Highway Extension wasn't included. For the second 2020 model, Dort Highway was included as a new road and extended from I-75 to Baldwin Road using stop-controlled intersections. The third model was the same

as the second only using roundabouts at the interchange ramps as the intersection types. The fourth model had Dort Highway connected to McWain Road with stop-controlled intersections. The fifth model had Dort Highway connected to McWain Road with roundabouts at the interchange ramps as the intersection type.

4.5.1 Estimate of Traffic Generated by the Genesys Health Park

Shown in Figure 4-3 are the existing conditions at the Genesys Health Park site. As shown in the figure, the main access to the campus site is on Holly Road. There are three alternatives for getting to and from the campus, which include Pollock Road, Genesys Parkway, and Woodbridge Boulevard. Of these alternatives, Genesys Parkway is the most heavily used as it has two lanes in each direction of travel and ties directly into the hospital area. There is an additional entrance on Baldwin Road located west of Holly Road.

Figure 4-3. Existing Travel Routes at the Genesys Health Park



Genesys Health Park's expansion plans were documented in a Feasibility Report conducted by Rowe Professional Services Company. The technical report is entitled, Overview of Genesys Operations and Planned Campus Expansions. The descriptions of the new facilities are shown in Figure 4-4.

Figure 4-4. Proposed New Genesys Health Campus Development

Project Period	Project	Description	Sq ft (1,000)
1	Senior living/mixed use/healthcare	Continuum of senior living and healthcare for the elderly	390
	PACE Center	Off-campus outpatient care center for the elderly	18-20
2	The Gateway	New entryway for Genesys campus	113
	Learning Institute	Collaboration with Kettering University for learning	62.4
	Ambulatory Care	Cancer and imaging center, and ambulatory care	320
	Research and Development	Research and development facility	450
	Residential	Single family and mixed use residence	80 units
	Retail/conferencing	Retail, hotels and restaurant space	282

The ITE trip generation, distribution and assignment process was used to estimate expected future traffic volumes as described below. The AM and PM site trips are shown in Tables 4-8 and 4-9, respectively.

ITE Land Use Codes (LUC) Senior Adult Housing-Attached Land Use Code 252, Assisted Living LUC 254, Junior/Community College LUC 540, Hospital LUC 630, Research and Development Center LUC 760, Single Family Detached Housing LUC 210, Hotel LUC 310, Quality Restaurant LUC 931, and Specialty Retail Center LUC 826 were used to produce the trip estimates for Genesys Health Park.

On some large development sites, there are internal capture trips, which reduce the number of new trips to the site. An internal capture trip occurs when a pedestrian or motorist stop at one business on the site, such as a restaurant, then walks or drives to another business such as a retail business to shop. The trip between the two businesses is an internal capture trip. The type of businesses and layout of the development was examined for the campus area. As there is only retail and restaurant land uses on the site, there is insufficient data to forecast internal trips for this development. Accordingly, no internal trips were specifically included in the analysis. However, the current methodology does take some of these trips into account. This approach is conservative, in, there may be fewer trips than estimated here.

1131

Table 4-8. AM Trips Generated by Planned Developments at the Genesys Health Park

Land Use Type	ITE Land Use	Land Use Code	Unit	Avg Units	Number of Studies	% Enter	% Exit	Ave Trip Rate	Planned Units	Trips Gen	No. Enter Total	No. Exit Total	% Pass By	No. Pass By	Pass by Enter	Pass by Exit	No. External Enter	No. External Exit	Total Trips
Senior Living	Senior Adult Housing-Attached	252	Units	138	10	34	66	0.20	138	28	9	18							
	Assisted Living	254	Beds	121	7	65	35	0.14	220	31	20	11							
Learning Institute	Junior/Community	540	Sft	501	3	74	26	2.99	62.4	187	138	49							
Ambulatory Care	Hospital	610	Sft	599	13	63	37	0.95	157	149	94	55							
Ambulatory Care	Hospital	610	Sft	599	13	63	37	0.95	163	155	98	57							
Research and Development	Research and Development Center*	760	Employees	1,038	28	86	14		450	208	179	29							
Residential	Single-Family Detached Housing	210	Dwelling Units	194	292	25	75	0.75	80	60	15	45							
Conference	Hotel	310	Beds	204	29	59	41	0.53	200	106	63	43							
Restaurant	Quality Restaurant	931	Seats	321	9	100	0	0.03	300	9	9	0							
Speciality	Specialty Retail Center**	826	Employees	50	3	2	0.9	22.36	50	1118	22	10							
Speciality	Specialty Retail Center**	826	Employees	50	3	2	0.9	22.36	50	1118	22	10							
								TOTAL:			647	318	0	0	0	0	0	0	0

*Notes: *Fitted curve equation was used instead of average rate*
***24-hour data used*

1132

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Table 4-9. PM Trips Generated by Planned Developments at the Genesys Health Park

Land Use Type	ITE Land Use	Land Use Code	Unit	Avg Units	Number of Studies	% Enter	% Exit	Ave Trip Rate	Planned Units	Trips Gen	No. Enter Total	No. Exit Total	% Pass By	No. Pass By	Pass by Enter	Pass by Exit	No. External Enter	No. External Exit	Total Trips
Senior Living	Senior Adult Housing-Attached	252	Units	138	10	54	46	0.25	138	35	19	16							
	Assisted Living	254	Beds	121	7	44	56	0.22	220	48	21	27							
The Gateway																			
Learning Institute	Junior/Community	540	Sft	501	3	58	42	2.54	62.4	158	92	67							
Ambulatory Care	Hospital	610	Sft	599	13	38	62	0.93	157	146	55	91							
Ambulatory Care	Hospital	630	Sft	599	13	38	62	0.93	163	152	58	94							
Research and Development	Research and Development Center*	760	Employees	1,049	29	10	90		450	210	21	189							
Residential	Single-Family Detached Housing	210	Dwelling Units	207	321	63	37	1.00	80	80	50	30							
Conference	Hotel	310	Beds	200	33	51	49	0.60	200	120	61	59							
Restaurant	Quality Restaurant	931	Seats	326	15	67	33	0.26	300	78	52	26	0.44	34	23	11	29	14	
Speciality	Specialty Retail Center**	826	Employees	3	50	8.4	9.2	22.36	50	1118	94	103							
Speciality	Specialty Retail Center**	826	Employees	3	50	8.4	9.2	22.36	50	1118	94	103							
									TOTAL:		524	700	0	34	23	11	29	14	0

Notes: *Fitted curve equation was used instead of average rate
**24-hour data used

1134

4.5.2 Directional Distribution

The directional distribution of the generated traffic for the future years of 2020 and 2040 onto the roadway network was based on the percentage of existing traffic at each intersection during the morning and afternoon peak periods. It should be noted that in this study, trips were not assigned to transit and non-motorized modes, which provides a more conservative estimate of vehicle trips.

4.5.3 Trip Assignment

Based on the generated trips and the directional distribution of traffic described above, the trips were assigned to the local street network including the study intersections in the Dort Highway project area. The total traffic for the 2020 and 2040 horizon years includes the traffic growth projections and the number of expected trips generated by the planned Genesys Health Park developments.

4.5.4 Traffic Capacity Analyses

This section of the report describes the capacity analyses that were conducted to quantify the level of traffic service for existing and future conditions.

Capacity analyses were conducted for the 2015 existing conditions at the intersections on the Dort Highway corridor to establish a baseline that can be used for future evaluations of traffic service. In addition to the 2015 analysis, capacity analyses were also conducted for 2020 and 2040 no-build conditions, and 2020 and 2040 full build-out conditions to reflect the impact of the planned Genesys Health Park development.

Capacity at signalized intersections is measured in terms of Level of Service (LOS). LOS values range from "A," the best traffic conditions, to "F," the worst traffic conditions. Along with the level of service, intersection capacity is quantified in terms of average control delay, which is measured in seconds of delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay and acceleration delay.

The level of service criteria for signalized intersections is given in Table 4-10. All analyses were conducted using the *Highway Capacity Software 2000 and 2010*, which is based on the procedures described in the *Highway Capacity Manual 2010 and 2016*.

Table 4-10. Level of Service Criteria for Signalized Intersections

Level of Service	Description	Control Delay Per Vehicle (Seconds)
A	Little delay, favorable progression.	≤ 10
B	Low delay, good progression.	>10-20
C	Average delay, fair progression.	>20-35
D	Longer delay, unfavorable progression.	>35-55
E	High delay, poor progression.	>55-80
F	Unacceptable delay, very poor progression.	>80

Source: Transportation Research Board, Highway Capacity Manual 2010 and 2016.

4.5.5 Estimate of Background Traffic for 2020 and 2040 Synchro Models

Background traffic is defined as traffic that has an origin and destination outside the corridor area. These are normally trips generated by other attractions in the general area that do not exist at the present time, but are expected to occur in the future.

The 2020 and 2040 background models were developed based on the 2015 existing conditions models. With the exception of Baldwin Road, the background traffic projections shown below were provided by MDOT in their *Traffic Analysis Report of July 2015*.

Table 4-11. Expected Traffic Growth Rates

Route	Growth Rate
I-75	0.50% per year
M-54/Dort Highway	0.75% per year
Holly Road	0.75% per year

Source: Michigan Department of Transportation

The Genesee County Road Commission estimated the growth rate on Baldwin Road to be 1.00% per year.

4.5.6 Capacity Results

The results of the capacity analyses for AM and PM peak-hour conditions are summarized in Tables 4-12 through 4-18 for the 2015 existing conditions, 2020 and 2040 no-build conditions, and 2020 and 2040 build-out conditions. The detailed Synchro capacity results for the 2015 existing conditions are shown in

Appendix F. The detailed results for 2020 and 2040 no-build conditions and 2020 and 2040 build-out conditions are shown in Appendices G through J, respectively.

The results of the capacity analysis for 2015 existing conditions shown in Table 4-12 indicate that many of the intersections studied have capacities ranging from "A" to "C," which is highly desirable. One exception is the intersection of Holly Road and Pollock Road, which has a capacity constrain on the eastbound approach of Pollock Road. During the morning peak hour, the level of service is "F." The problem is due to the high volumes of traffic on Holly Road during the morning, and the high volume of traffic using Pollock Road to travel to and return from Genesys Health Park. The intersection is too close to the signalized intersection of the southbound I-75 ramps to install another traffic signal.

The major problem that exists for current conditions is the heavy left-turn movement from northbound Holly Road onto the northbound ramp to I-75. Both morning and afternoon peak hours have undesirable levels of service. In view of the ongoing problem, MDOT has developed and obtained approval for constructing a northbound loop ramp to accommodate the left-turn movement. In all remaining sequences of this report, a northbound loop ramp has been added so the left-turn capacity problem and delay will not impact the selection of a Preferred Alternative.

The results of the capacity analysis for 2020 conditions for the Build and No-Build alternatives situation for intersections in the general area is shown in Tables 4-13 and 4-14. If the Dort Highway extension is built on new right-of-way (ROW), it will shift some traffic from Holly Road to Dort Highway and make operations on the entire study routes easier. As a result of the demand shift, all intersection capacities are improved. However, in the No-Build Alternative models shown in Table 4-14, capacities begin to decay especially on Holly Road, and at the intersection of Holly Road and Baldwin Road.

For the same general intersections, the 2040 design capacities are shown in Table 4-15 and 4-16. Again, due to the increases in traffic volume attributable to natural growth, the capacities on Holly Road and Dort Highway decay. Again, the intersection of Holly Road and Pollock Road has a level of service of F due to some motorist trying to exit onto Holly Road. Due to the proximity of the signal at the I-75 southbound ramp, there is little that can be done to improve capacity for this condition. However, the overall impacts are relatively minor. On the other hand, in the 2040 No-Build condition, the capacities on Holly Road, even the

new northbound loop ramp, begin to fail. The intersection of Holly Road and Baldwin Road is especially difficult to use due to the high demand and the limited capacity of the intersection.

A comparison of the capacities for the three alternative routes is shown in Tables 4-17 and 4-18 for 2020 and 2040 build conditions. This routing begins at the northern ramps at I-75, extends through the southern ramps at I-75, then turns south and includes the intersections of Cook Road, Pollock Road, and Baldwin Road. Alternatives A and B provide the same capacity results due to their proximity to each other. Alternative C runs along McWain Road. The intersections for roundabouts on Alternatives A and B have capacities that exceed those where Stop controlled signs are used, and are much better that capacities for Alternative C which has reduced cross sections due to the proximity of homes along McWain Road. This is especially true for the design year 2040.

There is a concern with some of the individual lane capacities for the Dort Highway location on new ROW. For example, see the westbound direction of Cook Road at Dort Highway in Table 4-18. This case includes a new left-turn lane that was used to provide an acceptable level of service. While at this time the geometry seems acceptable, by 2040 a signal may be required to improve the level of service. Currently the signal is not justified based on level of service.

1233 Table 4-12. Highway Capacity Results for 2015 Existing Conditions

Intersection	Approach Direction									
	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
McWain Rd and Cook Rd	A	A	A	-	A	A	A	B	-	A
	0.0	0.0	9.9	-	1.2	0.0	0.8	11.5	-	1.5
McWain Rd and Baldwin Rd	A	A	C	B	A	A	A	C	D	A
	0.1	0.0	21.0	14.9	0.7	0.5	0.3	20.2	25.2	1.4
McWain Rd and Pollock Rd	-	A	A	A	A	-	A	A	A	A
	-	8.7	0.0	6.5	5.8	-	8.8	0.0	3.7	5.5
Baldwin Rd & Health Park Blvd	A	A	-	B	A	A	-	-	B	A
	2.1	0.0	-	14.3	2.4	1.3	-	-	14.8	2.7
Holly Road and Cook Road (East Leg)	-	C	B	A	B	-	C	B	A	B
	-	33.1	11.0	5.0	11.2	-	32.8	13.1	5.5	11.6
Holly Road and Cook Road (West Leg)	C	-	A	A	A	C	-	A	B	B
	31.7	-	1.9	8.7	10.0	32.6	-	4.9	11.3	10.3
Holly Road and NB I-75 Ramps	A	D	E	C	D	A	C	D	B	C
	0.0	37.7	63.5	24.3	47.0	0.0	34.6	39.7	19.4	32.7
Holly Road and SB I-75 Ramps	D	A	B	A	C	C	A	B	A	C
	41.6	0.0	16.3	2.7	21.9	33.8	0.0	17.7	3.7	20.1
Holly Road and Pollock Road	F	C	A	A	A	D	C	A	A	A
	63.2	18.9	0.1	1.3	1.9	32.6	22.4	0.1	0.8	2.9
Holly Road and Genesys Pkwy	C	-	A	A	A	C	-	A	A	B
	32.2	-	4.4	6.4	9.5	31.0	-	7.1	5.4	12.2
Holly Road and Woodbridge Blvd	C	C	A	A	A	C	B	A	A	A
	16.1	20.4	0.6	0.1	1.4	16.0	14.4	0.7	0.0	1.8
Holly Road and Baldwin Road	D	C	A	A	C	D	C	A	B	C
	42.3	23.7	8.1	9.8	21.1	46.3	26.9	8.7	16.7	22.7
M-54 (Dort Highway) and Grand Blanc Road	C	C	C	C	C	C	C	C	C	C
	28.1	25.6	26.5	25.7	26.5	31.8	28.2	32.6	33.3	31.6
M-54 (Dort Highway) and NB I-75 Ramps	-	-	A	A	A	-	-	A	A	A
	-	-	0.0	3.0	2.4	-	-	0.0	3.6	2.1
M-54 (Dort Highway) and SB I-75 Ramps	A	A	A	A	A	A	A	A	A	A
	Free Flow									
Embury Road and Cook Road	A	A	-	B	A	A	A	-	C	A
	3.5	0.0	-	12.2	4.7	4.2	0.0	-	16.9	6.1

1234

1235 *Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.*

1236 *Notes: Letter indicates Level of Service*
1237 *Value indicates average control delay in seconds*

1238 Table 4-13. Highway Capacity Results for 2020 Build Conditions

Intersection	Approach Direction									
	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
McWain Rd and Cook Rd	A	A	B	-	A	B	B	A	-	B
	0.0	0.8	10.6	-	1.5	11.5	14.6	2.9	-	12.5
McWain Rd and Baldwin Rd	A	A	C	B	A	A	A	C	E	A
	0.5	0.0	19.5	14.5	1.0	1.2	0.7	20.4	40.4	3.4
McWain Rd and Pollock Rd	-	A	A	A	A	-	A	A	A	A
	-	9.1	0.0	4.6	4.3	-	9.5	0.0	3.2	5.2
Baldwin Rd & Health Park Blvd	A	A	-	D	A	A	A	-	C	A
	4.0	0.0	-	26.6	5.1	1.9	0.0	-	22.9	5.2
Holly Road and Cook Road (East Leg)	-	C	B	A	B	-	C	B	A	B
	-	33.2	11.8	5.4	12.0	-	32.7	15.9	6.0	13.4
Holly Road and Cook Road (West Leg)	C	-	A	A	A	C	-	A	B	B
	32.8	-	1.2	6.6	7.7	32.4	-	4.5	11.8	10.1
Holly Road and NB I-75 Ramps	-	D	A	A	A	-	D	A	B	B
	-	46.3	1.1	5.4	5.7	-	42.4	0.7	17.0	10.1
Holly Road and SB I-75 Ramps	C	A	B	A	B	C	A	B	A	B
	33.9	0.0	16.2	7.6	19.3	34.0	0.0	16.9	3.4	19.3
Holly Road and Pollock Road	F	C	A	A	A	D	C	A	A	A
	58.7	15.8	0.2	1.4	2.7	27.5	18.5	0.1	0.8	3.2
Holly Road and Genesys Pkwy	C	-	A	A	A	C	-	A	A	A
	33.4	-	3.3	3.0	5.8	32.1	-	5.2	3.4	8.6
Holly Road and Woodbridge Blvd	C	C	A	A	A	C	C	A	A	A
	17.8	22.6	1.2	0.1	2.1	20.8	15.9	1.1	0.0	3.1
Holly Road and Baldwin Road	C	C	A	A	C	D	C	A	B	C
	35.0	27.6	6.9	9.5	20.1	46.6	34.5	9.1	16.3	25.5
M-54 (Dort Highway) and Grand Blanc Road	C	C	C	C	C	C	C	C	D	C
	28.0	31.0	27.9	27.3	28.7	31.7	33.3	34.7	36.6	34.1
Embury Road and Cook Road	A	A	-	B	A	A	A	-	C	A
	5.9	0.0	-	12.5	6.2	4.0	0.0	-	19.9	6.8

1239

1240 *Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.*

1241 *Notes: Letter indicates Level of Service*
1242 *Value indicates average control delay in seconds*
1243 *Values for the new Dort Highway Corridor Extension intersections are shown in Tables 4-17 and 4-18*
1244

1245 Table 4-14. Highway Capacity Results for 2020 No-Build Conditions

Intersection	Approach Direction									
	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
McWain Rd and Cook Rd	A	A	B	-	A	A	A	B	-	A
	0.0	2.1	10.6	-	2.9	0.0	1.8	13.3	-	3.0
McWain Rd and Baldwin Rd	A	A	D	C	A	A	A	E	F	C
	0.5	0.0	33.9	19.9	1.6	1.1	0.5	38.3	236.2	21.7
McWain Rd and Pollock Rd	-	A	A	A	A	-	B	A	A	A
	-	9.6	0.0	5.9	6.2	-	10.9	0.0	4.6	7.4
Baldwin Rd & Health Park Blvd	A	A	-	D	A	A	A	-	C	A
	3.7	0.0	-	27.4	5.0	1.9	0.0	-	24.0	5.4
Holly Road and Cook Road (East Leg)	-	C	B	A	B	-	C	B	A	B
	-	33.2	13.7	5.7	12.7	-	32.7	18.2	6.3	14.3
Holly Road and Cook Road (West Leg)	C	-	A	A	B	C	-	A	B	B
	31.6	-	1.9	9.7	10.5	32.4	-	4.1	12.7	10.4
Holly Road and NB I-75 Ramps	-	D	B	B	B	-	D	D	B	C
	-	47.3	11.3	14.3	15.2	-	42.4	38.0	17.1	31.5
Holly Road and SB I-75 Ramps	E	A	C	A	D	D	A	E	A	D
	76.5	0.0	30.0	8.1	41.4	35.5	0.0	65.3	4.6	45.0
Holly Road and Pollock Road	F	C	A	A	A	F	E	A	A	A
	365.1	24.3	0.3	1.1	6.1	140.9	43.1	0.1	0.9	9.9
Holly Road and Genesys Pkwy	C	-	A	A	A	C	-	A	A	B
	32.0	-	4.7	7.1	9.8	35.0	-	9.4	7.5	15.3
Holly Road and Woodbridge Blvd	C	D	A	A	A	C	C	A	A	A
	19.9	26.3	1.1	0.1	2.0	21.4	17.7	1.0	0.0	2.9
Holly Road and Baldwin Road	E	C	A	B	C	F	C	A	B	E
	70.5	23.8	8.9	12.6	29.2	214.1	34.3	9.1	18.9	56.5
M-54 (Dort Highway) and Grand Blanc Road	C	C	C	C	C	C	C	C	D	C
	28.1	25.6	26.6	26.0	26.6	31.8	28.2	33.7	35.2	32.4
M-54 (Dort Highway) and NB I-75 Ramps	-	-	A	A	A	-	-	A	A	A
	-	-	0.0	3.1	2.5	-	-	0.0	3.7	2.2
M-54 (Dort Highway) and SB I-75 Ramps	A	A	A	A	A	A	A	A	A	A
	Free Flow									
Embury Road and Cook Road	A	A	-	B	A	A	A	-	C	A
	3.5	0.0	-	13.7	5.2	4.4	0.0	-	20.4	7.1

1246

1247 *Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.*

1248 *Notes: Letter indicates Level of Service*
1249 *Value indicates average control delay in seconds*
1250

1251 Table 4-15. Highway Capacity Results for 2040 Build Conditions

Intersection	Approach Direction									
	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
McWain Rd and Cook Rd	A	A	B	-	A	A	A	B	-	A
	0.0	0.7	10.8	-	1.5	0.0	1.3	12.4	-	1.7
McWain Rd and Baldwin Rd	A	A	C	B	A	A	A	B	C	A
	0.2	0.0	19.6	13.5	0.5	0.5	0.2	13.2	16.5	2.3
McWain Rd and Pollock Rd	-	A	A	A	A	-	A	A	A	A
	-	9.1	0.0	4.6	4.2	-	9.6	0.0	3.2	5.0
Baldwin Rd & Health Park Blvd	A	A	-	B	A	A	A	-	B	A
	4.1	0.0	-	14.9	3.8	1.9	0.0	-	14.9	3.4
Holly Road and Cook Road (East Leg)	-	C	B	A	B	-	C	B	A	B
	-	32.3	13.2	5.8	12.3	-	32.7	19.5	6.6	15.2
Holly Road and Cook Road (West Leg)	C	-	A	A	A	C	-	A	B	B
	32.8	-	1.4	7.2	7.5	32.3	-	5.5	13.1	11.0
Holly Road and NB I-75 Ramps	-	D	A	A	A	-	D	A	B	B
	-	48.8	1.8	6.6	6.6	-	46.3	0.8	17.9	10.7
Holly Road and SB I-75 Ramps	C	A	B	A	C	D	A	C	A	C
	34.8	0.0	19.5	8.9	21.2	35.6	0.0	21.1	4.6	21.9
Holly Road and Pollock Road	F	C	A	A	A	E	C	A	A	A
	108.7	18.3	0.2	1.7	3.6	36.6	22.9	0.1	1.0	3.7
Holly Road and Genesys Pkwy	C	-	A	A	A	C	-	A	A	A
	33.3	-	3.2	3.2	5.7	31.7	-	5.5	3.7	8.8
Holly Road and Woodbridge Blvd	C	D	A	A	A	D	C	A	A	A
	20.3	27.1	1.2	0.1	2.1	26.5	19.6	1.1	0.0	3.4
Holly Road and Baldwin Road	D	C	A	B	C	E	D	A	B	C
	38.7	29.8	7.8	10.7	22.4	60.6	42.1	9.8	19.3	31.3
M-54 (Dort Highway) and Grand Blanc Road	C	C	C	C	C	C	C	D	D	D
	28.0	32.7	29.5	29.3	30.0	31.6	33.6	43.8	48.4	40.3
Embury Road and Cook Road	A	A	-	B	A	A	A	-	D	A
	5.8	0.0	-	12.8	6.0	4.1	0.0	-	25.3	8.2

1252

1253 *Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.*

1254 *Notes: Letter indicates Level of Service*
1255 *Value indicates average control delay in seconds*
1256 *Values for the new Dort Highway Corridor Extension intersections are shown in Tables 4-17 and 4-18*

1257 Table 4-16. Highway Capacity Results for 2040 No-Build Conditions

Intersection	Approach Direction									
	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
McWain Rd and Cook Rd	A	A	B	-	A	A	A	B	-	A
	0.0	2.1	10.6	-	2.9	0.0	1.8	13.3	-	3.0
McWain Rd and Baldwin Rd	A	A	C	B	A	A	A	C	D	A
	0.2	0.0	19.2	11.7	0.7	0.5	0.2	18.8	31.8	2.8
McWain Rd and Pollock Rd	-	A	A	A	A	-	B	A	A	A
	-	9.6	0.0	5.9	6.2	-	11.0	0.0	4.6	7.3
Baldwin Rd & Health Park Blvd	A	A	-	C	A	A	A	-	C	A
	3.9	0.0	-	15.1	3.7	1.9	0.0	-	15.4	3.4
Holly Road and Cook Road (East Leg)	-	C	B	A	B	-	C	C	A	B
	-	33.2	13.8	6.2	12.4	-	32.7	22.3	7.4	16.4
Holly Road and Cook Road (West Leg)	C	-	A	B	B	C	-	A	B	B
	31.6	-	2.0	10.4	10.7	32.4	-	6.6	16.5	12.9
Holly Road and NB I-75 Ramps	-	D	C	B	C	-	D	C	B	C
	-	49.6	22.8	15.5	21.6	-	46.6	33.4	19.9	29.7
Holly Road and SB I-75 Ramps	F	A	D	A	E	D	A	F	A	F
	117.6	0.0	52.3	8.8	63.4	42.8	0.0	146.5	5.0	88.9
Holly Road and Pollock Road	F	F	A	A	C	F	F	A	A	C
	1037.1	143.7	0.4	1.4	17.2	392.7	86.4	0.1	1.3	22.7
Holly Road and Genesys Pkwy	C	-	A	A	B	C	-	B	A	B
	32.0	-	4.5	9.0	10.3	35.0	-	11.2	8.4	15.6
Holly Road and Woodbridge Blvd	C	D	A	A	A	D	C	A	A	A
	22.1	31.7	1.1	0.1	2.0	32.4	19.5	0.9	0.0	3.7
Holly Road and Baldwin Road	F	C	A	B	E	F	E	A	D	F
	167.9	26.2	9.2	13.8	55.2	311.2	62.4	9.8	40.9	88.9
M-54 (Dort Highway) and Grand Blanc Road	C	C	C	C	C	C	C	D	D	D
	28.1	25.6	27.4	27.7	27.2	31.8	28.2	40.9	51.1	39.3
M-54 (Dort Highway) and NB I-75 Ramps	-	-	A	A	A	-	-	A	A	A
	-	-	0.0	3.1	2.6	-	-	0.0	3.8	2.3
M-54 (Dort Highway) and SB I-75	A	A	A	A	A	A	A	A	A	A
	Free Flow									
Embury Road and Cook Road	A	A	-	B	A	A	A	-	C	A
	3.5	0.0	-	13.7	5.2	4.4	0.0	-	20.4	7.1

1258

1259 *Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.*

1260 *Notes: Letter indicates Level of Service*
1261 *Value indicates average control delay in seconds*

1262

1263 Table 4-17. Highway Capacity Results for 2020 Conditions with Roundabout with Stop-Controlled Conditions

Intersection	2020 AM Alternatives																			
	Alternative A and B										Alternative C									
	Roundabout / Dort Highway					Stop-Controlled / Dort Highway					Roundabout / McWain					Stop-Controlled / McWain				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
NB I-75 Ramps at Dort Highway	-	A	A	A	A	-	E	A	A	A	-	A	A	A	A	-	E	A	A	A
	-	5.4	8.9	2.0	4.8	-	35.6	0.0	3.3	3.4	-	5.4	8.9	2.0	4.8	-	35.6	0.0	3.3	3.4
SB I-75 Ramps at Dort Highway	A	A	A	-	A	C	B	C	-	C	A	A	A	-	A	C	B	C	-	C
	9.6	5.0	8.9	-	8.7	19.6	10.2	18.1	-	15.7	9.6	5.0	8.9	-	8.7	19.6	10.2	18.1	-	15.7
Cook Road	C	C	A	A	A	C	C	A	A	A	B	B	A	A	A	B	B	A	A	A
	22.4	18.6	0.3	0.1	5.2	22.4	18.6	0.3	0.1	5.2	14.2	14.0	0.9	0.1	3.8	14.2	14.0	0.9	0.1	3.8
Pollock Road	D	B	A	A	A	D	B	A	A	A	-	C	A	A	B	-	C	A	A	B
	28.7	14.7	0.2	7.7	9.2	28.7	14.7	0.2	7.7	9.2	-	24.6	0.0	9.6	11.5	-	24.6	0.0	9.6	11.5
Baldwin Road	A	A	-	C	A	A	A	-	C	A	A	A	C	D	A	A	A	C	D	A
	1.2	0.0	-	24.0	3.1	1.2	0.0	-	24.0	3.1	1.6	0.0	23.4	40.0	5.2	1.6	0.0	23.4	40.0	5.2

Intersection	2020 PM Alternatives																			
	Alternative A and B										Alternative C									
	Roundabout / Dort Highway					Stop-Controlled / Dort Highway					Roundabout / McWain					Stop-Controlled / McWain				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
NB I-75 Ramps at Dort Highway	-	A	B	A	A	-	C	A	A	A	-	A	B	A	A	-	C	A	A	A
	-	5.1	10.8	1.8	6.9	-	19.5	0.0	4.0	1.9	-	5.1	10.8	1.8	6.9	-	19.5	0.0	4.0	1.9
SB I-75 Ramps at Dort Highway	A	A	C	-	B	C	A	D	-	C	A	A	C	-	B	C	A	D	-	C
	7.7	4.5	16.2	-	10.8	19.1	9.0	25.5	-	18.4	7.7	4.5	16.2	-	10.8	19.1	9.0	25.5	-	18.4
Cook Road	C	D	A	A	B	C	D	A	A	B	C	C	A	A	A	C	C	A	A	A
	19.8	32.3	0.1	0.1	11.3	19.8	32.3	0.1	0.1	11.3	17.1	21.5	0.4	0.1	8.2	17.1	21.5	0.4	0.1	8.2
Pollock Road	B	C	A	A	B	B	C	A	A	B	-	F	A	A	E	-	F	A	A	E
	13.3	18.5	0.0	5.2	11.8	13.3	18.5	0.0	5.2	11.8	-	87.1	0.0	5.2	44.6	-	81.7	0.0	5.2	44.6
Baldwin Road	A	A	-	C	A	A	A	-	C	A	A	A	C	F	C	A	A	C	F	C
	1.6	0.0	-	27.2	3.6	1.6	0.0	-	27.2	3.6	2.1	0.2	24.1	123.1	24.4	2.1	0.2	24.1	123.1	24.4

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.
Note: Letter indicates Level of Service
Value indicates average control delay in seconds

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1266 Table 4-18. Highway Capacity Results for 2040 Conditions with Roundabout and Stop-Controlled Conditions

Intersection	2040 AM Alternatives																			
	Alternative A and B										Alternative C									
	Roundabout / Dort Highway					Stop-Controlled / Dort Highway					Roundabout / McWain					Stop-Controlled / McWain				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
NB I-75 Ramps at Dort Highway	-	A	B	A	A	-	F	A	A	A	-	A	B	A	A	-	F	A	A	A
	-	5.8	10.8	2.2	5.6	-	64.5	0.0	3.7	4.8	-	5.8	10.8	2.2	5.6	-	64.5	0.0	3.7	4.8
SB I-75 Ramps at Dort Highway	B	A	B	-	A	D	B	D	-	C	B	A	B	-	A	D	B	D	-	C
	10.6	5.3	10.7	-	9.9	27.9	11.4	28.3	-	21.6	10.6	5.3	10.7	-	9.9	27.9	11.4	28.3	-	21.6
Cook Road	D	C	A	A	A	D	C	A	A	A	B	B	A	A	A	B	B	A	A	A
	27.5	19.8	0.3	0.1	5.9	27.5	19.8	0.3	0.1	5.9	15.0	14.3	0.8	0.1	3.8	15.0	14.3	0.8	0.1	3.8
Pollock Road	D	C	A	A	A	D	C	A	A	A	-	D	A	A	B	-	D	A	A	B
	31.4	15.6	0.0	7.6	9.5	31.4	15.6	0.2	7.6	9.5	-	33.0	0.0	9.7	14.0	-	33.0	0.0	9.7	14.0
Baldwin Road	A	A	-	B	A	A	A	-	B	A	A	A	B	B	A	A	A	B	B	A
	1.4	0.0	-	13.5	2.2	1.4	0.0	-	13.5	2.2	1.7	0.0	16.1	16.0	2.8	1.7	0.0	16.1	16.0	2.8

Intersection	2040 PM Alternatives																			
	Alternative A and B										Alternative C									
	Roundabout / Dort Highway					Stop-Controlled / Dort Highway					Roundabout / McWain					Stop-Controlled / McWain				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
NB I-75 Ramps at Dort Highway	-	A	B	A	A	-	C	A	A	A	-	A	B	A	A	-	D	A	A	A
	-	5.5	13.6	1.9	8.5	-	24.8	0.0	4.6	2.2	-	5.5	13.6	1.9	8.5	-	25.7	0.0	4.6	2.2
SB I-75 Ramps at Dort Highway	A	A	D	-	B	D	A	E	-	D	A	A	D	-	B	D	A	E	-	D
	8.9	4.7	25.1	-	14.9	33.8	9.7	46.2	-	31.0	8.9	4.7	25.1	-	14.9	33.8	9.7	46.2	-	31.0
Cook Road	C	E	A	A	B	C	E	A	A	B	C	D	A	A	A	C	D	A	A	A
	21.4	42.4	0.0	0.1	14.5	21.4	42.4	0.0	0.1	14.5	18.3	25.9	0.4	0.1	9.8	18.3	25.9	0.4	0.1	9.8
Pollock Road	B	C	A	A	B	B	C	A	A	B	-	F	A	A	E	-	F	A	A	E
	13.5	19.7	0.0	4.6	11.6	13.5	19.7	0.0	4.6	11.6	-	94.3	0.0	4.6	48.2	-	94.3	0.0	4.6	48.2
Baldwin Road	A	A	-	B	A	A	A	-	B	A	A	A	B	C	A	A	A	B	C	A
	1.8	0.0	-	13.9	2.4	1.8	0.0	-	13.9	2.4	2.5	0.2	15.3	22.8	5.6	2.5	0.2	15.3	22.8	5.6

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.
Note: Letter indicates Level of Service
Value indicates average control delay in seconds

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4.5.7 Traffic Performance Measures

Capacity is one measure used to estimate the performance of vehicles with specific geometric features and type of traffic control. Capacity quantifies the amount of delay one can expect at a given intersection during a particular time period. Simulation models, such as SimTraffic, provide measures of traffic performance effectiveness for the entire corridor for specific time periods. After completing the capacity analysis for 2015 existing conditions, the SimTraffic models were calibrated and validated to ensure that they reflected actual field operating conditions. Following validation of the models, the traffic performance measures were obtained. For this analysis, 10 simulation runs were made with the 2015 existing conditions AM and PM models and 10 simulation runs were made with the 2020 and 2040 Build and No-Build AM and PM models.

The performance measures included total delay on the corridor, which consisted of delay to Dort Highway traffic and to the side-street approaches, total stops in the network, travel time, and the average speed on Dort Highway and the side streets. The average speed shown here is the average speed on the network, not the average free-flow speed of traffic, which is much higher than the network speed. The results of the analysis are shown in Tables 4-19 through 4-20. The Change (%) values shown are the differences between 2020 no-build conditions and 2020 built conditions with the new Genesee Health Park development.

It is important to note that the total delay and travel time on the corridor will increase when the Genesys Health Park is built out and open for business in 2020. As previously mentioned, the development is expected to attract almost 1,000 new trips during the weekday afternoon peak hour.

The performance measures and levels of service presented in this report should not be interpreted as an indication that the “corridor” has been built out and no further development or redevelopment is possible.

The comparison shown in Tables 4-19 and 4-20 clearly support the Dort Highway extension on new ROW. Delay and stops are significantly reduced while travel speeds are increased. There are increases in environmental emissions. However, this is due to the fact that speeds have increased. The emissions are much higher under the no-build scenarios.

As previously mentioned, the traffic analyses included a review of stop-controlled intersections at the I-75 ramps terminals and Dort Highway and roundabouts at these locations. The results of the capacity

analyses opening year 2020, shown in Table 4-17, indicate that the roundabouts generally had a better level of service than the stop-controlled intersections, but both features work without creating a traffic problem. The traffic performance results for 2020, Table 4-19, show little difference between the two alternatives. By the 2040 design year, both options again are working, but the roundabout option provides a consistent level of service A and B for the various approaches. By 2040, the roundabout alternative begins to show improved traffic performance for all measures of effectiveness. In view of the capacity and performance values, and the county preference for roundabouts, the Roundabout alternative was selected to be incorporated into the Preferred Alternative for the project.

It should be noted, however, that the roundabout concept has been selected as a preferred alternative because of the improved traffic performance it offers. When reviewing the suitability of the sites for roundabouts, only general right-of-way and grade conditions were examined for this concept. During the actual design of roundabouts, the topographic and right-of-way survey, utility conflicts, etc. will be used to guide the design. In addition, RODEL will be used to examine the best configuration (inscribed diameter, entry width, flare length, etc.) for the design. Finally, the design must be approved by the Michigan Department of Transportation. Sometimes, one of more of these items prevents the design from proceeding and another alternative must be selected. For this reason, the stop-controlled option may be used in the final project design.

1318 Table 4-19. Weekday 2020 AM and PM Peak Hour Traffic Performance Measures

2020 AM

MOE	No Build	Stop Controlled	Roundabout	Stop Controlled Using McWain	Roundabout Using McWain	Change (%)
Total Delay (hours)	273.2	113.2	115.6	122.3	116.3	-57.7%
Total Stops	14,338	13,130	12,197	12,946	12,078	-14.9%
Total Travel Time (hours)	770.5	609.1	620.1	629.3	632.2	-19.5%
Average Speed (mph)	30	38	37	37	37	23.3%
Fuel Used	856.7	844.1	846.9	848.1	849.9	-1.1%
HC Emission	13001	13576	13548	13456	13554	4.2%
CO Emissions	624750	653444	651410	644036	641933	4.3%
NOx Emissions	45084	47067	46805	46505	46559	3.8%

2020 PM

MOE	No Build	Stop Controlled	Roundabout	Stop Controlled Using McWain	Roundabout Using McWain	Change (%)
Total Delay (hours)	529.6	227.8	277.5	322.1	248.5	-47.6%
Total Stops	17,502	17,763	17,046	18,023	16,860	-2.6%
Total Travel Time (hours)	1174	854.6	914.3	963.8	894.6	-22.1%
Average Speed (mph)	25	35	33	31	34	32.0%
Fuel Used	1162.9	1116.4	1137.6	1143.6	1132.1	-2.2%
HC Emission	16999	17533	17083	16825	17105	0.5%
CO Emissions	808108	850426	850616	830791	837805	5.3%
NOx Emissions	58194	59854	58734	58260	58589	0.9%

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1320 *Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.*

Table 4-20. Weekday 2040 AM and PM Peak Hour Traffic Performance Measures

2040 AM

MOE	No Build	Stop Controlled	Roundabout	Stop Controlled Using McWain	Roundabout Using McWain	Change (%)
Total Delay (hours)	419.7	162.7	154.1	176	161.4	-63.3%
Total Stops	17,549	15,009	13,863	14,925	13,974	-21.0%
Total Travel Time (hours)	981.9	726.2	716.3	753.4	740.3	-27.0%
Average Speed (mph)	26	36	36	35	35	38.5%
Fuel Used	984.7	959.8	957	971.1	965.9	-2.8%
HC Emission	14328	14942	15289	14960	15144	6.7%
CO Emissions	700010	735174	740632	731226	732523	5.8%
NOx Emissions	49225	51518	52248	51389	51611	6.1%

2040 PM

MOE	No Build	Stop Controlled	Roundabout	Stop Controlled Using McWain	Roundabout Using McWain	Change (%)
Total Delay (hours)	994.8	410.2	394.6	504.8	431.4	-60.3%
Total Stops	28,484	20,575	19,298	21,062	20,223	-32.2%
Total Travel Time (hours)	1897.3	1156.1	1144.1	1267.2	1194.1	-39.7%
Average Speed (mph)	19	29	30	27	29	57.9%
Fuel Used	1399.3	1291.7	1285.5	1310.2	1303.9	-8.1%
HC Emission	17791	19264	18661	19081	18767	4.9%
CO Emissions	814475	919506	904092	907558	905039	11.0%
NOx Emissions	61048	65466	64320	64504	64202	5.4%

Source: Dort Highway Transportation Plan, 2016, Wade Trim Associates, Inc.

4.5.8 Vehicle Queuing at Intersections

In addition to the traffic performance measures previously described, the results of simulations provided an opportunity to examine the expected vehicle queues by lane on each intersection approach. Queues are measured in terms of maximum, average and 95th percentile queue. This information is typically used to identify operational problems that cannot be examined with traditional capacity analyses. The results of these analyses were used to determine the length of the left- and right-turn lanes that are included in the mitigation for the 2020 Genesys Health Park development.

4.5.9 Validation of Synchro Models

To ensure that the Synchro models were correctly replicating actual volumes measured in the field, simulation runs were made to compare actual volumes to simulated volumes. Worksheets showing the detailed results of the simulation runs for each peak period for existing conditions are provided in Appendix K. For each time period, the actual and simulated volumes were within the acceptable range of 20 vehicles or 10% of the volume.

4.5.10 Conclusion

This analysis was undertaken to examine the impacts of all reasonable alternatives, which will aid in the selection of a Preferred Alternative. The three primary alternatives included Alternative A, putting the Dort Highway extension on new ROW from the existing I-75 interchange to Baldwin Road; Alternative B, putting the Dort extension on new ROW beginning at the end of the Dort bridge over I-75 and extending it south to Cook Road where is followed the same path as Alternative A to Baldwin Road. Alternative C was to run the extension from the I-75 interchange to tie into and use McWain Road to reach Baldwin Road.

Based on the results of the capacity analyses and traffic performance results, using roundabouts at the I-75 ramp terminals and extending Dort Highway on new alignment from I-75 to Baldwin Road, Alternative A was selected as the Preferred Alternative. The results of the analyses and selection of the Preferred Alternative is discussed in Section 5 of this report.

5.0 PREFERRED ALTERNATIVE FEATURES

There are a number of tangible benefits to motorists using the Preferred Alternative compared to either the No-Build Alternative option or Alternatives B and C. The cross section for the Preferred Alternative is shown in Figure 5-1.

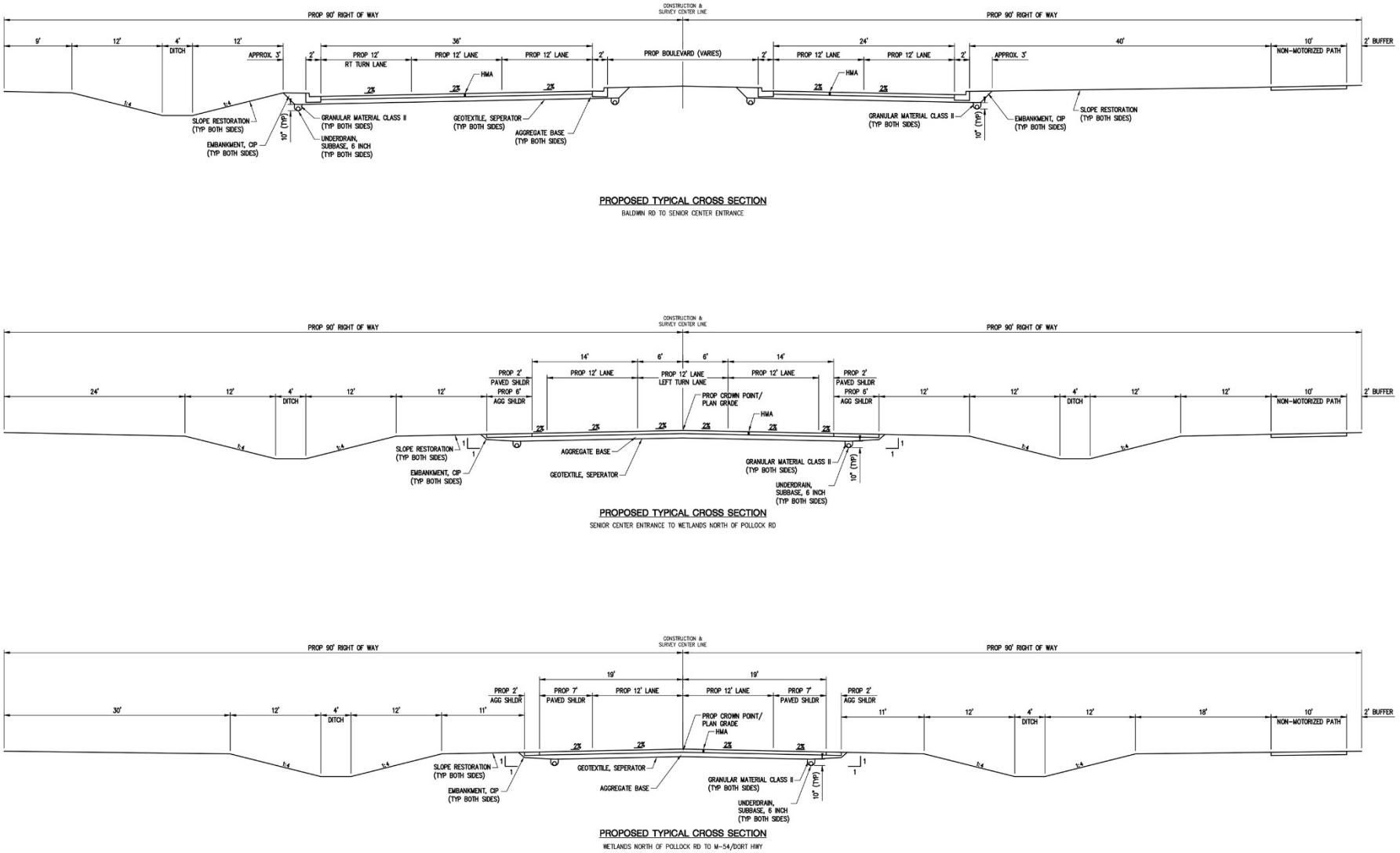
These benefits were compared using the Synchro models for 10 simulation runs over the network, and the results were shown previously in Tables 4-19 and 4-20. First, with respect to the build-out year of 2020, total delay on the network during the morning and afternoon peak hour is expected to be reduced by 58% and 48% respectively compared to no-build conditions. By the design year of 2040, travel time will be reduced by 63% and 60% during the morning and afternoon peak periods compared to conditions in the no-build scenario. Along with these reductions in total vehicle delay, during 2020 in the afternoon peak hour, a 2.6% reduction in the number of vehicle stops, and a reduction of 22% in total travel time is expected along with a 2% reduction in the amount of fuel used. Similar reductions are anticipated during the morning periods in 2020 and 2040.

However, the reduction in delay and improvements in travel time come with a general increase in vehicle speeds from 25 miles per hour to an estimated 33 miles per hour during the 2020 year, afternoon peak period. The increase in speeds means an increase in hydrocarbons, carbon monoxide and nitrogen oxides ranging from 0.5% to 5%. Overall, this is a small tradeoff for accruing significant vehicle operational benefits.

It should be noted that similar benefits will continue to accrue during the morning peak hours and throughout the day. It is also important to note that the benefits are only estimates of vehicle operations. By completing the vehicle trip in a shorter time with less stress, drivers and their passengers will have more time to pursue their normal activities like dining, shopping, working, etc.

The Preferred Alternative will impact wetlands and streams. However, these impacts will be minimized by removing the center turn lane and reducing the roadway section to 2-lane section in the wetland area. In addition, as the final design is further developed, the compensatory wetland mitigation proposal can be better defined and quantified so that the losses will be compensated within the project area with equivalent wetland functions in the mitigation proposal.

1383 Figure 5-1. Dort Highway Cross Section



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Improvements to the regional non-motorized system would be advanced in the Preferred Alternative. The shared-use path will connect both the planned regional trail network as well as over six-miles of public access trails within Genesys Health Park's campus. The social and community impacts are minimized by the Preferred Alternative, as the majority of the new corridor will be buffered from the existing neighborhood by the Consumers Energy right-of-way. This alignment was preferred by the majority of the public comments during the Public Information Meeting earlier this year.

6.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section presents the results of the Social, Environmental and Economic impact analysis. The maps (Figures 6-1 through 6-6) illustrate some of the environmental factors analyzed, represent data taken from corresponding agencies, and provide a basis for field surveys. For Alternative A and B the majority of the proposed Dort Highway extension work occurs within Genesys Health Park's property of which the right-of-way (ROW) will be donated. For Alternative C the majority of the proposed Dort Highway Extension work will occur with the McWain Road corridor, however, the width of the corridor is insufficient and will require additional acquisition and easements to construct this alternative. The 500-foot buffer shown on all the Build Alternatives is the extent of the environmental review where most impacts may occur.

6.1 LAND USE IMPACTS

This section provides an overview of existing land use and related characteristics in the study area. Subsections provide a summary of land use planning and zoning, and an overview of each land use classification including Residential, Health Care Park, Utilities, Commercial, and Open Space. Impacts to land use are also discussed.

Planning and zoning documents adopted for use in the study area include:

- Grand Blanc Township Master Plan Update (2010)
- Grand Blanc Township Master Plan (2013 Supplemental Amendment)
- Grand Blanc Township Zoning Map (June 2014)

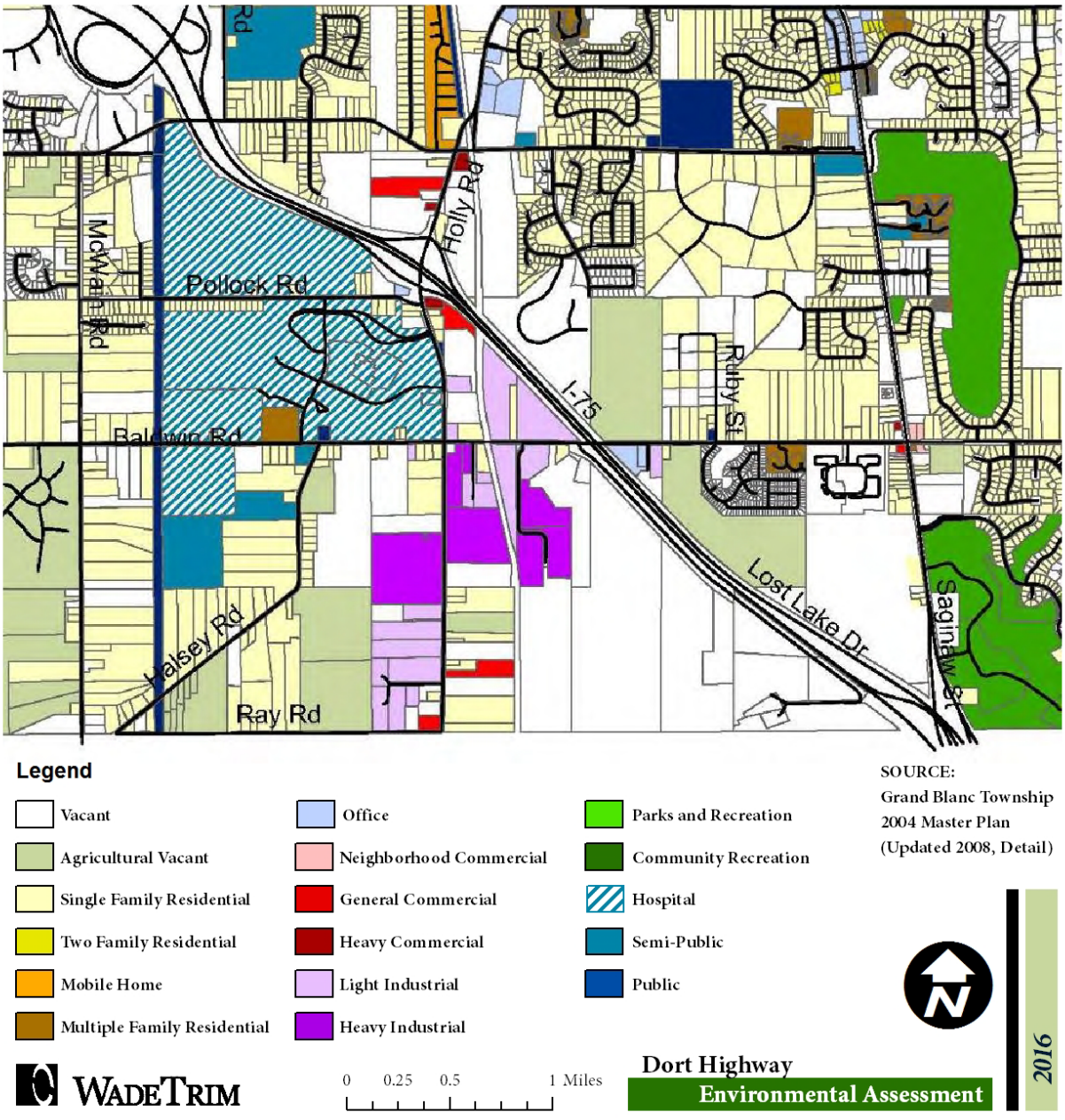
6.1.1 Existing Land Use

The existing land uses adjacent to the proposed Dort Highway extension include single-family residential, multi-family residential, open space, Consumers Energy utility easement and commercial/health care park (See Figure 6-1).

The Genesys Health Park is located on the southeastern portion of the project area, and consists of a variety of medical/office buildings.

A Consumers Energy ROW runs through the proposed project area as shown on Figure 6-1. The utility ROW provides a buffer between the Genesys Health Park property and the low-density, single-family residential uses west of the easement. The proposed Dort Highway extension will be primarily located on Genesys Health Park property and will not change the current land uses planned for this area.

Figure 6-1. Grand Blanc Township Existing Land Use Map



6.1.2 Zoning

Land is available for additional development in the project area. The existing zoning reflects these uses. Most of the proposed project area is zoned for "Health Care District" (HCD) in the June 2014 Grand Blanc Township Zoning Map shown in Figure 6-4. The majority of ROW that is needed for this project is zoned HCD and will be converted to transportation land use as a result of the proposed improvements.

6.1.3 Future Land Use

The Grand Blanc Township Land Use Plan, adopted on June 3, 2010 (Figure 6-3), identifies most project area as planned for "Health Care Park." In addition, areas near Pollock and Holly roads are planned for Community Commercial and the northwest corner of Baldwin and Holly roads is planned for "Flexible Development" by the Grand Blanc Township Master Plan.

The Grand Blanc Township Master Plan aims to strengthen the economy by creating the best climate for retaining existing businesses and recruiting new businesses. This means providing adequate land, buildings and infrastructure to support industry needs. It also means addressing quality of life issues, including education, recreation and culture.

The major land use, Genesys Health Park's campus, has plans to expand development on the campus. Proposed projects include senior living, PACE Center, Learning Institute, Cancer and Imaging Center, single-family and mixed-use residential, and retail/conference space.

The proposed Dort Highway extension is consistent with the goals of the Grand Blanc Master Plan and Zoning Map.

6.2 Right-of-Way and Relocation Impacts

As has been documented in previous sections of the Environmental Assessment several alternative alignments were evaluated, which considered the impacts on right-of-way. Alternatives A and B require displacement and relocation. While Alternative C reduces one relocation, there will be a significant increase in impacts to all other properties within the route requiring grading easements and fee take right-of-way.

The Preferred Alternative (Alternative A) will impact approximately 30.8 acres of land, which will include a combination of fee take ROW, donated ROW, and grading easements. There will be three (3)

displacements with this alternative; one at the end of the Cook Road split and two along Pollock Road, along with a complete take of the vacant land between Cook Road and the Cook Road split. Fee take ROW will also be required for the property needed between Cook Road and the existing M-54/Dort Highway ramps. Estimated ROW impacts were calculated and tabulated by property, as shown in Table 6-1.

Alternative B has very similar ROW impacts to Alternative A. While this option would avoid one displacement, it would require displacement at another property that is a historic property. With Alternative C, displacements could possibly be avoided. However, from Cook Road to Pollock Road, fee take ROW would be needed at two properties along with grading easements at all 35 properties. From Pollock Road to Baldwin Road, fee take and grading easements would be likely at all 16 properties. Fee take ROW would also be needed north of Cook Road up to the connection point with the existing M-54/Dort Highway ramps.

Much of the Preferred Alternative extends through the existing Genesys Health Park property. Genesys has agreed to donate all the property necessary for the Preferred Alternative, which is south of Cook Road down to Baldwin Road, on the east side of the Consumers Energy ROW, a total of 18.38 acres. Easements will be required where the Preferred Alternative crossed the Consumers Energy ROW. Four complete property takes, which will include three displacements will be needed. In addition, partial fee take ROW acquisition will be required on two properties north of Cook Road. The partial acquisition of a property occurs when only a portion of the property is needed for constructing the Preferred Alternative. Examples of partial acquisitions are the purchase of a property corner to improve sight distance at an intersection, or the purchase of a continuous strip along the length of a property.

Whether the acquisitions are partial or full could change during negotiations with the property owners. All fee ROW will be acquired in conformance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. The acquiring agency will offer assistance to all eligible residents, businesses, farms and non-profit organizations impacted by the project, including persons requiring special services and assistance. The agency's relocation program will provide such services in accordance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; Act 149, Michigan P.A. 1911, as amended; Act 87, Michigan P.A. 1980 as amended, Act 367, Michigan P.A. 2006, as amended; Act 439, Michigan P.A. 2006, as amended; and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. The acquiring agency's relocation program will be realistic and will provide for the orderly, timely and efficient relocation of all

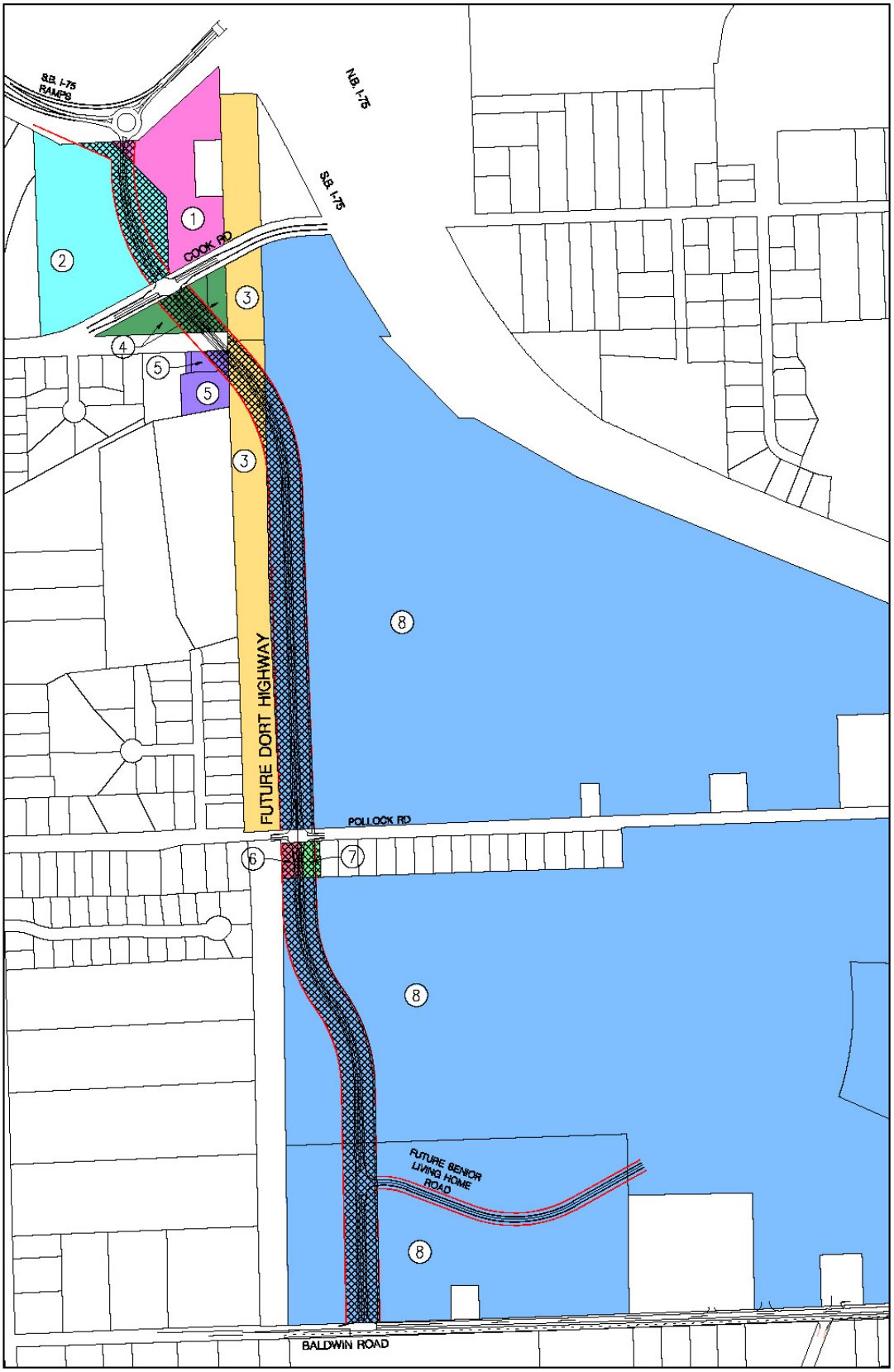
eligible displaced persons in compliance with state and federal guidelines. A Conceptual Relocation Plan is included in Appendix N of this document.

Table 6-1. Preferred Alternative (Alt.-A) Right-of-Way Acquisitions/Easements

Impact Parcel #	Address	Total Property Area (acres)	Total Take Area (acres)	Donated (acres)	Easement (acres)
1	2573 East Cook Road	6.79	0.193		
2	2375 East Cook Road	14.08	3.39		
3	1 Energy Plaza Drive, EP10-P	5.058			0.037
	1 Energy Plaza Drive, EP10-P	10.398			1.44
4	401 Noah Lane	3.95	3.95		
	501 Noah Lane	0.76	0.76		
5	2510 East Cook Road	0.5	0.5		
	2510 East Cook Road	1.24	1.24		
6	3020 Polluck Road	0.46	0.46		
7	3030 Polluck Road	0.45	0.45		
8	3303 East Baldwin Road	354.65		15.45	
	3303 East Baldwin Road	80.65		2.93	
		Total	10.943	18.38	1.477
	Total ROW Impact Area	30.8			

Source: Rowe Professional Services Company, 2016.

1498 Figure 6-2. Alternative – A Right-of-Way Impacts



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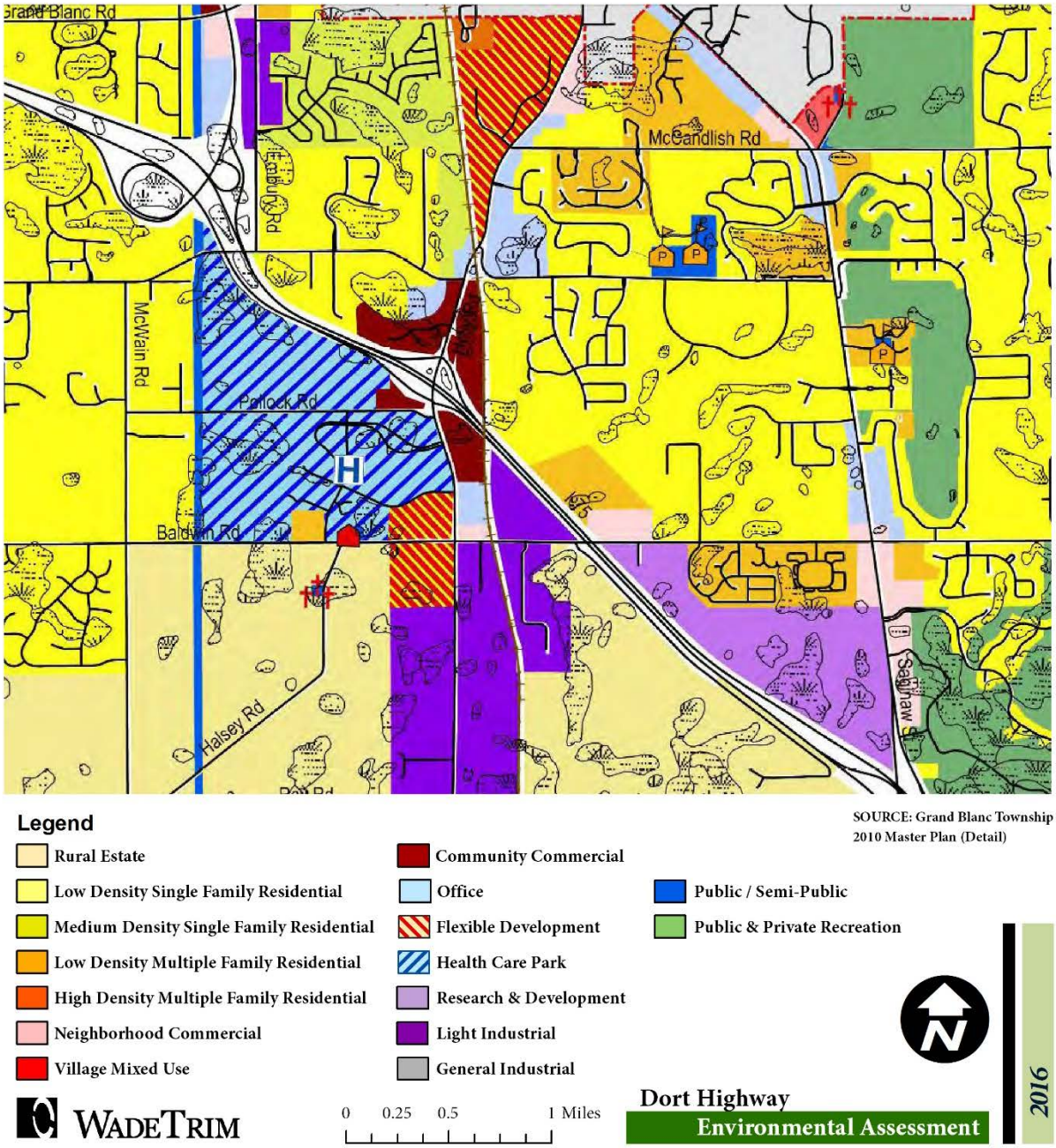
6.3 FARMLAND AND AGRICULTURE IMPACTS

No impacts associated with the U.S. Department of Agriculture 7 CFR Part 658 - Farmland Protection Policy Act are anticipated. Most of the ROW for the proposed roadway will be donated by Genesys Health Park. Additional ROW will need to be acquired north and south of Pollock Road and Cook Road, south of the Dort Highway/I-75 intersection. Additional ROW, easements and right-of-entry required for the Preferred Alternative is 30.8 acres.

The U.S. Department of Agriculture's Natural Resources Conservation Service, under Part 523 of the Farmland Protection Policy Act, reviewed the proposed Dort Highway project to determine the effect(s) that the proposal may have on prime and/or unique farmland. Subpart B of part 523 of the Farmland Protection Policy Act states that lands identified as "urbanized area" (UA) on the Census Bureau maps, as shown in Figure 6-5, are not covered by the Act. The project area extends south to Baldwin Road where the UA boundary ends. Since the area of the proposed project is within the UA on the 2010 Census Bureau reference map for Flint, Michigan, it is concluded that this project will have no negative impact on prime and/or unique farmland.

1515 Figure 6-3. Grand Blanc Township Land Use Plan Map



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1517 Figure 6-4. Grand Blanc Township Zoning Map

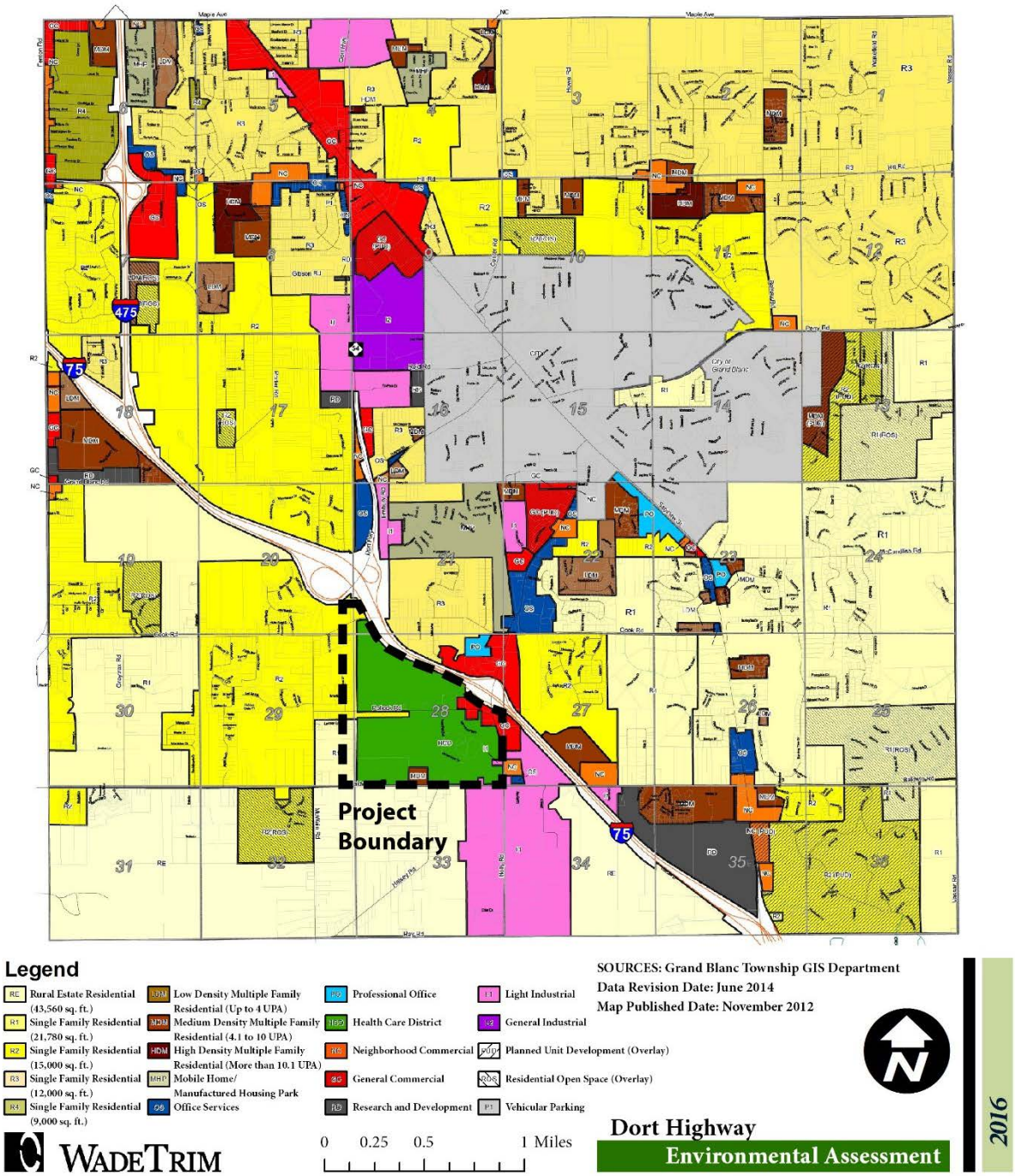

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Figure 6-5. Flint, MI, Urbanized Area

6.4 SOCIAL AND ECONOMIC IMPACTS

The Genesee County Road Commission (GCRC) proposes to extend approximately one mile of Dort Highway from I-75 to Baldwin Road in southern Genesee County, Michigan. Dort Highway is classified as an urban principal arterial. However, the proposed Dort Highway project area currently has rural characteristics south of I-75. Generally, Alternative A, the preferred alternative for the proposed Dort Highway, extension follows an existing Consumers Energy utility easement.

6.4.1 Social

An evaluation of the social impacts was made based on U.S. Census Bureau population and demographic data, existing and future land use data, and an inventory of public and semi-public facilities using GIS-based, property appraiser, and local directory data. The evaluation of social impacts resulted in the following findings.

Demographics

According to data from the U.S. Census Bureau's 2009-2013 American Community Survey (ACS) for Census Tract 111.02, which contains the proposed Dort Highway project, no minority groups are located immediately adjacent to the project. An estimated 82% of the population adjacent to the project reported their race as "white" and "not Hispanic or Latino." Less than 3% of the population adjacent to the project reported their ethnicity as "Hispanic." An estimated 10% of the population (524 people) is below poverty level. However, extreme low-income areas are absent from the immediate area.

The ACS estimates that more than 90% of workers in the area drive alone to work indicating there are relatively few transportation disadvantaged individuals and nearly none of the population relies on public transit. The project is not anticipated to adversely impact elderly persons, handicapped individuals, non-drivers, transit-dependent individuals or minorities. The provision of a shared-use path and sidewalks as part of the proposed Dort Highway extension will improve connectivity and support the future provision of transit services, potentially enhancing community cohesion. Grand Blanc Township has adopted a Pathways Master Plan in the 2013 Supplemental Amendment to the master plan. The non-motorized plan as detailed in this plan includes the proposed Dort Highway non-motorized path as a key component of connections to township facilities as well as the Genesys Health Park campus and the surrounding neighborhoods and services planned within the Technology Village Plan for the area. Appendix M has a copy of the plan for reference.

Community Cohesion

Roadways have the potential to create a psychological, if not a physical barrier, to social interaction between people and places on opposite sides of the roadway. To mitigate Dort Highway's barrier to social interaction, the proposed new extension from I-75 to Baldwin Road will provide a 10-foot-wide shared-use path on one side and a periodic five-foot sidewalk on the other side that do not exist in southern Genesee County. These elements will potentially increase pedestrian mobility to and from surrounding neighborhood and commercial areas.

Currently, major trip generators in the area, both at I-75 and Baldwin Road, are auto-oriented in their design and setback from existing roadways. Moreover, the existing residential pattern is characterized by low-density, cul-de-sac neighborhoods that are internally-oriented except for several properties on Pollock Road and McWain Road, that abut those roadways directly. Because the Preferred Alternative for the Dort Highway extension will avoid existing residential neighborhoods, no direct impacts or displacement to these neighborhoods are anticipated.

Planning tools, including the Grand Blanc Township Master Plan (2013 Supplemental Amendment), are in place to promote development in the project area to enhance community cohesion through place-making and the creation of activity centers. The Township's planned Technology Village, which includes the Genesys Health Park's campus, identifies the extension of Dort Highway as a key component to economic development.

Safety

Within a mile of the project, there are significant community assets including four churches, a fire department, and a major-medical center with ancillary uses.

Several places of worship are located on or near Baldwin Road in proximity to the proposed Dort Highway project: Halsey United Methodist Church, 10006 Halsey Road, Grand Blanc, MI 48439; Mt. Hope Church, 8363 Embury Road, Grand Blanc, MI 48439; Assumption Greek Orthodox Church, 2245 East Baldwin Road, Grand Blanc, MI 48439; and Grand Blanc Islamic Center, 1479 E Baldwin Road, Grand Blanc, MI 48439. Access to these facilities will be preserved as part of the proposed Dort Highway extension. No additional places of worship were identified within a mile of the project.

Genesys Health Park, a major healthcare facility and campus under construction, is located at the southern terminus of the proposed Dort Highway corridor. Genesys Health Park is one of the major employers in Genesee County and is currently constrained in terms of access to I-75. Currently, the only interstate access to Genesys Health Park is at the Holly Road interchange (Exit 108). The extension of Dort Highway would positively impact Genesys Health Park, improving outpatient access and emergency response times. The Dort Highway extension will also improve multi-modal connectivity with pedestrian and non-motorized improvements.

No elementary, middle, or high schools are near the project area. No colleges or universities are within a mile of the project.

Community Goals/Quality of Life

Grand Blanc Township initiated a Technology Village concept in 2008 with the Technology Village Area Plan Amendment in 2013. The planning area consists of approximately 4,103 acres in the south-central portion of the Township. The boundaries of the Technology Village Planning Area encompass half of the Township's frontage along I-75 including the proposed Dort Highway project area. Property in this prime location has been master planned for future light industrial and research and development.

The Dort Highway extension to Baldwin Road, which was not previously reflected in the Township's Thoroughfare Plan, is now part of the 2012 Master Plan update.

Genesee County also has a Regional Trail Plan. A proposed trail along the Dort Highway corridor will expand the Township's trail system providing increased non-motorized connectivity between Township facilities. Planning for non-motorized pathways is intended to increase opportunities for multi-modal transportation, a concept that will be central to development of the Technology Village Area.

6.4.2 Economics

The potential economic impacts of the proposed improvements were reviewed in the context of the respective Master Plans for Grand Blanc Township and Genesee County, the respective long-range transportation plan of Genesee County, and the *Freight and Connectivity Study (2009)*.

Commerce

Dort Highway provides a regional linkage to commerce centers in southern Genesee, northern Oakland, and northeastern Livingston counties. It also provides an important jobs-housing link by connecting the Genesys Health Park to residential developments in proximity to I-75 and south of Baldwin Road. The Dort Highway project could enhance existing and proposed opportunities for additional commercial, industrial, medical, and residential development in southern Genesee County.

Major commerce centers are positioned at the north and south ends of the project limits. These include ancillary medical offices at Genesys Health Park and industrial enterprises at the intersection of Holly and Baldwin roads. Access to these centers will be preserved as part of the proposed Dort Highway project, and visibility of these businesses will be enhanced. The Dort Highway extension will improve traffic flow and provide more opportunities to incorporate transit infrastructure into the road ROW.

The Dort Highway project will provide access to the western portion of the Genesys Health Park's campus. This will allow Genesys Health Park the ability to develop the Life Science Research and Development campus which is projected to provide 4,000 new high-tech jobs in the region.

The Dort Highway project will also facilitate the expansion of Continuing Care Retirement Community at Genesys Health Park while also providing relief for traffic congestion in the area with continued growth as Meijer, Inc. and other employers move into the Holly Road/Baldwin Road corridor. In recent years, other commercial/industrial development proposals have been interested in development opportunities in the area.

The quality of service provided by Dort Highway has a direct economic impact on the people who live and work not only in Genesee County but on those who use I-75 to travel or transport goods regionally. Dort Highway has been identified in regional transportation plans and by the *Freight and Connectivity Study (2009),* meaning that the corridor is critical for freight movement both locally and regionally.

Tax Base

Overall, the future land use designations and zoning districts adjacent to the corridor support the trend toward further commercialization of the corridor, with increased residential density ancillary to commercial development. The Technology Village, a future land use designation of the Grand Blanc Township Master

Plan, underscores the economic role of the Dort Highway corridor for Grand Blanc Township and southern Genesee County, as well as the region.

At present, areas south, east, and west of the proposed Dort Highway project contain vacant land that, when developed, will greatly increase the tax base for Grand Blanc Township and Genesee County. Greater access to regional commerce centers has the potential to incentivize the development of desirable commercial and residential projects consistent with the aforementioned plans and villages.

6.5 Environmental Justice

The Environmental Assessment considered potential impacts to environmental justice. Data was collected regarding community cohesion including the potential for social isolation, neighborhood bisection, impacts to special populations (elderly, disabled, etc.), and disparate impacts to minority groups. The purpose of Executive Order 12898 on Federal Actions to address Environmental Justice in Minority and Low-Income Populations is to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations.

No impacts to residential neighborhoods are anticipated because of the Preferred Alternative, and no neighborhoods will be divided by the proposed project.

Existing neighborhoods are located to the west of Dort Highway. At Pollock Road, approximately 12 residences are located east of Dort Highway on Pollock Road. However, these residences are already bisected from nearby neighborhoods by the existing utility easement. Other developments east of Dort Highway are characterized by non-residential uses (e.g. healthcare offices ancillary to the Genesys Health Park). These developments are already isolated from neighborhoods to the north by the existing I-75 corridor.

Several churches are located near the proposed Dort Highway project. However, none are located directly on the alignment and therefore, none will be severed from their adjacent neighborhoods. No public community centers or parks are located along the alignment. It is anticipated that Dort Highway will not impact community cohesiveness, but it will provide additional multi-modal connectivity to activity centers north and south.

The U.S. Census information shown in Table 6-2 indicates that, in general, Grand Blanc Charter Township has a lower percentage of minority populations and individuals below poverty level than Genesee County and the State of Michigan as a whole. In contrast, Grand Blanc Charter Township has a slightly higher percentage of individuals who may be limited in English proficiency.

Table 6-2. Census Information

Unit of Government	Total Population[1]	Percentage of Minority Populations[2]	Percentage of Individuals Below Poverty Level[2]	Percentage of Individuals Who May Be Limited in English Proficiency (LEP)[2]
Grand Blanc Charter Township	37,508	19.8%	9.8%	2.3%
Genesee County	425,790	27.4%	21.0%	1.0%
State of Michigan	9,883,640	21.0%	16.3%	9.0%

[1]*U.S. Census Bureau. 2010 Census Data*

[2]*U.S. Census Bureau. 2009-2013 American Community Survey*

The proposed Dort Highway project is contained within Michigan Census Tract 111.02. According to the 2009-2013 ACS, the estimated total population of this Census Tract is 5,205 people; with an estimated 2,286 households. The estimated median age of the Census Tract is 34.9 years. Less than 1% of the population (12 people) is 65 years and over, indicating that there are relatively few elderly persons living within the Census Tract.

Of the total population of the Census Tract, approximately 7% (352 people) has a disability of some kind. Of these persons with disabilities, approximately 5% are minorities. Of the total population of the Census Tract, less than 1% (4 people) speak English "less than very well" or is otherwise limited in English proficiency. Approximately 10% of the population (524 people) is below poverty level. Extreme low-income areas are absent from the immediate area.

No minority groups are located immediately adjacent to the project. Over 82% of the population adjacent to the project reported their race as "white" and "not Hispanic or Latino" according the 2009-2013 ACS. Less

than 3% of the population adjacent to the project reported their ethnicity as "Hispanic" according to the ACS.

According to the 2009-2013 ACS, an estimated 93% of workers residing in Census Tract 111.02 drive alone to work. Less than 5% carpool and nearly none use public transportation. Approximately 70% of workers residing in the area travel less than 30 minutes to work.

Construction of the proposed Dort Highway project will likely take two years to complete. Access to area businesses and residents will be maintained during construction. The proposed project will have no negative long-term effect on the local economy or tax base in the area.

Once completed, the proposed Dort Highway project is not anticipated to adversely impact elderly persons, handicapped individuals, non-drivers, or transit-dependent individuals. The project is not expected to cause high and adverse human health or environmental effects on minority and low-income populations. However, the proposed project will cause temporary impacts to residents, businesses, community services, motorists, and emergency services during the construction phase. Although there will be temporary impacts to these populations, the proposed project will provide benefits once construction is completed. The proposed project will help improve multi-modal connectivity to areas north and south, including improved access to I-75 and Baldwin Road.

A review of the Michigan State Housing Development Authority subsidized housing directory for Genesee County indicates that there is no subsidized housing, which includes Section 8, public housing and Section 236, in the study area.

Although the proposed project will neither displace nor cause disproportionate effects on minority and low-income populations within the project area, a continuing effort will be made to identify any additional impacts that may have a disproportionately high and adverse effect on minority and low-income population groups during the project. If additional impacts are identified, every effort will be made to actively involve the impacted groups in the project development process.

The proposed Dort Highway project may benefit all Grand Blanc Township residents by reducing traffic congestion and providing positive economic impacts. In addition, the proposed non-motorized path

following the extension will provide additional recreational opportunities to the area's residents and workers. However, temporary short-term impacts may occur during roadway construction such as increased construction noise, increased traffic volumes on adjacent local roads, and travel delays during the construction of Dort Highway.

6.6 PEDESTRIAN NON-MOTORIZED

Existing, planned, and priority pedestrian, bicycle and transit facilities were identified, as well as existing and prioritized recreational trail opportunities. All the build alternatives (Build Alternatives A, B, and C) would advance the non-motorized connectivity in the surrounding area and be consistent with the local and regional non-motorized planning completed by the local units of government. The following provides greater details of the specific elements of the plans to be advanced by the build alternatives.

6.6.1 Accessibility

The area between I-75 and Baldwin Road, where Dort Highway is proposed (Census Tract 111.02), has relatively low percentages of persons with disabilities and persons that do not drive or exclusively use public transit. The proposed shared-use path and sidewalk to be provided as part of the proposed Dort Highway project, will support potential transit service along the Dort Highway corridor. Current transit access is via Holly Road to the east.

6.6.2 Connectivity

Pedestrian and non-motorized travel will be enhanced by construction of Dort Highway. Pedestrian and bicycle facilities will be provided in the form of a non-motorized path and sidewalks as part of the proposed Dort Highway project. The proposed location of the non-motorized path is shown in Figure 3-3. Typical proposed road sections that include the non-motorized path and sidewalks are provided in Figure 5-1.

The non-motorized path will be 10-feet-wide and allow for shared-use. The non-motorized path will be constructed on the east side of the Preferred Alternative (Build Alternative A), from Cook Road to Baldwin Road, and connected to the existing Genesys Health Park trail system on the east side of the Preferred Alternative just south of Pollock Road. A new trailhead connection is also proposed in conjunction with the Preferred Alternative. The non-motorized path associated with the Preferred Alternative also includes potential connections to the future Grand Blank Township non-motorized path at Cook Road (at the north) and Baldwin Road (to the south).

The *Grand Blanc Township Pathways Master Plan* (2009), *Charter Township of Grand Blanc Supplemental Amendment Master Plan* (2013) – Appendix M, and *Genesee County Regional Non-Motorized Plan* (2014) all identify Dort Highway as part of a future pathway/trail system, with the latter document identifying Dort Highway as a "preferred corridor" for integration of bike lanes and other non-motorized pathways. The shared-use path and sidewalks provided as part of the proposed Dort Highway project will support access to trails south of Baldwin Road should such trails be constructed in the future.

The Genesys Health Park campus has a network of over six miles of pedestrian paths either constructed or planned. Currently, there are approximately 3.1 miles of existing trails in the Genesys Health Park area and the *Genesee County Regional Non-Motorized Plan* (2014) identifies the Genesys Health Park as a potential future trailhead for the larger, regional trail network.

The non-motorized path and sidewalks proposed in conjunction with the Preferred Alternative (Build Alternative A) will improve access to and between existing residential neighborhoods, as well as to and between employment centers, including Genesys Health Park and ancillary commercial development. Connecting the future Grand Blanc Township trail system and existing Genesys Health Park pathway system to the proposed non-motorized path shown in Figure 3-3 will be a significant improvement for connectivity in the region.

6.6.3 Traffic Circulation

Because of potential growth in the region resulting in population and traffic increases, additional strain will be placed on the transportation system to meet the needs of emergency vehicles, access to businesses, schools, churches, and community centers. Meeting these local and regional economic demands will require the extension of Dort Highway from I-75 to Baldwin Road. The proposed project along the western edge of the Genesys Health Park would benefit the Township by taking vehicles off of Holly Road between Hill and Baldwin roads. Holly Road is currently carrying an estimated 21,000 vehicles daily. Additional capacity will enhance the facility's roles as a major north-south arterial in Genesee County, an important connecting facility to I-75, and a multi-modal corridor. The addition of transit stops along the corridor will enhance connectivity to this employment center for the population served by regional mass transit.

6.7 PARKS AND RECREATION – 4(F) PROPERTIES

As stated in the original Section 4(f) legislation of 1966 and its revisions (1968 and 1983), Section 4(f) protects the following basic types of properties: publicly owned park and recreation areas that are open to the general public, publicly owned wildlife and waterfowl refuges, and public or privately owned historic sites. No impacts are anticipated to any public recreational property protected under Section 4(f) of the Department of Transportation Act. No public recreational properties have been identified directly adjacent to or near the proposed project area (i.e., within one mile); therefore, no public facilities, services, managed conservation areas, parks, trails, or bikeways will be negatively affected by the project.

One private recreational facility is located near the project at Genesys Health Park and functions as an open-membership health club (Genesys Health and Fitness Center) with a variety of fitness amenities. This facility will not be impacted by the proposed Dort Highway project. Additionally, there are a number of trails (3.1 miles) within the Genesys Health Park area. However, these will not be impacted by the proposed Dort Highway project.

6.8 EFFECTS ON AIR QUALITY

Impacts of the proposed project to the air quality in the study area are discussed in this section.

6.8.1 Vehicle Emissions

The impact resulting from a new transportation project ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new roadway or an existing highway facility.

Criteria Pollutants

Motor vehicles emit carbon monoxide (CO), nitrogen oxide (NO_2), volatile organic compound (VOC), particulate matter (PM_{10}) and ($PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb) (listed in order of decreasing emission rate). Emissions of criteria pollutants as a result of the implementation of the project are discussed below.

Carbon Monoxide

Motor vehicles are considered a main source of CO in the study area (Environmental Protection Agency, 2011). CO levels measured near the study area are well below the National Ambient Air Quality Standards (NAAQS), and this project is not expected to produce a projected violation of the CO NAAQS.

Projects in attainment areas would still be required to conduct a CO hotspot analysis if the project is expected to affect intersections that are at Level of Service (LOS) "D," "E," or "F" or those that would change the LOS of an intersection to "D," "E," or "F" due to increased traffic volumes related to the project (40 CFR 93.123). The proposed project would relieve congestion at the Holly Road interchange and roundabouts would be constructed at new intersections. The proposed project is not anticipated to cause adverse impacts on intersections and local air quality, therefore, no additional project-level analysis is required.

Ozone & Nitrogen Dioxide

Motor vehicles are regarded as sources of VOC and NO_2. VOC and NO_2 emitted from vehicles are carried into the atmosphere where they react with sunlight to form O_3 and NO_2. Automotive emissions of VOC and NO_2 are expected to decrease in the future due to the continued installation and maintenance of pollution control devices on new cars. However, regarding area-wide emissions, these technological improvements may be offset by the increasing number of cars in the area.

The photochemical reactions that form O_3 and NO_2 require several hours to occur. For this reason, the peak levels of O_3 generally occur 10 to 20 kilometers (approximately 6 to 12 miles) downwind of the source of VOC emissions. Urban areas as a whole are regarded as sources of VOC, not individual streets and highways. The emissions of all sources in an urban area mix in the atmosphere, and in the presence of sunlight, this mixture reacts to form O_3, NO_2, and other photochemical oxidants. Genesee County is in attainment of O_3 NAAQS (EPA 2016i). This project is not expected to cause adverse impact on O_3 or NO_2 concentrations.

Particulate Matter & Sulfur Dioxide

Motor vehicles are not regarded as significant sources of PM_{10}, $PM_{2.5}$, and SO_2. Nationwide, highway sources account for less than 7% of PM emissions and less than 2% of SO_2 emissions. PM_{10}, $PM_{2.5}$, and SO_2 emissions are predominantly the result of non-highway sources (e.g., industrial, commercial, and

agricultural). Because emissions of PM_{10} and SO_2 from automobiles are very low and current monitored levels are well below the NAAQS, the traffic on the project will not cause air quality standards for PM_{10} and SO_2 to exceed the NAAQS. The study area is in attainment of PM_{10} and SO_2 NAAQS (EPA 2016i).

Projects in $PM_{2.5}$ nonattainment areas that has a significant number of diesel vehicles is anticipated to significantly increase the number of diesel vehicles, to affect intersections that are LOS "D," "E," or "F," or to change the LOS of an intersection to "D," "E," or "F" are required to conduct a hotspot analysis (40 CFR 93.123). Projects that involve bus and rail terminals are often subject to this requirement due to increase in diesel use. Facilities with annual average daily traffic (AADT) greater than 125,000 with 8% or more of that AADT as diesel trucks is considered to be significant (71 FR 12468). The study area is in attainment of $PM_{2.5}$ NAAQS, the AADT of this project is less than 125,000, and the truck percentage is 4% (EPA 2016i, MDOT 2015). The project is not expected to cause a significant increase in the number of diesel vehicles. Therefore, a $PM_{2.5}$ hotspot analysis is not required.

Lead

Automobiles without catalytic converters can burn regular gasoline. The burning of regular gasoline emits Pb as a result of regular gasoline containing tetraethyl lead, which is added by refineries to increase the octane rating of the fuel. Newer cars with catalytic converters burn unleaded gasoline, thereby eliminating Pb emissions. Also, the EPA has required the reduction in the Pb content of leaded gasoline. The overall average Pb content of gasoline in 1974 was approximately 0.53 gram per liter. By 1989, this composite average had dropped to 0.003 gram per liter. The CAA (Clean Air Act) Amendments of 1990 made the sale, supply, or transport of leaded gasoline or Pb additives unlawful after December 31, 1995. Because of these reasons, it is not expected that traffic on the proposed project will cause the NAAQS for Pb to be exceeded.

Mobile Source Air Toxics

Motor vehicles contribute significantly to emissions of acrolein, benzene, 1,3-butadiene, diesel PM (including diesel exhaust organic gases), formaldehyde, naphthalene and polycyclic organic matter. Of these compounds, FHWA considers diesel PM as the dominant mobile source air toxics (MSAT) of concern.

The FHWA has developed a tiered approach for analyzing MSATs in the National Environmental Policy Act documents, depending on the specific project circumstances:

- No analysis for projects with no potential for meaningful MSAT effects
- Qualitative analysis for projects with low potential MSAT effects
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

The proposed project involves building a new roadway and adding intersection modifications at an interchange. The design year AADT for the proposed connection is projected to be less than the 140,000 to 150,000 vehicles per day FHWA criterion for a qualitative analysis. The project is expected to have low potential MSAT effects. Vehicle mix is not anticipated to change due to this project. Therefore, MSATs emitted would be proportional to the vehicle miles traveled (VMT). The estimated daily VMT for this project is 0 in the current year and 20,280 vehicles in the year 2040. Also, speed may increase due to additional capacity increasing the efficiency of the transportation network.

EPA's national control programs are projected to reduce annual MSAT emissions by over 80% from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turn over, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great, even after accounting for VMT growth, that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

MSAT science is still evolving and the available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternative evaluated in the Environmental Impact Statement. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality regulations (40 CFR 1502.22) regarding incomplete or unavailable information.

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation, rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute.

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that timeframe, since such information is unavailable. It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways, to determine the portion of time that people are actually exposed at a specific location, and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds and, in particular, for diesel PM.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could

result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities, plus improved access for emergency response, that are better suited for quantitative analysis.

6.8.2 Construction Emissions

Heavy construction equipment, including excavators, scrapers, graders, rollers, compactors, and pavers, may be used to clear and grub, excavate, grade, and pave for construction of new roadways. Contractors will be responsible for maintaining, repairing, and adjusting all construction equipment to keep them in full satisfactory condition to minimize pollutant emissions. Equipment emissions may be reduced by using newer, lower-emitting equipment, retrofitting older equipment engines, and controlling emission producing activity.

Measures should be taken to reduce any fugitive dust generated by construction activities. A dust control plan may be prepared to outline control methods specific to the construction site. Dust control methods may include watering areas of disturbance, covering haul trucks, stabilizing construction access roads, covering stockpile areas, washing equipment to minimize track out, and reducing speeds on unpaved roads.

6.8.3 Conclusions

The study area is located in Genesee County. Genesee County is in attainment of all NAAQS. Transportation conformity applies to nonattainment and maintenance areas; therefore, transportation conformity does not apply to this project.

The project does not involve a significant number of diesel vehicles and is not anticipated to significantly increase the number of diesel vehicles, affect intersections that are LOS "D," "E," or "F," or change the LOS of an intersection to "D," "E," or "F." Therefore, the project would not be required to conduct a project-level hotspot analysis for CO or $PM_{2.5}$.

No significant MSAT impacts are anticipated from this project. Air toxics analysis is a continuing area of research. At this time, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited.

6.9 NOISE IMPACTS

A traffic noise impact analysis was completed to identify all traffic noise impacts, and in accordance with MDOT's *Noise Analysis and Abatement Handbook (2011)*, present the recommendations for, or against, the construction of traffic noise abatement measures for the proposed Dort Highway project. This analysis evaluated the existing ambient noise levels at noise monitoring locations and the assessment of predicted

loudest-hour equivalent existing, No-Build and Build condition traffic noise levels and traffic noise impacts at 184 receptors in the vicinity of the project. Three build alternatives – Alternative A (Preferred Alternative, new road with roundabout or T-intersection), Alternative B (new road with roundabout or T-intersection), and Alternative C (the existing McWain Road corridor alignment) – were evaluated in the traffic noise impact analysis.

In 2040, the noise levels are anticipated to increase with or without the proposed project. Based on the analysis, the Alternative A would result in 4 impacts and Alternative B would have 3 impacts. Alternative C is expected to have 6 impacts. Due to the close proximity of receptors on McWain Road, Alternative C results in more impacts and residents along McWain Road are expected to experience an increase in noise levels due to increase traffic. Residents can expect an approximate increase up to 10dBA in some areas within the study area. Driveways are located along McWain Road, so an effective noise barrier is not a feasible option for mitigation. No abatement measures would be reasonable for these impacted receptors. Any subsequent project design changes may require a reevaluation of the noise impacts and abatement measures.

Construction noise impacts, some of them potentially extreme, will occur due to the close proximity of numerous noise-sensitive receptors to project construction activities. The traffic noise impact analysis recommends that all reasonable efforts should be made to minimize exposure of noise-sensitive areas to construction noise impacts. If construction persists for a period longer than 2 years and where impacts to nearby receptors are determined to be likely, construction noise abatement measures may be incorporated into the project. The Preferred Alternative has the least amount of noise impacts for the build alternatives.

6.10 Environmental Contamination

A limited environmental desktop review of the proposed Dort Highway extension was performed.

6.10.1 Structures and Other Improvements

Dort Highway contains over 100 distinct parcels of land. This area contains private residences, out-buildings, commercial structures, a hospital campus, paved roads, vegetated areas (wooded and grass lands), lowlands, roadside county ditches, ponds, and underground utilities (i.e., municipal water, sanitary

sewer, natural gas, electric, and communications). Alternatives A and B will involve the removal of three residential structures. Alternative C will involve the removal of at least two residential structures.

6.10.2 Utilities and Municipal Services

Utilities and services in the Dort Highway corridor provided by the following suppliers: Consumers Energy (Natural Gas and Electricity), Grand Blanc Township (Municipal Potable Water and Sewer), and Private (Wells and Septic).

6.10.3 Records Review

A review of reasonably ascertainable databases, historical records, and physical setting records was conducted to help identify environmental concerns at the Dort Highway corridor and, to the extent identifiable, at surrounding properties.

Physical Setting

Based on a review of various available sources regarding the geologic, hydrogeologic, hydrologic, and topographic characteristics that may affect potential contaminant migration to the study corridor, or within or from the study corridor, it is inferred that groundwater in the vicinity of the study corridor flows toward the north, with potential influence from the Swartz Creek Watershed. However, local manmade structures (e.g., buildings, roads, sewer systems, and utility service lines) may influence both surface water and groundwater flow. To determine the site-specific groundwater flow direction, subsurface information would be necessary.

Environmental

Current environmental database information is compiled by a variety of federal and state regulatory agencies. Data from these agencies was obtained to evaluate potential environmental risks associated with the study corridor, adjoining properties, and nearby sites that are: (1) identified on target lists and (2) within varying distances of up to one mile from the study corridor.

The following sites within the Dort Highway corridor are listed in regulatory databases:

- 8166 Embury Road, Grand Blanc II (FINDS)
- 8170 Embury Road, Barron Precision Instruments (FINDS, RCRA-SQG, WDS)
- 8018 Embury Road, Chippewa Management, LLC (FINDS, RCRA-CESQG, WDS)

- 8200 Embury Road, Loon Lake Precision (WDS)
- 8242 Embury Road, Bullet Engineering, LLC (FINDS, RCRA-NonGen/NLR, WDS)
- 8260 Embury Road, Premier Tooling (WDS)
- 1 Genesys Parkway, Genesys Regional Medical Center (FINDS, RCRA-SQG, WDS, MI-AST)

Due to the regulatory status of these sites and lack of records pertaining to a release of any hazardous substances and/or petroleum products, these listings do not represent an environmental concern to the study corridor. Moreover, based on locational and physical criteria, and a review of readily available database information, no nearby sites present a potential environmental risk to the study corridor.

6.10.4 Findings

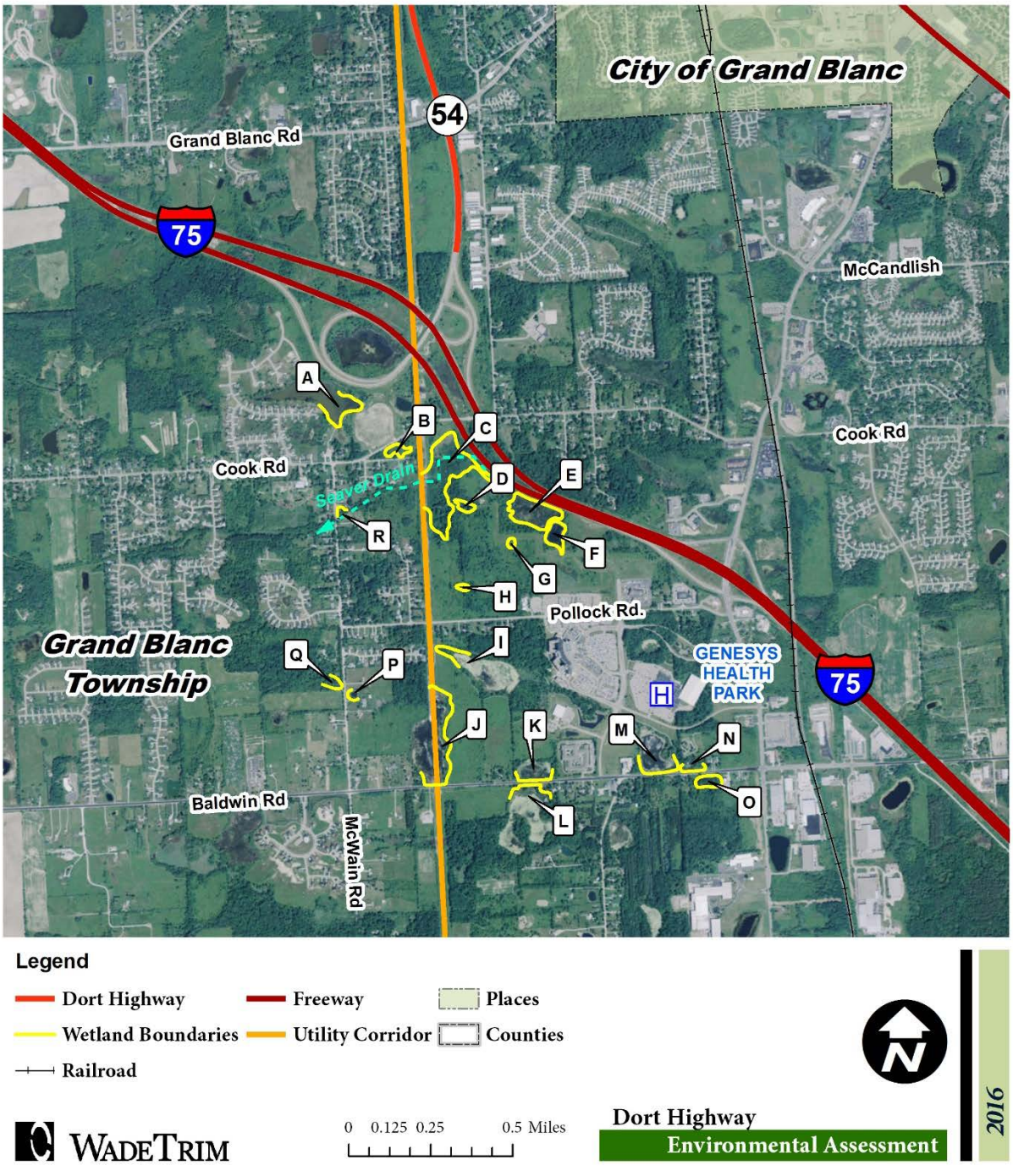
The limited environmental desktop review revealed no obvious evidence of Recognized Environmental Concerns in connection with the study corridor. No additional investigations are warranted to evaluate for the presence of contaminated soil, groundwater, air, or soil vapor. The Preferred Alternative and Alternative B will impact three structures and result in their removal.

In the event Alternative C is chosen as the proposed undertaking, at least two residential structures will be razed to complete the undertaking. A pre-demolition asbestos and other hazardous materials survey will be conducted. All asbestos containing materials and other hazardous materials will be abated and/or removed prior to demolition activities in accordance with applicable local, state, and federal requirements, including notification requirements.

6.11 WETLANDS

State and federal laws and regulations (Federal Order 11990 and Part 303 of Michigan Public Act 451 of 1994 as amended) protect wetlands and require that road construction avoid affecting wetlands when prudent and feasible. If impacts to a wetland are unavoidable, impacts must be minimized and mitigated by replacing lost acreage as closely as possible to and within the same watershed as the impacted wetland. A total of 18 wetlands were identified within the project corridor. Many of these wetlands extended beyond the study area. These wetland areas are briefly described below followed by a determination of their jurisdictional status. An aerial photograph with the surveyed wetland boundaries is shown in Figure 6-6.

2086 Figure 6-6. Wetlands



2087

6.11.1 Wetland A

Wetland A is a scrub-shrub wetland located along the banks of a lake just south of the Dort Highway/I-75 interchange. Evidence of hydrology included water marks and saturation visible on aerial imagery. Wetland A is assumed to extend to the west along the lakeshore beyond the area of investigation. Predominant wetland plants observed include:

Cornus foemina	Gray dogwood	Fac
Juncus effusus	Soft-stemmed rush	FacW+
Phalaris arundinacea	Reed canary grass	FacW+
Populus deltoides	Cottonwood	Fac

It is our opinion that Wetland A is regulated by the Michigan Department of Environmental Quality (MDEQ) because it is contiguous with an inland lake.

6.11.2 Wetland B

Wetland B is a scrub-shrub/emergent wetland complex located south of East Cook Road. Evidence of hydrology included sparsely vegetated concave surface, water-stained leaves and saturation visible on aerial imagery. Predominant wetland plants observed include:

Cornus foemina	Gray dogwood	Fac
Frangula alnus	Glossy buckthorn	Fac
Phalaris arundinacea	Reed canary grass	FacW+
Populus deltoides	Cottonwood	Fac
Typha x glauca	Narrow-leaved cat-tail	Obl
Ulmus americana	American elm	FacW

It is our opinion that Wetland B is regulated by the MDEQ because it is within 500 feet of the Seaver Drain.

6.11.3 Wetland C

Wetland C is a large, mixed, scrub-shrub/emergent wetland complex located south of East Cook Road and west of I-75. Evidence of hydrology included water marks and sparsely vegetated concave surface. The northern half of Wetland C was dominated by emergent species. The southern half contained an extremely dense, scrub-shrub community with a dominance of glossy buckthorn.

Wetland C extends to the west beyond the area of investigation. Predominant wetland plants observed include:

Asclepias incarnata	Swamp milkweed	Obl
Cornus foemina	Gray dogwood	Fac
Euthamia graminifolia	Grass-leaved goldenrod	Fac
Frangula alnus	Glossy buckthorn	Fac
Impatians capensis	Spotted touch-me-not	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Populus deltoides	Cottonwood	Fac
Typha x glauca	Narrow-leaved cat-tail	Obl
Ulmus americana	American elm	FacW
Verbena hastata	Blue vervain	FacW

It is our opinion that Wetland C is regulated by the MDEQ because it is contiguous with the Seaver Drain and assumed to be larger than 5 acres.

6.11.4 Wetland D

Wetland D is a small emergent wetland located to the east of, but does not appear contiguous with, Wetland C. Evidence of hydrology included surface water and water-stained leaves. Predominant wetland plants observed include:

Alisma subcordatum	Southern water-plantain	Obl
Carex lacustris	Sedge	Obl
Cornus foemina	Gray dogwood	Fac
Frangula alnus	Glossy buckthorn	Fac
Fraxinus pennsylvanica	Red ash	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Populus deltoides	Cottonwood	Fac
Typha x glauca	Narrow-leaved cat-tail	Obl
Ulmus americana	American elm	FacW

It is our opinion that Wetland D is regulated by the MDEQ because it is within 500 feet of the Seaver Drain.

6.11.5 Wetland E

Wetland E is a scrub-shrub/emergent wetland complex located west of I-75. Evidence of hydrology included surface water, water-stained leaves and water marks. Predominant wetland plants observed include:

Cornus foemina	Gray dogwood	Fac
Cornus sericea	Red-osier dogwood	FacW
Frangula alnus	Glossy buckthorn	Fac
Fraxinus pennsylvanica	Red ash	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Populus deltoides	Cottonwood	Fac
Typha x glauca	Narrow-leaved cat-tail	Obl

It is our opinion that Wetland E is regulated by the MDEQ because it is larger than 5 acres.

6.11.6 Wetland F

Wetland F is a scrub-shrub wetland on the banks of a lake located south of Wetland E. Evidence of hydrology included water marks and water-stained leaves. Predominant wetland plants observed include:

Cornus foemina	Gray dogwood	Fac
Phalaris arundinacea	Reed canary grass	FacW+
Populus deltoides	Cottonwood	Fac

It is our opinion that Wetland F is regulated by the MDEQ because it is contiguous with an inland lake.

6.11.7 Wetland G

Wetland G is a small emergent wetland found in a depression in a fallow field. Evidence of hydrology included water marks and water-stained leaves. Predominant wetland plants observed include:

Asclepias incarnata	Swamp milkweed	Obl
Cornus foemina	Gray dogwood	Fac
Euthamia graminifolia	Grass-leaved goldenrod	Fac
Phalaris arundinacea	Reed canary grass	FacW+
Populus deltoides	Cottonwood	Fac
Typha x glauca	Narrow-leaved cat-tail	Obl

Ulmus americana	American elm	FacW
Verbena hastata	Blue vervain	FacW

It is our opinion that Wetland G is not regulated by the MDEQ because it is smaller than 5 acres and not within 500 feet of an inland lake or stream.

6.11.8 Wetland H

Wetland H is another small emergent wetland found in a depression in a fallow field. Evidence of hydrology included surface water, saturated soils, water-stained leaves and water marks. Predominant wetland plants observed include:

Carex lacustris	Sedge	Obl
Cronus foemina	Gray dogwood	Fac
Cornus sericea	Red-osier dogwood	FacW
Onoclea sensibilis	Sensitive fern	FacW
Penthorum sedoides	Ditch stonecrop	Obl
Phalaris arundinacea	Reed canary grass	FacW+
Symphyotrichum novae-angliae	New England aster	FacW

It is our opinion that Wetland H is not regulated by the MDEQ because it is smaller than 5 acres and not within 500 feet of an inland lake or stream.

6.11.9 Wetland I

Wetland I is a scrub-shrub wetland located along the banks of a tributary to the Seaver Drain. Evidence of hydrology included sparsely water-stained leaves and saturation visible on aerial imagery. Wetland I extends east around the lake and beyond the area of investigation. Predominant wetland plants observed include:

Frangula alnus	Glossy buckthorn	Fac
Fraxinus pennsylvanica	Red ash	FacW
Lythrum salicaria	Purple loosestrife	Obl
Phalaris arundinacea	Reed canary grass	FacW+
Quercus bicolor	Swamp white oak	FacW

It is our opinion that Wetland I is regulated by the MDEQ because it is contiguous with an inland lake.

6.11.10 Wetland J

Wetland J is a scrub-shrub/emergent wetland complex along the shoreline of a lake located just north of Baldwin Road. Evidence of hydrology included standing water and saturated soils. Wetland J is assumed to extend around the lake shoreline to the west. Predominant wetland plants observed include:

Asclepias incarnata	Swamp milkweed	Obl
Cornus foemina	Gray dogwood	Fac
Euthamia graminifolia	Grass-leaved goldenrod	Fac
Fraxinus pennsylvanica	Red ash	FacW
Onoclea sensibilis	Sensitive fern	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Scirpus atrovirens	Bulrush	Obl
Typha x glauca	Narrow-leaved cat-tail	Obl
Ulmus americana	American elm	FacW

It is our opinion that Wetland J is regulated by the MDEQ because it is contiguous with an inland lake.

6.11.11 Wetland K

Wetland K is an emergent wetland associated with a small lake located north of Baldwin Road. Evidence of hydrology included standing water and saturated soils. Wetland K is assumed to extend around the lake shoreline to the north. Predominant wetland plants observed include:

Acer saccharinum	Silver maple	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Typha x glauca	Narrow-leaved cat-tail	Obl

It is our opinion that Wetland K is regulated by the MDEQ because it is contiguous with an inland lake.

6.11.12 Wetland L

Wetland L is an emergent wetland located south of Baldwin Road opposite of Wetland K. Evidence of hydrology included standing water and saturated soils. Wetland L extends to the south beyond the area of investigation. Predominant wetland plants observed include:

Acer saccharinum	Silver maple	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Typha x glauca	Narrow-leaved cat-tail	Obl

It our opinion that Wetland L is regulated by the MDEQ. This is based on the observation of aerial photography indicating it is part of a wetland system that is larger than 5 acres.

6.11.13 Wetland M

Wetland M is a mixed, emergent/forested wetland complex associated with a small lake located north of Baldwin Road. Evidence of hydrology included standing water and saturated soils. Wetland M is assumed to extend along the lakeshore to the north. Predominant wetland plants observed include:

Acer saccharinum	Silver maple	FacW
Cornus foemina	Gray dogwood	Fac
Fraxinus pennsylvanica	Red ash	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Symphyotrichum novae-angliae	New England aster	FacW
Typha x glauca	Narrow-leaved cat-tail	Obl
Ulmus americana	American elm	FacW

It is our opinion that Wetland M is regulated by the MDEQ because it is contiguous with an inland lake.

6.11.14 Wetland N

Wetland N is an emergent wetland located north of Baldwin Road and east of Wetland M. Evidence of hydrology included standing water and saturated soils. Wetland N extends to the north beyond the area of investigation. Predominant wetland plants observed include:

Phalaris arundinacea	Reed canary grass	FacW+
Typha x glauca	Narrow-leaved cat-tail	Obl

It is our opinion that Wetland N is regulated by the MDEQ because it is within 500 feet of an inland lake.

6.11.15 Wetland O

Wetland O is an emergent wetland located south of Baldwin Road. Evidence of hydrology included standing water and saturated soils. Predominant wetland plants observed include:

Acer saccharinum	Silver maple	FacW
Phalaris arundinacea	Reed canary grass	FacW+
Typha x glauca	Narrow-leaved cat-tail	Obl

It is our opinion that Wetland O is not regulated by the MDEQ because it is smaller than 5 acres and not within 500 feet of an inland lake or stream.

6.11.16 Wetland P

Wetland P is an emergent wetland fringe surrounding an excavated pond in a residential yard. Evidence of hydrology included standing water. Predominant wetland plants include:

Typha x glauca	Narrow-leaved cat-tail	Obl

It is our opinion that Wetland P is not regulated by the MDEQ because it is smaller than 5 acres and associated with an excavated pond.

6.11.17 Wetland Q

Wetland Q is a forested/scrub-shrub wetland complex located approximately 60 feet west of McWain Road. Evidence of hydrology included standing water and saturated soils. Predominant wetland plants observed include:

Cephalanthus occidentalis	Buttonbush	Obl
Cornus foemina	Gray dogwood	Fac
Populus deltoides	Cottonwood	Fac
Quercus bicolor	Swamp white oak	FacW
Typha x glauca	Narrow-leaved cat-tail	Obl
Ulmus americana	American elm	FacW
Viburnum trilobum	Highbush cranberry	FacW

It is our opinion that Wetland Q is not regulated by the MDEQ because it is smaller than 5 acres and not within 500 feet of an inland lake or stream.

6.11.18 Wetland R

Wetland R is an emergent wetland north of and adjacent to the Seaver Drain. Evidence of hydrology included standing water and saturated soils. Predominant wetland plants observed include:

Glyceria striata	Fowl manna grass	Obl
Juglans nigra	Black walnut	FacU
Onoclea sensibilis	Sensitive fern	FacW
Populus deltoides	Cottonwood	Fac
Quercus bicolor	Swamp white oak	FacW
Salix nigra	Black willow	Obl
Typha x glauca	Narrow-leaved cat-tail	Obl
Ulmus Americana	American elm	FacW
Verbena hastata	Blue vervain	FacW

It is our opinion that Wetland R is regulated by the MDEQ because it is within 500 feet of the Seaver Drain.

6.11.19 Conclusions on Regulated Wetlands

Based on the results of field inspection and the review of available documentation, the area of investigation includes 13 of the 18 wetlands are regulated by the MDEQ under the Natural Resources and Environmental Protection Act (1994 P.A. 451), Part 303, Wetland Protection. Impacts to regulated wetlands require a permit from MDEQ. As noted previously, the MDEQ has the final authority on the determination and extent of regulated wetlands, lakes and streams in the State of Michigan. In addition, any impacts to Seaver Drain and the tributary to Seaver Drain would require approval from MDEQ under Part 301, Inland Lakes and Streams as well as the Genesee County Drain Commission.

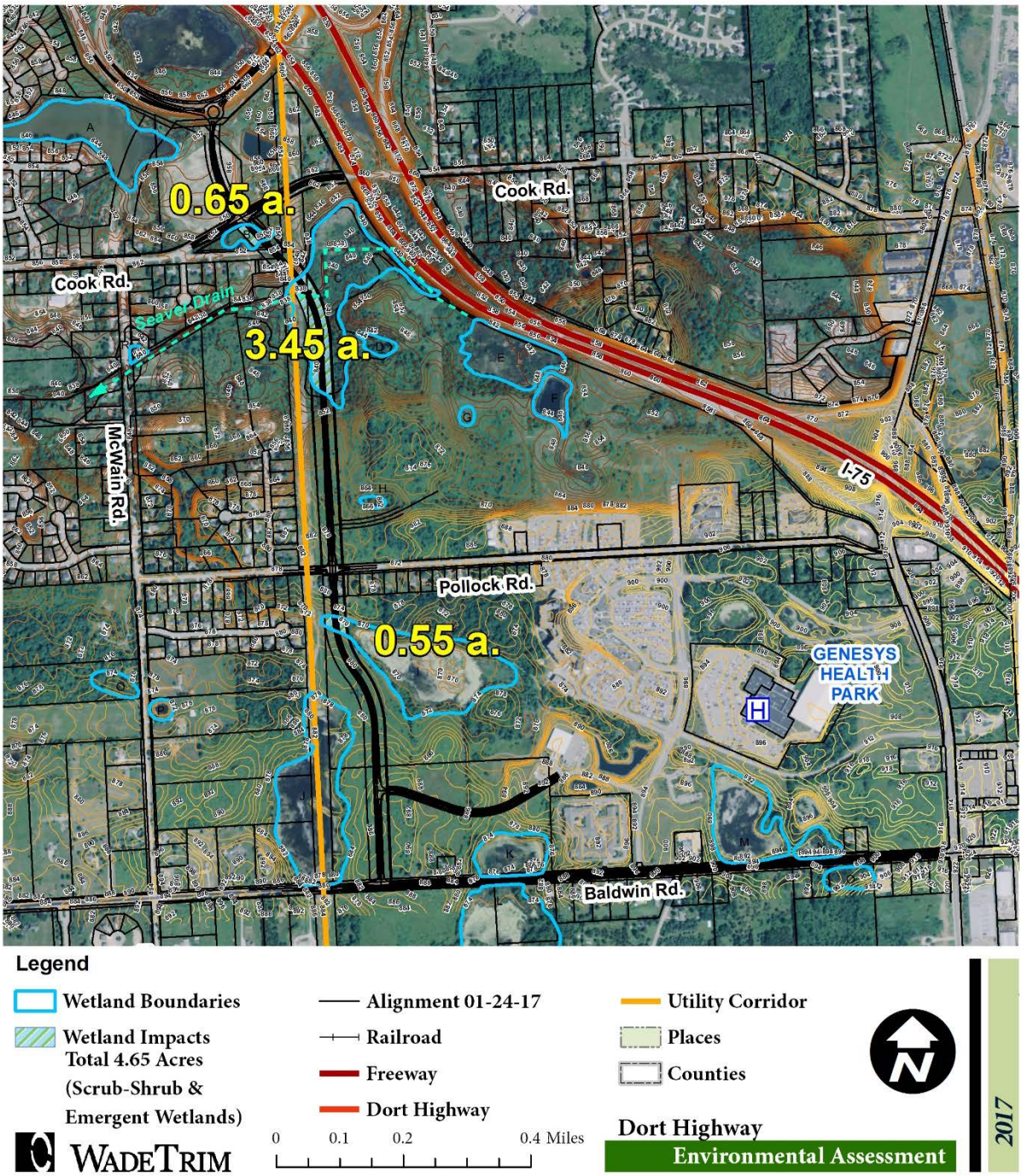
Executive Order 11990 (EO 11990) issued in 1977, requires federal agencies to “take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands”. There is not a permit process for compliance with EO 11990. To demonstrate compliance with the law as part of the NEPA document, the Applicant has identified the location of the wetlands (regardless of size) in the EA document for the study area and has acknowledged the proposed action is likely to have direct and indirect impacts associated with the filling or modifying of wetlands and has documented that the Preferred Alternative is the only “Prudent and Feasible Alternative” for the proposed alignment of the Dort Highway Extension. Mitigation may be required if, after avoiding and

minimizing impacts during the design phase, the proposed project results in impacts to wetlands. Specific measures to minimize harm and to compensate for losses from these wetland impacts will be documented by the applicant in the required permitting applications to be developed during the project design phase. The applicant will be required to assure at completion of design and permitting phase that the mitigation will result in no net loss of wetlands.

For the purposes of the environmental assessment, wetland impacts were assumed to be the wetland area mapped that was within the area of the preferred alternative right-of-way; as a worse-case scenario. Under this scenario, wetland impacts total 4.65 acres of scrub-shrub and emergent wetlands. Mitigation of these impacts at a ratio of 1.5 acres: 1 acres (Mitigation acres: Impact Acres) is assumed to be the minimum wetland mitigation requirement. Figure 6-7 Wetland Impacts provides the mapping of these impacts for the preferred alternative.

The requirements and mechanisms for compensatory mitigation for unavoidable wetland impacts may be accomplished through two distinct mechanisms in the State of Michigan. The first is permittee responsible mitigation plan conducted at the site of the permitted impacts or at an off-site location within the same watershed. The second is to secure mitigation credits through an approved regional wetland mitigation bank. The permittee, upon approval of the regulatory agencies, can purchase credits from a mitigation bank to meet their requirements for compensatory mitigation. The value of these credits is determined by quantifying the wetland functions or acres loss and purchasing equivalent wetland credits for restored or created wetlands at the mitigation bank. The bank sponsor is ultimately responsible for the success of the bank and relieves the purchaser from any additional monitoring and maintenance requirements associated with mitigation plan. Compensation for wetland losses is typically based on ratios of replacement wetland for those lost due to the action. Wetland mitigation must be of a similar ecological type as the impacted wetland.

Figure 6-7. Wetland Impacts



6.12 WATER QUALITY

6.12.1 Background

The Flint River Watershed is comprised of a network of tributaries draining approximately 1,332 square miles of southeast Michigan. The main river is approximately 142 miles in length and its basin contains portions of Oakland, Lapeer, Tuscola, Sanilac, Genesee, Shiawassee and Saginaw counties. The Flint River is a principle tributary of the Shiawassee River, which flows to the Saginaw River and Saginaw Bay of Lake Huron. Its major tributaries include the South and North Branch Flint rivers, and Kearsley, Thread, Swartz and Misteguay creeks.

The project is located in the Swartz Creek Watershed, a 129-square-mile area of land in southern Genesee and Oakland counties. The stream flows north approximately 15 miles from its headwaters in Oakland County into Genesee County, and ultimately to its confluence with the Flint River in the city of Flint. The headwaters in Oakland County are primarily dominated by forest and wetlands, and generally possess relatively good water quality and natural channel forms. As the stream flows north into southern Genesee County, water quality declines significantly as the landscape changes from forest and wetland land uses to agriculture and urban land uses (Swartz Creek Watershed Project, 2008). The entire project site is within the South Main sub-watershed (34.6 square miles) and a main tributary to Swartz Creek. Three Genesee County Drains are located within the project area and are part of the above noted sub-watershed including Seaver Drain, Trodalh Branch of Seaver Drain and Cames Drain, Figure 6-8 provides the locations for each of the above noted drains.

Figure 6-8. Drain Locations

6.12.2 Legal Requirements

Federal

The Federal Water Pollution Control Act (FWPCA), as amended (33 U.S.C. 1251 et seq; the "Federal Act"), provides the statutory basis for the National Pollutant Discharge Elimination System (NPDES) permit program and the basic structure for regulating the discharge of pollutants from point sources to waters of the United States. Section 402 of the FWPCA specifically requires EPA to develop and implement the NPDES program.

State

The Michigan Department of Environmental Quality has determined that Part 91 of the Michigan Natural Resources and Environmental Protection Act 451, Public Acts of 1994, as amended (the Michigan Act), Part 31 and Michigan Executive Orders 1991-31, 1995-4 and 1995-18, and Michigan's Permit by Rule (Rule 323.2190) are qualifying local programs for the control of wet weather discharges from construction activities that result in a land disturbance of greater than or equal to one acre.

Local

The Genesee County Drain Commissioners Office-Division of Water and Waste Services (GCDC-WWS) has been granted authority to administer and enforce Part 91, Soil Erosion and Sedimentation Control (SESC), of the Natural Resources and Environmental Protection Act 451 of 1994. The Genesee County Board of County Commissioners designated GCDC-WWS, by resolution, as the County Enforcing Agency (CEA). The CEA is responsible for controlling soil erosion and sedimentation for any earth change activity that is not exempt from obtaining a permit, pursuant to the aforementioned Act.

6.12.3 Water Quality Impacts

Total Maximum Daily Loads and Impaired Uses

Total Maximum Daily Loads (TMDLs) are required by the FCWA for water bodies that do not meet Water Quality Standards (WQS). A TMDL is developed by determining the maximum daily load of a pollutant that a water body can assimilate and still meet WQS. Genesee County's MS4 permit requires that the County develop, implement and enforce storm water management programs designed to reduce the discharge of pollutants to the maximum extent practicable, to protect the designated uses for the waters of the state, to protect water quality, and to satisfy the appropriate state and federal water quality requirements. If a water body has a TMDL, the maximum extent practicable includes the development, implementation, and

enforcement of storm water controls designed to meet the responsibilities established by the TMDL. The Genesee County Drain Commissioner requires implementation of Best Management Practices (BMPs) to comply with the minimum measures identified in the permit and any TMDLs if applicable. A TMDL for Swartz Creek and its tributaries has not been established, however, the watershed management plan documented two impairments to uses including warm water fisheries and other indigenous Aquatic Life and Wildlife. These impairments result from flow regime alterations from land development and other anthropogenic substrate alterations within the tributaries to the watershed.

The 2008 Swartz Creek Watershed Management Plan identified goals, objectives and implementation tasks to attain water quality goals. The goals for the implementation of the management plan include:

1. Protect and restore warm water fisheries.
    a. Reduce sedimentation from gully erosion sites.
    b. Reduce sedimentation from stream banks.
    c. Reduce sedimentation from road/stream crossings.
    d. Reduce sedimentation from broken/elevated outfalls.
2. Protect and restore Aquatic Life and Wildlife designated use.
    a. Reduce sedimentation from gully erosion sites.
    b. Reduce sedimentation from stream banks.
    c. Reduce sedimentation from road/stream crossings.
    d. Reduce sedimentation from broken/elevated outfalls
3. Protect the Partial and Total Body Contact recreation designated use.
    a. Reduce the presence of pathogens
4. Implement activities to attain other desired uses.
    a. Increase public access to Swartz Creek.
    b. Use stream corridor in “green way” system.
    c. Reduce the presence of oil and grease.
5. Positively affect water quality by implementing a public education campaign.
    a. Build and retain stakeholder awareness of the Swartz Creek Watershed.
    b. Educate stakeholders about the linkage between human activity and water quality.
    c. Motivate individuals to take actions to protect, preserve and restore water quality in the Swartz Creek Watershed.

Post-Construction Impacts

All of the Build Alternatives will increase impervious surfaces which will increase the volume and flow rates of runoff and sediment loads to the receiving surface waters. Management of this increase in runoff will be accomplished by implementing stormwater management controls to attenuate the flows from the roadway directed to the receiving waters as well as provide pre-treatment of the runoff; prior to discharging to the environment.

6.12.4 Mitigation Measures

To meet the goals of the Storm Water Management Plan, stormwater will be treated and the peak flow runoff volume reduced using a suite of stormwater best management practices before runoff enters any surface waters. Deploying stormwater management controls in this manner will improve the water quality of the receiving waters as well as reduce flow rates and runoff volume to prevent channel erosion for the receiving streams and drains.

Soil Erosion and Sedimentation Control During Construction

The GCRC will control accelerated sedimentation caused by construction before it enters the drains and wetlands or leaves the right-of-way by placement of temporary or permanent erosion and sedimentation control measures. The County has a Soil Erosion and Sedimentation Control (SESC) Manual with standard specifications and details to be included on design plans to prevent erosion and sedimentation. The design plans will describe the erosion controls and their locations. The following is a partial listing of general soil erosion and sedimentation control measures that will be carried out in accordance with permit requirements:

- Restrict work in the drain channels during periods of seasonally high water, except as necessary to prevent erosion. Restrict work in the stream to dates set forth in the MDEQ permits.
- Provide adequate sedimentation controls around the lakes and wetlands to provide necessary protection for aquatic life.
- Protect road fill side slopes, ditches, and other areas draining directly into the surface waters with riprap (up to three feet above the ordinary high water mark or season high water mark in wetlands) sod, seed, and mulch, or other measures, as necessary to prevent erosion.
- Stabilize and vegetate areas disturbed during construction activities within three days after final grading has been completed. Where it is not possible to permanently stabilize a disturbed area, appropriate

temporary erosion and sedimentation controls will be implemented. All temporary controls will be maintained until permanent soil erosion and sedimentation controls are in place and functional.

- The contractor shall have the capability to perform seeding and mulching at locations within 150 feet of any streams, drains and wetlands within 24 hours of being directed to perform such work by the Project Engineer.
- Protect the natural vegetative growth outside the project's slope stake line from removal or siltation. Natural vegetation, in conjunction with other sedimentation controls, provides filtration of runoff not carried in established ditches.
- Prevent the tracking of material onto local roads and streets. If material is tracked onto roads or streets, it shall be removed by the Contractor.

6.13 FLOODPLAINS AND HYDRAULICS

Federal and State laws regulate development impacts and encroachments into any floodway or the affect to any regulated floodplain. Floodplain impacts are reviewed under Part 31 of Public Act 451 and relevant administrative rules govern any occupation, construction, filling or grade change within the floodplain. Floodplain analysis must precede any potential impact and determine whether the project creates or increases a hazard to people or property and whether there is an impact on natural and beneficial floodplain values. These values include fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance and groundwater recharge. A floodplain is regulated by MDEQ if the point of interest has a contributing drainage area of greater than 2 square miles.

A new structure will carry Dort Highway over the Seaver Drain and will be sized to accommodate the bankfull flow as well as the required design storm events so that no harmful effects will occur to the surrounding properties and natural features. A detailed hydraulic analysis will be performed as part of the final design documents and utilized for permitting the encroachment into the floodplain and drain to ensure no adverse effects result from placing the road crossing. Any fill placed within the floodplain will be compensated with cuts and fills at a 1:1 ratio so that no change in the floodplain storage area results from the fill placed to build the road crossing.

6.14 Wild and Scenic Rivers or State Designated Natural Rivers

The Wild and Scenic Rivers Act of 1968 prohibits federal support for actions, such as the construction of dams or other in-stream activities that would diminish the river's free flow or outstanding resource values. Similarly, the goal of Michigan's Natural Rivers Program, formerly known as the Natural Rivers Act and now known as Part 305 of Public Act 451 of 1994, is to preserve and enhance a river's value for a variety of reasons including aesthetics, free flowing conditions, recreation, boating, water conservation, floodplain and fisheries and wildlife habitat.

There are no waterways that fall under the Wild and Scenic Rivers Act of 1968 or under the State of Michigan Part 305 of Public Act 451 of 1994.

6.15 Stream and Drain Crossings

All the Build Alternatives will result in one stream crossing at the Seaver Drain, a regulated inland stream, pursuant to MDEQ Part 301. Seaver Drain is also a designated County Drain with a mapped floodplain and therefore, will require coordination and permitting for any crossing by the Genesee County Drain Commissioner. Design of the crossing will need to meet design criteria and standards of the Drain Commissioner as well as MDEQ as prescribed in the Michigan Drain Code, Act No 98, Public Acts of 2013. Permanent encroachments in a County Drain will require a formal agreement and drain easement for maintenance. The road commission will be responsible for securing an agreement as part of the permit approvals.

6.16 Fish and Wildlife

A qualitative wildlife assessment was conducted when the wetland delineation was performed. During this assessment, listed fish and wildlife species were not observed. Detailed field surveys were not completed based on the limited resources identified at this advanced stage of project planning and design. Suitable habitat for the Indiana bat and the Eastern Massasauga is present in the area and we conclude that Indiana bats and Eastern Massasauga may be present. There are no records of listed federal or state species near the project limits. Additional coordination with the MDNR and USFWS during detailed engineering and design is expected to gain concurrence from these agencies that the proposed corridor extension may affect, but is not likely to adversely affect, the noted endangered or threatened fish and wildlife species.

6.16.1 Migratory Birds

No impact will occur as long as the provisions of the Migratory Bird Treaty Act regarding nest removal are followed when migratory birds are present. The Special Provision for Migratory Bird Protection will be part of the final plan package and implemented during construction.

6.17 Threatened and Endangered Species

6.17.1 General Information

Endangered and threatened species are officially protected by the State of Michigan's Natural Resources and Environmental Protection Act, Act 451 of the Public Acts of 1994, Part 365; and the Federal Endangered Species Act of 1973, as amended. An endangered species (E) under the Acts is defined as being in danger of extinction throughout all or a significant portion of its range. A threatened species (T) under the Acts is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Special Concern species (SC) are not afforded legal protection under the Acts, but are of concern because of declining or relict populations within Michigan or are species for which more information is needed.

6.17.2 Potential Species in Corridor

The potential occurrence of federally or state-listed threatened or endangered (T&E) species was evaluated based on information from U.S. Fish and Wildlife Service (USFWS), Michigan Department of Natural Resources (MNDR), and Michigan Natural Features Inventory (MNFI) websites. Federally-listed threatened and endangered species and federally-designated critical habitat receive protection under the Endangered Species Act. A review of the USFWS technical assistance website on September 17, 2015, for federally listed species in Genesee County, Michigan produced one endangered species and three threatened species. The protected species included the following species shown in Table 6-3.

Table 6-3. Threatened and Endangered Species in Genesee County

Common Name	Scientific Name	Listing Status
Plants		
Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	Threatened-Federal Endangered-State
Mammals/Reptiles		
Eastern Massasauga	*Sisturas catenatus catenatus*	Threatened-Federal
Indiana Bat	*Myotis sodalist*	Endangered-Federal
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened-Federal

Source: U.S. Fish and Wildlife Service, 2016.

Similarly, the MNFI database was accessed on December 7, 2016, to generate a list of legally protected species, special concern species, or other rare natural features potentially found within 1.5 miles of the study area (See Appendix A for MNFI Coordination Letter). The landscape within the corridor is generally characterized as rolling fallow fields with mixed stands of shrubs and trees. The topography is characterized as hummocks and hollows with scrub/shrub and forested fringes in wetlands and uplands and palustrine forested wetlands in kettle depressions. Impacts to this plant species are therefore not expected for the Preferred Alternative.

Critical habitat for the federally listed Eastern Massasauga, Indiana Bat or the Northern Long-eared Bat was not found during the records search. However, existing forested areas within the project corridor possess trees, notably; American Elm (Ulmus americana), Silver Maple (Acer saccharinum), and Cottonwood (Populus deltoides) that could possess roost characteristics and therefore could reasonably be expected to offer suitable habitat. However, the landscape position of the stands of trees are not in typical bottomland floodplains and contain heavy dense understory and margins. The Seaver Drain and Consumer Energy corridor offer some utility as travel corridors and since they are virtually absent of trees they could offer some value as foraging habitat for both species. Impacts in these areas will be limited to road crossings. Given these observations, the project may affect the listed species; however, the impacts could be managed to minimize effects to the listed species to the greatest extent possible by winter cutting (October 1-March 31) and clearing for the roadway extension to the immediate ROW needed to safely construct the required road section.

Based upon this review, no field surveys are expected. However, the GCRC will coordinate construction impacts with the Michigan Department of Natural Resources and the U.S. Fish and Wildlife Service as required. With the assumption that all potential adverse effects can be avoided; a Michigan Endangered Species Permit and/or USFWS Section 7 consultation is not expected to be a requirement for this project at this time.

6.18 Coastal Zone Resources, Critical Dunes, Coastal Barrier Resources, and High Risk Erosion Areas

Coastal Management in Michigan is part of a nationwide federal-state partnership established under the Coastal Zone Management Act (CZMA) of 1972. Coastal Management means achieving a balance between natural resources preservation and economic development along the Great Lakes region.

This project is outside of the Coastal Zone Management Boundary. Federal consistency review is not required.

6.19 Cultural Resources

To assess the sensitivity of the study area for cultural resources, including archaeological and cemetery/burial sites and architectural or historic resources, review of published literature and the state archaeological, architecture, and history site files was conducted in 2015 for a one-mile radius around the proposed Dort Highway expansion. This review involved examination of cultural resource survey reports and site files maintained at the State Historic Preservation Office (SHPO) in Lansing, Michigan. Online sources were also utilized, including the *National Park Service National Register of Historic Places* (NRHP) database (NPS 2016). Other sources included historic maps and primary or secondary historical and archaeological sources for the region, as well as published and unpublished archaeological survey reports. This information was used to ascertain the NRHP status of previously recorded resources and to assess the probability of identifying additional cultural resources in the survey corridor. Subsequently, in 2016, fieldwork was conducted once the Preferred Alternative was selected to supplement the research findings. Figure 6-9 shows the potential cultural resources within a one-mile radius of the proposed project. Appendix A provides a record of coordination with the State Historic Preservation Office stating that historic properties within the area of this project will not be affected.

Figure 6-9. Cultural Resources

6.19.1 Historic

Five properties were surveyed in the study area, three of which were determined to not meet the minimum age guidelines established by the NRHP; therefore, no further work was done on these properties. The following describes the two remaining properties and their historic relevance.

One previously surveyed above-ground property recommended eligible for listing on the NRHP was found to possibly intersect the study area:

- H.D. Cline House, 3505 East Cook Road (Survey #AG-001)

This property is located in close proximity to the eastern alternative, between the proposed ramp and the existing I-75 ROW. The house was originally recommended eligible for the NRHP under Criterion C as a good local example of the Colonial Revival style due to its high level of integrity. However, the house is not near the Preferred Alternative; therefore, no further work was recommended.

Another surveyed above-ground property was found to possibly intersect the study area, but was not recommended as eligible for listing on the NRHP due to low integrity:

- Former Farmstead Complex, 3107 Baldwin Road (east of McWain Road)

This property consists of a farmhouse and associated outbuildings and has been under various ownership since the 1800s. Although this property is in close proximity to the Preferred Alternative, the above-ground resources associated with the property lack sufficient integrity to meet any of the NRHP criterion of evaluation; therefore, no further work was recommended.

6.19.2 Archaeological

No previously recorded archaeological, cemetery, or burial sites were identified within or in close proximity to either alternative of the proposed Dort Highway project. Based on the presence of prehistoric lithic scatters within one-mile of the alternatives, the potential exists for the identification of additional prehistoric sites within undisturbed portions of the proposed Dort Highway alternatives.

Six archaeological sites and one cemetery are located within one-mile east of the proposed Dort Highway extension:

- South Grand Blanc Cemetery, 19th and 20th Century

- Lawrence Homestead, 19th and 20th Century (State Site #20GS111)
- Pollock Homestead I Farmstead, 19th and 20th Century (State Site #20GS112)
- Pollock Homestead II Farmstead, 19th and 20th Century (State Site #20GS113)
- Halsey Road School, 19th Century (State Site #20GS114)
- Lithic Scatter Sites, Prehistoric (State Site #20GS115 and #20GS116)

These six sites were identified by survey in 1993 (Dunham et al. 1993) and consist of three former residential or farmstead sites (20GS111, 20GS112, and 20GS113), the foundations of a former school building (20GS114), and two prehistoric lithic scatters (20GS115 and 20GS116). Following the 1993 survey, sites 20GS111, 20GS113, and 20GS114, and possibly 20GS111 and 20GS115, were destroyed by development. None of these sites were considered eligible for listing on the NRHP. The cemetery is located along the west side of Halsey Road, southeast of the southern terminus of the eastern alternative.

Fieldwork conducted in 2016, after the Preferred Alternative was selected, focused on the area not previously surveyed for archaeological resources in 1993, or the area corresponding to the Preferred Alternative between Cook Road and the I-75 ramp. This area currently consists of agricultural fields (soybean), existing highway on-ramps, dedicated drainage areas, wetlands, paved driveways and roadways, and manicured lawns. Fieldwork consisted of either shovel testing or visual inspection, depending on the risk of encountering unmarked utilities. During the fieldwork conducted in 2016, no archaeological materials were recovered and no features were identified within the area of the Preferred Alternative not previously surveyed in 1993. Due to extensive disturbance from the existing Cook Road and I-75 on-ramp construction, it is unlikely that archaeological sites would be discovered during a new construction project in the vicinity. No additional archaeological studies of the project area were recommended.

6.20 Indirect Impacts and Cumulative Effects

The Council on Environmental Quality regulations implementing the National Environmental Policy Act (NEPA) define indirect effects as those that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems (40 CFR 1508.8(b)). Cumulative effects are defined as those effects that have an impact on the environment which

results from the incremental impact of the action when added too other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

To determine possible indirect and cumulative impacts of the alternatives, the MDOT Five Year Highway and Bridge Program, Grand Blanc Township Master Plan and the Genesee County Planning Department and Metropolitan Planning Organization were reviewed as part of this study.

As was noted earlier, the continued development of Genesys Health Park is a primary driver for the need to make the extension of Dort Highway south to Baldwin Road. In addition, Baldwin Road extending west from the intersection of Holly Road/Baldwin Road has seen increased activity from the development community for new commercial, office and residential development. Grand Blanc Township has seen several proposals recently from interested developers. However, no formal plans have been submitted to date.

6.20.1 Impacts of the No-Build Alternative

Under the No-Build Alternative, future residential and commercial development projects will be considered as plans are advanced. With the No-Build Alternative, Genesys Health Park and other developers may be forced into decisions to delay planned expansion and development based on a lack of access points and adequate transportation infrastructure. The resulting road network will lack a comprehensive transportation strategy and stifle economic development in this area of the County. Development will likely occur at a slower rate until the tipping point is reached for safe and efficient access. The following table summarizes the impacts of the No-Build Alternative.

Table 6-4. Indirect and Cumulative Impacts Summary – No-Build Alternative

No-Build Alternative	Potential Impacts
Effects on Air Quality	The Study Area is in attainment of all NAAQS.
Effects on Threatened and Endangered Species	No direct impacts to any threatened or endangered species or their associated habitats.
Hazardous Waste	No affect to any contaminated sites.
Noise Impacts	3 Receptors would be impacted by 2040.
Wetland / Stream Impacts	No impacts to regulated wetlands or streams.
Water Quality Impacts	No Impacts to Seaver Drain.
Cultural Resources	No affect to cultural resources.
Section 4(f) Properties	No affect to 4(f) properties.
Land Use	No change to development patterns however, slowed growth and build-out is projected due to congestion and access issues.
Social Impacts	No social impacts. Except reduced job opportunities.
Facilities	No community facilities will be impacted.
Utilities	No utilities will be impacted.
Maintaining Traffic During Construction	No impacts.
Non-motorized and Transit	The No-Build Alternative will not allow for the extension of the non-motorized trail as planned in the local and regional non-motorized master plans.
Environmental Justice	The study area does not include minority or low-income populations.
Property Acquisitions and Displacements	No impact to properties along the corridor.
Visual Impacts	No impact to the visual quality of the study area.

6.20.2 Impacts of the Build Alternatives

Cumulative impacts of the Build Alternatives are not anticipated. The Build Alternatives will address the need for improving regional and local access to the Genesys Health Park for its employees and clients. The proposed road extension will create a connected road network to serve future planned development in the Township and improve access for the existing neighborhoods in a logical and comprehensive way. The following summarizes the impacts of the Build Alternatives.

2716 Table 6-5. Direct/Indirect and Cumulative Impacts Summary – Build Alternatives A, B, and C

Type	Build Alternative A Utility Corridor West Alignment (Preferred)	Build Alternative B Utility Corridor East Alignment	Build Alternative C McWain Road
Effects on Air Quality	No significant MSAT impacts are anticipated.	No significant MSAT impacts are anticipated.	No significant MSAT impacts are anticipated.
Effects on Threatened and Endangered Species	1 Endangered Species; 3 Threatened Species	1 Endangered Species; 3 Threatened Species	1 Endangered Species; 3 Threatened Species
Hazardous Waste	No affect to any contaminated sites.	No affect to any contaminated sites.	No affect to any contaminated sites.
Noise Impacts	4 receptors	3 receptors	6 receptors
Wetland / Stream Impacts and Floodplain Impacts	4.65 acres of Wetland and Stream Impacts / 3.61 acres of Floodplain	6.2 acres of Wetland and Stream Impacts / 3.47 acres of Floodplain	0.43 acres of Wetland and Stream Impacts / 5.02 acres of Floodplain
Water Quality Impacts	Seaver Drain Crossing	Seaver Drain Crossing	Seaver Drain Crossing
Cultural Resources	None	H.D. Cline House	None
Section 4(f) Properties	None	None	None
Land Use	All build alternatives will alleviate congestion and enhance access to the planned development and existing neighborhoods in the study area. Overall recreational options will be improved with planned non-motorized and transit options proposed in the study area.		
Social Impacts	None	None	Direct impacts to community cohesiveness of existing neighborhoods along McWain Road.
Facilities	No community facilities will be impacted.	No community facilities will be impacted.	No community facilities will be impacted.
Utilities	No utilities will be impacted.	No utilities will be impacted.	No utilities will be impacted.
Maintaining Traffic During Construction	Short-term impacts during construction are expected.	Short-term impacts during construction are expected.	Short-term impacts during construction are expected, with direct impacts to the existing neighborhoods along McWain Road.

Type	Build Alternative A Utility Corridor West Alignment (Preferred)	Build Alternative B Utility Corridor East Alignment	Build Alternative C McWain Road
Non-Motorized and Transit	All build alternatives propose improvements to the non-motorized network and transit access in the study area and advance the goals of the Township's and County's Non-Motorized and Transit plans.		
Environmental Justice	The study area does not include concentrations of minority or low-income populations.		
Property Acquisitions and Displacements	8 total takes (6 full and 2 partial takes); 3 displacements	6 (3 full and 2 partial takes); 3 displacements	53 (0 full and 53 partial takes); 3 displacements
Visual Impacts	Build Alternatives A and B provide greater opportunity for growth of the Genesys Health Park development and other mixed-use development around the proposed corridor. These alternatives will provide a non-motorized pathway connection for neighborhoods along with landscaping that will soften the visual appearance of pavement to create an attractive corridor. The Township has designated this area for health and mixed-use development cluster and has updated architectural standards and streetscape standards to enhance the quality of development in this area.		Build Alternative C will result in significant visual impacts to existing established neighborhoods along McWain Road due to ROW acquisition, tree removal, pavement expansion, and other changes resulting from this alignment.

6.21 Maintaining Traffic During Construction

6.21.1 Alternatives A and B

NB I-75 to NB M-54

This movement will always be open. When ramp allowing access for NB I-75 to SB M-54 through the northerly roundabout is constructed, it will be constructed with shoulder closures and temporary shifts.

SB I-75 to NB M-54

Option one is to close the ramp throughout construction. SB I-75 to NB M-54 traffic will be detoured to the Holly Road interchange (exit 108), north on Holly Road, back onto NB I-75 utilizing the new loop ramp to be completed in October 2017. Traffic will then exit NB I-75 to NB M-54 using the current NB I-75 to NB M-54 ramp, previously mentioned as to remain open throughout construction.

The second is to construct the proposed southerly roundabout part width. The south half of the roundabout would be constructed first while the ramp traffic would be maintained using the current configuration. During the construction of the northern half of the roundabout, traffic will be maintained on the previously constructed southern half of the roundabout. For this option, two-way traffic shall always be maintained at the SB M-54 to NB I-75 ramp terminal. This can be achieved two ways. The northerly and southerly roundabouts cannot be constructed at the same time, or, while the southerly roundabout is being constructed, the northerly roundabout will also be constructed part width. At the northern roundabout, two-way traffic will be maintained, using the existing pavement. The eastern half of the roundabout will be constructed, including the new connection to the northbound I-75 ramp. During this phase, ramp traffic would utilize the existing ramp. Following completion of the eastern half of the roundabout, traffic would then be routed through/over the eastern half of the roundabout. Temporary HMA would be placed in the center of the roundabout to accommodate the SB M-54 traffic. The western half of the roundabout would then be constructed. A temporary signal may be required for the SB M-54 to NB I-75 left turn movement.

SB M-54 to NB I-75

Option one is complete closure of the ramp. This would be done in conjunction with closure of the SB I-75 to NB M-54 closure. Traffic would be routed using local roads. NB I-75 traffic to Saginaw would use westbound Hill Road to NB I-475. Traffic needing to access NB I-75 between M-54 and the northern I-475 and I-75 interchange would use westbound Bristol Road to NB I-75.

The second involves part width roundabout construction as discussed above. The existing ramp would be utilized while the eastern half of the proposed roundabout is constructed. Once the eastern half of roundabout and proposed connections to the existing NB I-75 ramp is complete, the traffic would be shifted onto the roundabout as indicated previously. A temporary signal may be required for the SB M-54 to NB I-75 left turn movement.

SB M-54 to SB I-75

Option one is to construct the southern roundabout while maintaining the SB M-54 to SB I-75 traffic in its current configuration. Once the roundabout is complete, all traffic will be temporarily routed through the roundabout and connections while the roundabout bypass is reconstructed. This would be done in conjunction with the part width construction of the northern roundabout.

The second option is complete closure with detours. This is to only be considered if complete closure is utilized for the other ramp movements. This would require different detour options. One option is to use westbound Hill Road to southbound I-475. The second option is to use eastbound Grand Blanc Road or Hill Road to southbound Saginaw Street in downtown Grand Blanc to either southbound Holly Road, or to southbound I-75 at the Oakland/Genesee County border.

Cook Road Roundabout

Option one is to construct the roundabout in thirds. The northern and southern thirds of the roundabout will be constructed while maintaining traffic in its current configuration. Once the northern and southern thirds of the roundabout are constructed, traffic will then be shifted onto the roundabout using temporary HMA and middle third of the roundabout is constructed.

The other option is to detour Cook Road traffic using Holly Road, Baldwin Road, and Fenton Road.

Baldwin Road

The Baldwin Road and Dort Highway extension intersection will be constructed part width using lane shifts, temporary widening and traffic regulator control.

Additional Considerations

The Genesee County Road Commission will be reconstructing Hill Road between M-54 and I-475 in 2019. The existing roadway is in poor condition. All M-54/I-75 ramp construction would need to be complete prior to construction beginning on Hill Road.

If MDOT requires M-54 over I-75 bridge rehabilitation or reconstruction, the options that involve detours for the SB I-75 to NB M-54 and SB M-54 to SB I-75 movements may be the only viable options.

6.21.2 Alternative C

I-75 and M-54

Maintenance of traffic for each interchange movement will be achieved in the same manner as Alternatives 1 and 2.

Cook Road Roundabout

The proposed roundabout at the intersection of Cook Road and Proposed Extension/McWain Road will be constructed in the same manner as the Cook Road roundabout in Alternatives 1 and 2. Access for residents on McWain Road will be provided via Baldwin Road.

McWain Road

The proposed construction will be competed part width to maintain access for local residents and emergency traffic. McWain Road will be closed to through traffic throughout the construction duration. Cook Road, Fenton Road, and Baldwin Road will be utilized as the detour route.

Baldwin Road

The Baldwin Road and Dort Highway extension intersection will be constructed part width using lane shifts, temporary widening and traffic regulator control. Access for residents on McWain Road will be provided via Cook Road.

6.22 Environmental Permits

Proposed construction activities may involve the need for permits in several areas. Impacts on bodies of water such as lakes, drains and wetlands may require permits to meet the following regulations:

State of Michigan

- PA 451, Natural Resources and Environmental Protection and Floodplains Act, 1994, as amended
- PA 31, Water Resources Protection of Act 451
- Part 55, Air Pollution Control Act of Act 451
- Part 301, Inland Lakes and Streams of Act 451
- Part 303, Wetlands Protection of Act 451
- Drain Code, Public Act 40 of 1956
- Part 31, Floodplains of Act 451

Federal

- Sections 401 and 404 of the Federal Water Pollution Control Act of 1972

- Water Quality Act, Section 402 NPDES stormwater permit under the Clean Water Act of 1972 as amended
- Executive Order 11990

Part 31, 303 and 301 are administered by the MDEQ. A Part 31 Water Resources Protection Permit, which is reviewed and issued with the Part 301 and 303 applications, is needed to place fill material within any part of a floodplain with a drainage area of 2 square miles or greater. A Part 301 Inland Lakes and Stream Permit is required for any work below the ordinary high water mark of any inland lake, stream or drain including the placement of a permanent or temporary crossing, culvert or bridge, haul road, or construction access pad. A Part 303 Wetland Protection permit is required for any work within regulated wetlands.

The Drain Commissioner from each county has jurisdiction over established drains in the county in accordance with the Drain Code. Intercounty drains are under the jurisdiction of the Intercounty Drainage Board. Since 2014, the permit requirements are coordinated between the MDEQ and the Drain Commissioner under a Memorandum of Understanding. Projects entirely comprised of activities covered in the County Drains General Permit (GP) may be applied for using the County Drains GP permit application. If a project includes activity that does not fit the GP, then the entire project must be applied for through the regular Joint Permit Application (JPA) process. Drain activities that typically require a JPA application include, but are not limited to, deepening, widening, straightening, extending, creating, enclosing, or adding branches to a drain. Drain Commissioners may use any of the DEQ GP or Minor Project categories using the JPA if all of the activities for the project fit category criteria. The General Permit Category for County Drains includes:

- Clear Span Bridges
- Short Culverts
- Culvert End Sections, Headwalls and Wingwalls
- Riprap
- Long Culverts
- Drain Realignments
- Installation of stream channel “natural channel” restoration structures

If the activities do not meet a GP or Minor Project category, the permit application will be public noticed JPA permit.

Section 401 requires certification from the state's water quality agency (MDEQ) to ensure that the discharge of dredged or fill material complies with the provisions of the Federal Water Pollution Control Act. Water Quality Act Section 402 requires a National Pollution Discharge Elimination System Storm Water discharge permit for construction projects which involve earth disturbance of five acres or more. Permit application requirements include the name of receiving water, identification of soil erosion controls during construction, and identification of measures to control pollutants in storm water discharges that occur after construction has been completed. The intent of these requirements is to reduce impacts on water quality during and after construction of the project.

Executive Order 11990 states that when federal funds are used on a project, impacts on any wetland (regardless of size) will require that no "Prudent or Feasible Alternative" exists that would eliminate or reduce impacts on that wetland.

Final mitigation measures proposed in areas requiring the above permits will be developed in consultation with the appropriate resource agencies, and will be included in the permit application.

6.23 Construction Impacts and Measures to Minimize Impacts During Construction

The goal of project mitigation is to preserve, to the greatest extent possible, existing neighborhoods, land use, and natural resources, while improving transportation. Although some adverse impacts are unavoidable, the project development, design, environmental and construction processes, takes precautions to protect as many social and environmental systems as possible. Specific mitigation items being considered at this time can be found in the Project Mitigation Summary located in section 6.24. A Final Mitigation Summary will be prepared and included in the project Finding of No Significant Impact (FONSI). The Mitigation Summary may be modified during the final design, right-of-way or construction phase of this project.

6.24 Project Mitigation Summary for the Preferred Alternative (Alternative A)

6.24.1 Noise

The Preferred Alternative is expected to impact 4 dwelling units. Mitigation measures being considered include the construction of landscape buffers within or adjacent to the right-of-way. A public meeting was held in June 2016 to determine acceptable community noise mitigation options. Community comments are currently being received.

6.24.2 Social Impact

The Build Alternatives include the Alternative 3 McWain Road Alignment. Based on comments in opposition to this alternative received at and subsequent to the June 2016 Public Information Meeting, the Road Commission has decided to not pursue this alignment. The Preferred Alternative will not have the magnitude of negative social impacts as Alternative 3 with the exception of the impacts during construction. During the final design and construction, detailed maintaining traffic plans and construction phasing will be required to mitigate and minimize any transportation impacts.

6.24.3 Right-of-Way Acquisition and Relocation

Compliance with State and Federal Laws: Acquisition and relocation assistance and advisory services will be provided by the Genesee County Road Commission in accordance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; Act 149, Michigan P.A. 1911, as amended; Act 87, Michigan P.A. 1980, as amended; Act 367, Michigan P.A. 2006, as amended; Act 439, Michigan P.A. 2006, as amended; and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. The MDOT will inform individuals, businesses and non-profit organizations of the impact, if any, of the project on their property. Every effort will be made through relocation assistance to lessen the impact when it occurs.

Residential: The GCRC is required by statute to determine the availability of comparable, decent, safe and sanitary housing for eligible displaced individuals. The GCRC has specific programs to implement the statutory and constitutional requirements of property acquisition and relocation of eligible displacees. Appropriate measures will be taken to ensure that all eligible displaced individuals are advised of the rights, benefits, and courses of action available to them.

Purchasing Property: The GCRC will pay just compensation for fee purchase or easement use of property required for transportation purposes. "Just compensation" as defined by the courts is the payment of "fair market value" for the property rights acquired plus allowable damages to any remaining property. "Fair market value" is defined as the highest price estimated, in terms of money, the property would bring if offered for sale on the open market by a willing seller, with a reasonable time allowed to find a purchaser, buying with the knowledge of all the uses to which it is adapted and for which it is capable of being used.

Relocation Information: A booklet entitled "Your Rights and Benefits" detailing the relocation assistance program can be obtained from the Michigan Department of Transportation, Development Services Division, P.O. Box 30050, Lansing, Michigan 48909 or phone (517) 373-2200.

Property Acquisition Information: A booklet entitled "Public Roads & Private Property" detailing the purchase of private property can be obtained from the Michigan Department of Transportation, Development Services Division, Real Estate Section, P.O. Box 30050, Lansing, Michigan 48909 or phone (517) 373-2200.

Conceptual Stage Relocation Plan: The Conceptual Stage Relocation Plan is provided in Appendix N of this document.

6.24.4 Air Quality

Construction contractors will be required to comply with all relevant federal, state and local laws governing air pollution. Construction crews will be responsible for adequate dust control measures to minimize temporary air quality impacts during construction.

6.24.5 Water Quality

Accelerated sedimentation caused by the construction should be controlled before it leaves the project ROW and enters Seaver Drain or any of the on-site wetlands. This may be accomplished by placement of temporary or permanent erosion and sedimentation control measures and stormwater best management practices. These measures will be specified during the development of final plans and specifications. Contractors will be required to follow the procedures detailed in the plans as well follow the conditions of the permits.

6.24.6 Endangered and Threatened Species

The Genesee County Road Commission will consult as may be necessary during the project design and construction with the MDNR and USFWS to implement species conservation measures as may be required and include necessary provisions for protection and conservation of the potential threatened and endangered species as detailed in Section 6.17 of the EA. The protection and conservation measures may include implementation of species dependent seasonal tree removal and clearing restrictions and migratory bird habitat disturbance mitigation measures. In addition, reasonable attempts will be made to leave as much ground vegetation and trees as possible within the ROW to provide habitat for potentially affected species.

6.24.7 Wetlands

The preferred mitigation strategy will be for the applicant to mitigate impacts through wetland creation of the type impacted. Depending on the final impacts, compensatory mitigation requirements will be conditions of the permits issued for the project during development of final plans.

6.24.8 Visual Impacts

During construction, reasonable attempts will be made to maintain as much vegetation as possible within the proposed right-of-way. Vegetation outside the ROW will remain. Context sensitive design principles will be used for the final design to lessen the visual impact of the project.

6.24.9 Construction Impacts

Since the project will impact more than 5 acres, a NPDES Notice of Coverage permit must be submitted to MDEQ prior to construction. A certified stormwater operator will conduct weekly inspections and also inspect the site within 24 hours of a rain event. All record keeping requirements will be enforced. All excavation and filling of soils will be performed pursuant to the plans and permits issued for construction and as approved by the regulatory agencies.

6.24.10 Conformance with Plans, Policies and Controls

A transportation development project plays an important role in the local and regional economy. Often times, a project, such as this, has influenced the type and location of specific land uses, the transportation network and the general direction of the community growth plans. When evaluating an actions conformance with plans and policies, there are usually two levels of planning involved. The first level addresses the

policy plans, which are goals and objectives for the area. The second addresses specific physical plans that direct development of the physical infrastructure. An analysis of the local and regional development plans indicate that the project conforms to local and regional transportation plans and meets their goals and objectives.

6.24.11 Conformance with Laws and Administrative Rules

Various federal, state, regional and local agencies were contacted to solicit their comments on the proposed project as it relates to their specific area of expertise or regulatory jurisdiction including permitting and mitigation requirements. Based on this coordination, inconsistency with known federal, state and local laws and administrative rules is not expected. All phases of the proposed action would adhere to appropriate regulations. A summary of approvals and permits required to implement the Preferred Alternative is included in Table 6-6. See Appendix A for a listing of the agencies that commented on the project during the preparation of this document.

6.24.12 Soil Erosion and Sedimentation Control

The Contractor will be required to deploy Construction Stormwater Best Management Practices as needed such as sediment traps, temporary sedimentation ponds and temporary stabilization during construction. Permanent stabilization will be established as soon as possible. All excavated soils will be deposited in non-regulated upland areas or disposed off-site in an approved facility. All staging and material storage will be located outside regulated lands and waters and the contractor will be required to utilize construction stormwater best management practices for all operations. The contractor will develop a site specific SESC plan prior to the start of work. A certified stormwater operator will conduct weekly inspections and inspect the site within 24-hours of a rain event. All record keeping requirements will apply.

6.24.13 Maintenance of Traffic and MDOT Coordination

The objective of the Maintenance of Traffic (MOT) Plan will be to minimize traffic disruption to the extent possible and minimize or eliminate any adverse safety impacts. As most of the Preferred Alternative will be built on new alignment, this will minimize disruption to most traffic in the area. Several MOT concepts for controlling traffic were identified. One is closure of the roadway and managing traffic via posted detours. The other concept is part-width construction, which involves providing a lane for moving traffic and constructing the new roadway on the other half of the road.

The priority in construction of the Preferred Alternative would be to build the three-lane section between the I-75 ramps and Baldwin Road. During this time, signs would be erected on the I-75 ramps, Cook Road, Pollock Road and Baldwin Road informing motorists of the construction. Type III barriers would be erected at the intersections to prevent motorists from entering the new highway. After placement of the base course, work will begin on the two roundabouts on the I-75 ramps. At that time, a decision will be made concerning the closure of selected ramps such as the I-75 southbound ramp to northbound Dort Highway and the I-75 northbound ramp from Dort Highway to I-75. With this scenario, the I-75 northbound ramp to northbound Dort Highway would remain open along with the southbound ramp to southbound I-75. Due to the very limited space at the interchange, it is not envisioned that both directions of travel would remain open while building the roundabouts.

Traffic volumes on Cook and Pollock roads are low. Construction of the tie into the new Dort Highway would be done with lane closures on these facilities. Closure of either road is not envisioned in this project. The last connection on the project is to Baldwin Road. It appears that from Dort Highway to Holly Road that Baldwin Road will be reconstructed as a five-lane section. This work will most likely be conducted with both lanes open to traffic and the new lanes being constructed at the same time. MDOT will establish official detour routes over the M-54 state trunkline system. It is anticipated that multiple construction seasons will be needed to complete the work.

The GCRC will maintain public awareness throughout the project by providing general information, addressing public concerns, and providing specific information such as the location and duration of detours, lane closures, alternate routes, upcoming activities and anticipated construction deadlines. The will be done through the GCRC web site, a project hotline and/or portable messaging signs during construction.

The GCRC will be required to obtain Right-of-Way Construction permits to connections to the I-75 Northbound and Southbound ramps.

Table 6-6. Agency Approval/Permits Required

Agency	Approvals / Permits Required
Federal Highway Administration	Compliance with NEPA, Finding of No Significant Impact.
U.S Environmental Protection Agency	Statement of no affect.
U.S Fish and Wildlife Service	Statement of no affect.
Federal Emergency Management Agency	Statement of no affect.
Michigan Department of Natural Resources	Statement of no affect.
Michigan Department of Environmental Quality	Statement of no affect, General Permit pursuant to Part 303, 301 and 31.
Michigan State Historic Preservation Office	Statement of no affect.
Genesee County Drain Commissioner	Statement of no affect, Permit per PA 98 Drain Code.
Michigan Department of Transportation	Right-of-Way Construction Permit

6.24.14 Means to Mitigate Adverse Environmental Impacts

Avoidance and minimization of permanent adverse impacts on the environment will be a goal of this project as it moves forward during the design and permitting phases. The various impacts of the alternatives and the means to mitigate them to the greatest extent possible are summarized in Table 6-7.

3039 Table 6-7. Environmental Mitigation Summary – Preferred Alternative

Environmental Factor	Permanent Negative Impact?	Mitigation Requirement
Noise	Yes	Pending Public Comment.
Compatible Land Use	No	None Required.
Social Impacts	No	Develop detailed maintenance of traffic and construction phasing plans.
Environmental Justice	No	None Required.
Air Quality	No	Use proper dust control techniques during construction.
Water Quality	No	Comply with Genesee County Erosion and Sediment Control program and MDEQ NPDES Permit.
Section 4(f)	No	None Required.
Cultural Resources	No	None Required.
Endangered & Threatened Species	No	Tree and habitat removal restrictions from April 1 to September 30.
Wetlands/Streams	No	Compensatory Wetland Mitigation.
Floodplains	No	Compensatory Floodplain Compensation.
Coastal Zone Management	No	None Required.
Coastal Barriers	No	None Required.
Wild and Scenic Rivers	No	None Required.
Farmlands	No	None Required.
Right-of-Way Takes	Yes	The GCRC will coordinate to find suitable housing for residents displaced by the Preferred Alternative.
Visual	Yes	Apply context sensitive design techniques for roadway.
Construction Impacts	No	Apply appropriate erosion/sediment control measures, comply with MDOT's and Genesee County Erosion Control and Sediment Control program. A Certified Stormwater Operator will conduct weekly inspections.
Cumulative Impacts	No	None Required.

3040

7.0 COORDINATION AND CONSULTATION

7.1 PUBLIC INVOLVEMENT

The public involvement process has been and will be inclusive of all residents and population groups in the study area and will not exclude any persons based on income, race, color, religion, national origin, age or disability.

The public involvement process has begun at the early stages of the project scoping. The Genesee County Road Commission and Planning Department have been exchanging information and dialogue with the project stakeholders for several years. The project has generated strong support as well as opposition to the project. The road commission has established a project website at www.gcrc.org, and encouraged the exchange of information and discourse, both in support and in opposition, since the Public Information Workshop held in late June 2016. Opposition to the project has been voiced, primarily by those residents along McWain Road that would be directly affected by Build Alternative C. Based on the amount of opposition and impacts noted in the Environmental Assessment (EA), it was decided subsequent to the Public Workshop, to no longer pursue this option. A log of the public comment and response is provided in Appendix L.

Upon approval of this EA by the Federal Highway Administration and the Michigan Department of Transportation, the document will be made available for public review and comment for a minimum of 30 days. During this 30-day period, a public hearing will be advertised and held. Written comments from the public will be considered and incorporated in to the Final EA where applicable.

7.2 AGENCY COORDINATION

Letters and project information, including maps and aerial photographs of the project area, were sent to relevant local, state, and federal agencies in October of 2015. The purpose of the coordination efforts was to obtain early input from various resource agencies regarding the development of the EA, associated impacts, and required mitigation. Copies of the letters received from governmental agencies during the early scoping of the project are included at the end of this section.

The following agencies were contacted as part of the early agency coordination process:

- State Historic Preservation Office, Michigan Historical Center
- USDA - Wildlife Services
- MDEQ, Land and Water Management Division, Trans. Review Unit
- Regulatory Functions Branch, U.S. Army - Corps of Eng. Detroit District, Construction - Operations Division
- Federal Emergency Management Agency
- Natural Resources Conservation Service
- U.S. Fish and Wildlife - East Lansing Office
- NEPA Implementation Section, Office of Science, Ecosystems, and Communities, U.S. EPA Region 5
- Michigan Department of Natural Resources, Resource Management Deputy
- Michigan Department of Natural Resources, Wildlife Division
- U.S. Environmental Protection Agency, Permitting
- U.S. Environmental Protection Agency, Region 5
- Genesee County Sheriff Department
- Grand Blanc Charter Township Fire Department
- Grand Blanc Public Schools
- U.S Department of Interior, Bureau of Indian Affairs, Michigan Agency
- Little Traverse Bay Bands of Odawa Indians
- Little River Bands of Ottawa Indians
- Bay Mills Indian Community
- Match-e-be-nash-she-wish Band of Pottawatomi Indians
- Pokagon Band of Potawatomi Indians
- Saginaw Chippewa Indian Tribe of Michigan
- Sault Sainte Marie Tribe of Chippewa Indians of Michigan
- Lac Vieux Desert Band of Lake Superior Chippewa Indians
- Hannahville Indian Community
- Grand Traverse Band of Ottawa and Chippewa Indians
- Keweenaw Bay Indian Community
- Nottawaseppi Huron Band of the Potawatomi

8.0 PROJECT COSTS

Dort Highway Extension

Preliminary Project Cost Estimates

May 4, 2017

Item	Estimated Cost		
	Alternate A	Alternate B	Alternate C
Professional Services			
Environmental Assessment	$410,000	$410,000	$410,000
Early Preliminary Engineering	$175,000	$175,000	$175,000
Preliminary Engineering	$650,000	$685,000	$760,000
Right of Way Acquisition	$110,000	$125,000	$145,000
Construction Engineering	$1,605,000	$1,587,000	$1,717,500
Subtotal Professional Services	$2,950,000	$2,982,000	$3,207,500
Construction Costs			
Right of Way	$900,000	$825,000	$1,575,000
Project Construction	$10,500,000	$10,300,000	$11,400,000
Wetland Mitigation	$200,000	$280,000	$50,000
Subtotal Construction	$11,600,000	$11,405,000	$13,025,000
20% Construction Contingency	$2,320,000	$2,281,000	$2,605,000
Project Total	**$16,870,000**	**$16,668,000**	**$18,837,500**

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APPENDIX A

HISTORICAL, ARCHAEOLOGICAL, AND SECTION 106 COORDINATION LETTERS

DEPARTMENT OF THE ARMY
DETROIT DISTRICT, CORPS OF ENGINEERS
477 MICHIGAN AVENUE, ROOM 603
DETROIT MI 48226-2550

REPLY TO
ATTENTION OF:

July 29, 2015

Engineering & Technical Services
Regulatory Office
File No. LRE-2015-00642-225-A15

Jason Smith
Wade Trim Associates, Inc.
500 Griswold Avenue
Suite 2500
Detroit, Michigan 48226

Dear Mr. Smith:

This is in response to your July 27, 2015 letter regarding the Dort Highway Extension Project that is being considered by the Genesee County Road Commission. The project will entail extending the Dort Highway from its current terminus at I-75 further south to Baldwin Road in Genesee County, Michigan.

In 1984, a portion of the Corps' regulatory responsibilities was assumed by the Michigan Department of Environmental Quality (MDEQ). This project site is within the assumed area. Unless otherwise notified, a separate authorization from the Corps is not required; however, you may need to obtain a permit from the MDEQ. Therefore, we recommend that you contact Chris Clampitt with the MDEQ at clampittc@michigan.gov or at 517-243-6956 for a determination of State permit requirements.

Should you have any questions, please contact John Bochenek at the above address, at john.l.bochenek@usace.army.mil, or at 313-226-6755 . In all communications, please refer to File Number LRE-2015-00642-225-A15.

We are interested in your thoughts and opinions concerning your experience with the Detroit District, Corps of Engineers Regulatory Program. If you are interested in letting us know how we are doing, you can complete an electronic Customer Service Survey from our web site athttp://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0. Alternatively, you may contact us and request a paper copy of the survey that you may complete and return to us by mail or fax. Thank you for taking the time to complete the survey, we appreciate your feedback.

Sincerely,

Donald T. Reinke
Chief, Compliance and Enforcement Branch
Regulatory Office

DEPARTMENT OF THE ARMY
DETROIT DISTRICT, CORPS OF ENGINEERS
477 MICHIGAN AVE.
DETROIT, MICHIGAN 48226-2550

October 16, 2015

Jason Smith, AICP
500 Griswold, Suite 2500
Detroit, MI 48226

Dear Mr. Smith:

This is in response to your letter of July 27, 2015, regarding National Environmental Policy Act compliance review for the proposed extension of Dort Highway (M-54) in Genesee County, Michigan. Our Regulatory Office has responded separately to your request (Enclosure 1). The following comments are in accordance with our responsibilities under our civil works and floodplain management programs.

Our civil works program does not include any current plans to develop waterways in the vicinity of your project; nor do we have any current or proposed flood management studies for the area described in your letter.

Review of the applicable Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (Enclosure 2) indicates that the project area includes Federally mapped floodplains. Effects on floodplains could occur with side cast material from project excavation, roadbed fill, and other materials or structures, if located in the floodplain. We recommend that you also coordinate with local officials and with the Michigan Department of Environmental Quality regarding the applicability of a floodplain permit prior to construction, as their floodplain designations may include areas not depicted in the FEMA maps. This coordination would help ensure compliance with local and state floodplain management regulations and acts. If you obtain information that any part of your project would impact the floodplain, you should consider other sites. This would be consistent with current Federal policy to formulate projects that, to the extent possible, avoid or minimize adverse impacts associated with use of the floodplain.

We appreciate the opportunity to comment on the proposed extension of Dort Highway (M-54) in Genesee County, Michigan. Any questions may be directed to Mr. Paul Allerding of my staff at 313-226-7590 or me at 313-226-2476.

Sincerely,

Original signed

Charles A. Uhlarik, Chief
Environmental Analysis Branch

Enclosures (2)

Copies furnished (electronic):

Jason Smith, Wade Trim Associates, Inc. Detroit
Mary Weidel, Corps Floodplain Management Services, Detroit

DEPARTMENT OF THE ARMY
DETROIT DISTRICT, CORPS OF ENGINEERS
477 MICHIGAN AVENUE, ROOM 603
DETROIT MI 48226-2550

July 29, 2015

REPLY TO
ATTENTION OF:
Engineering & Technical Services
Regulatory Office
File No. LRE-2015-00642-225-A15

Jason Smith
Wade Trim Associates, Inc.
500 Griswold Avenue
Suite 2500
Detroit, Michigan 48226

Dear Mr. Smith:

This is in response to your July 27, 2015 letter regarding the Dort Highway Extension Project that is being considered by the Genesee County Road Commission. The project will entail extending the Dort Highway from its current terminus at I-75 further south to Baldwin Road in Genesee County, Michigan.

In 1984, a portion of the Corps' regulatory responsibilities was assumed by the Michigan Department of Environmental Quality (MDEQ). This project site is within the assumed area. Unless otherwise notified, a separate authorization from the Corps is not required; however, you may need to obtain a permit from the MDEQ. Therefore, we recommend that you contact Chris Clampitt with the MDEQ at clampittc@michigan.gov or at 517-243-6956 for a determination of State permit requirements.

Should you have any questions, please contact John Bochenek at the above address, at john.l.bochenek@usace.army.mil, or at 313-226-6755 . In all communications, please refer to File Number LRE-2015-00642-225-A15.

We are interested in your thoughts and opinions concerning your experience with the Detroit District, Corps of Engineers Regulatory Program. If you are interested in letting us know how we are doing, you can complete an electronic Customer Service Survey from our web site athttp://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0. Alternatively, you may contact us and request a paper copy of the survey that you may complete and return to us by mail or fax. Thank you for taking the time to complete the survey, we appreciate your feedback.

Sincerely,

Donald T. Reinke
Chief, Compliance and Enforcement Branch
Regulatory Office

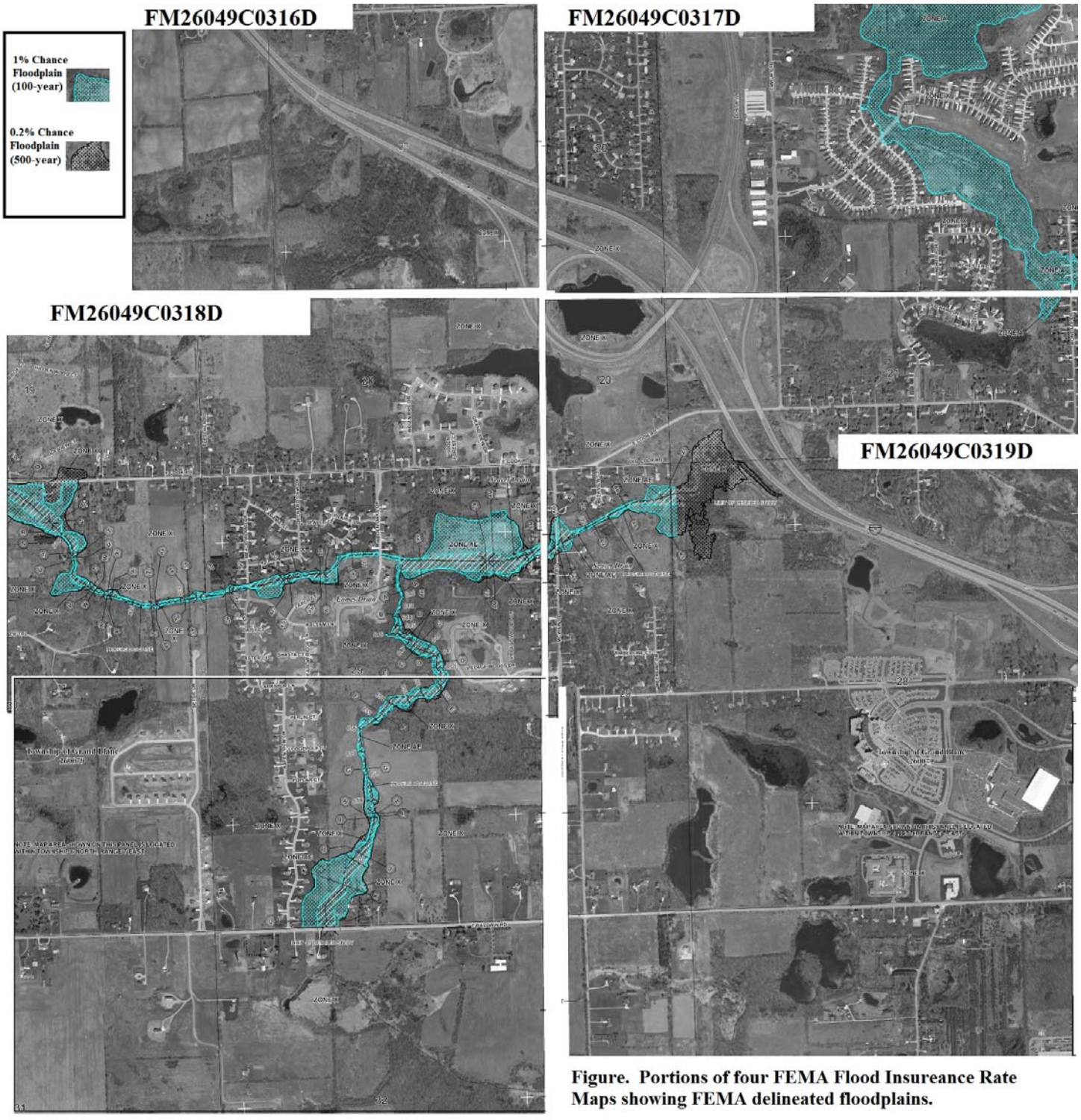
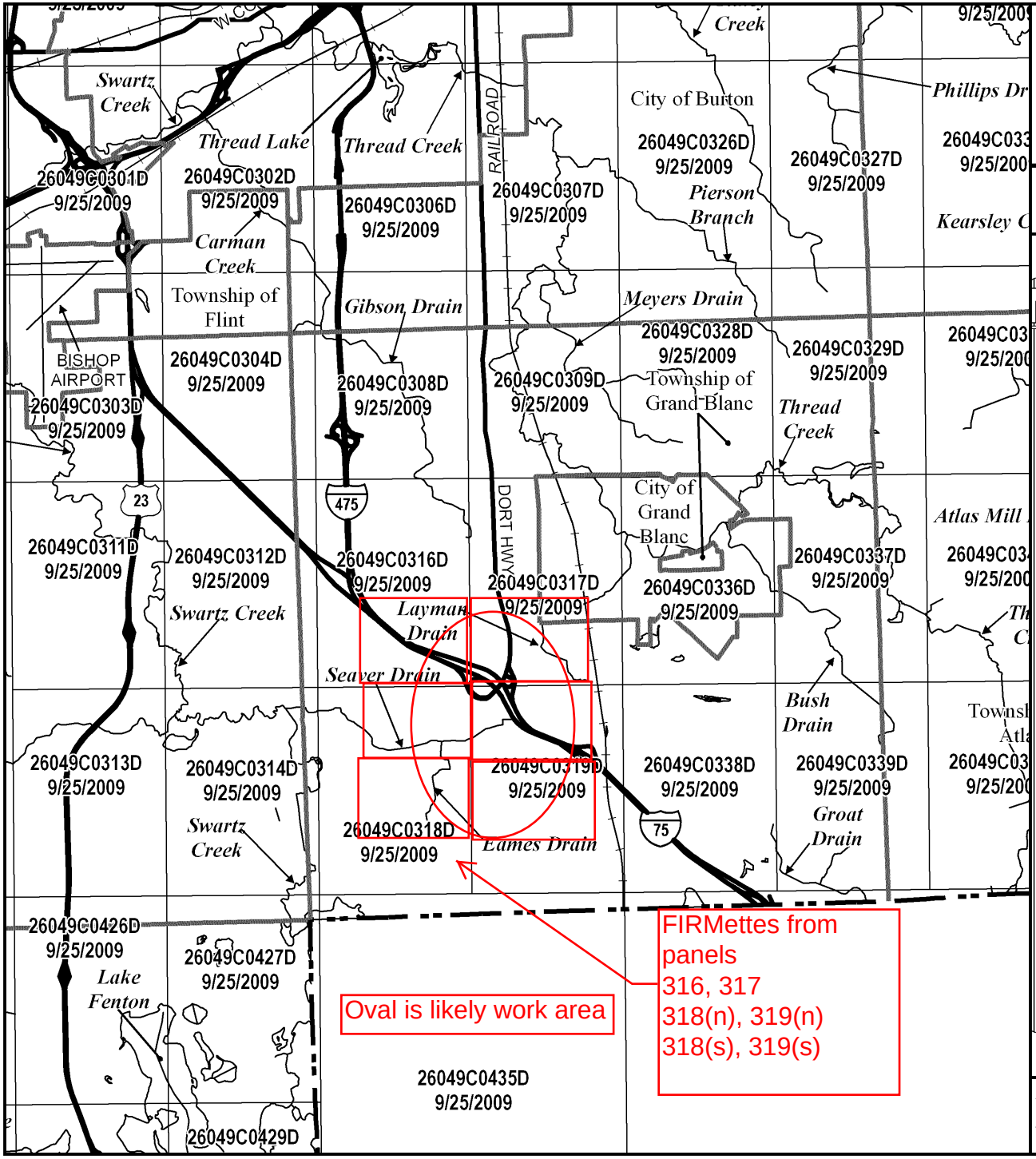


Figure. Portions of four FEMA Flood Insureance Rate Maps showing FEMA delineated floodplains.



NFIP NATIONAL FLOOD INSURANCE PROGRAM

MAP INDEX

FIRM

FLOOD INSURANCE RATE MAP

GENESEE COUNTY, MICHIGAN

(ALL JURISDICTIONS)

(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

PANELS PRINTED: 17, 19, 25, 28, 30, 35, 36, 37, 38, 39, 42, 45, 61, 62, 63, 64, 75, 100, 125, 150, 151, 152, 153, 154, 156, 157, 158, 159, 161, 162, 163, 164, 166, 167, 168, 169, 176, 177, 178, 182, 183, 184, 186, 187, 188, 189, 191, 192, 193, 194, 201, 202, 203, 204, 210, 211, 212, 213, 214, 216, 217, 218, 219, 250, 257, 258, 259, 266, 267, 268, 269, 277, 278, 279, 281, 282, 283, 284, 287, 290, 295, 301, 302, 303, 304, 306, 307, 308, 309, 311, 312, 313, 314, 316, 317, 318, 319, 326, 327, 328, 329, 331, 332, 333, 334, 336, 337, 338, 339, 341, 342, 343, 344, 365, 375, 382, 383, 384, 392, 395, 401, 402, 403, 404, 406, 407, 408, 409, 411, 412, 415, 416, 417, 426, 427, 428, 429, 435, 436, 437, 445, 475

MAP NUMBER
26049CIND0A

EFFECTIVE DATE
September 25, 2009

Federal Emergency Management Agency

MAP SCALE 1" = 500'

0 500 1000 FEET

0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0316D

FIRM

FLOOD INSURANCE RATE MAP

GENESEE COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 316 OF 475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRAND BLANC, TOWNSHIP OF	260079	0316	D

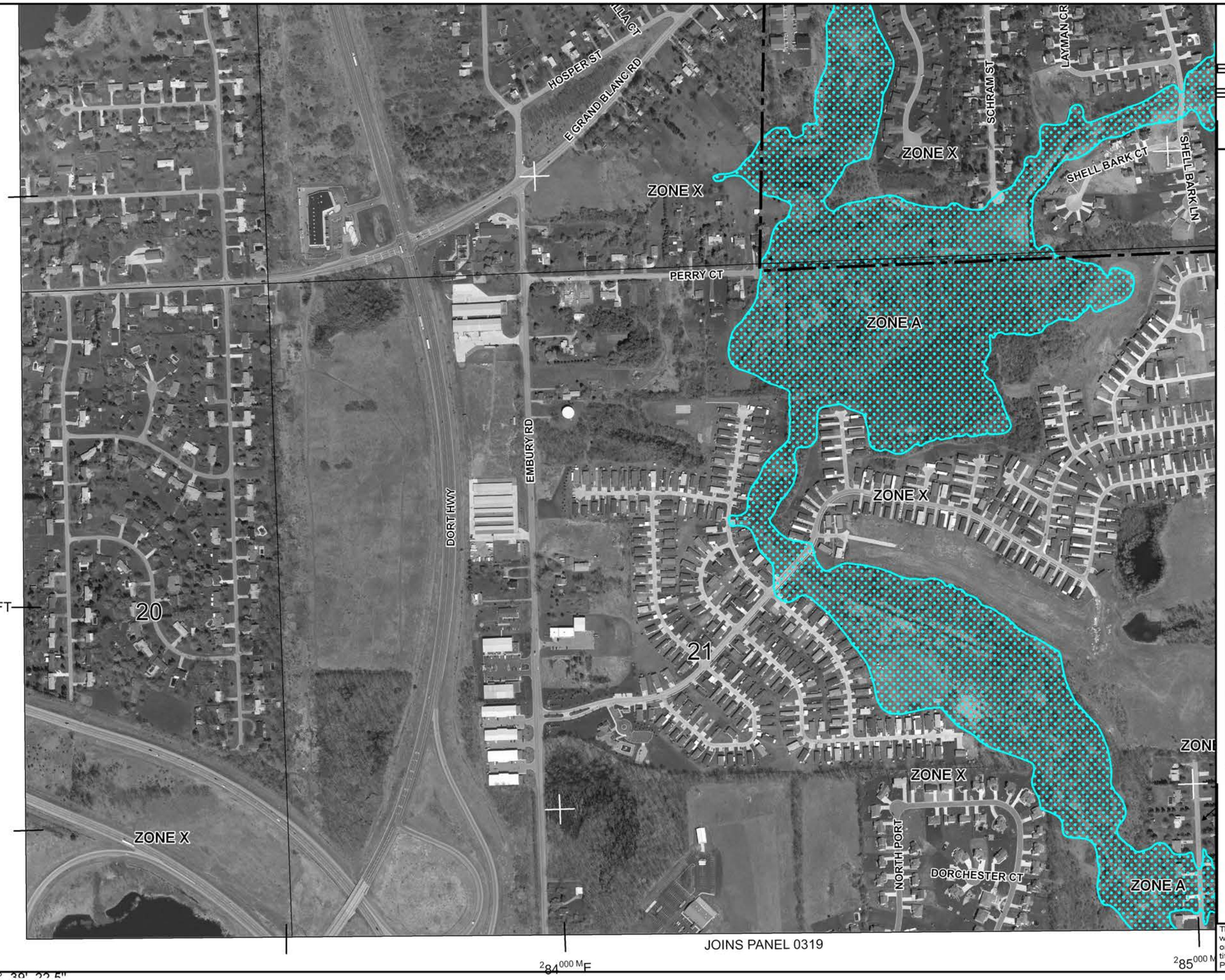
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26049C0316D

EFFECTIVE DATE
September 25, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 500'

0 500 1000 FEET

0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0317D

FIRM

FLOOD INSURANCE RATE MAP

GENESEE COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 317 OF 475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRAND BLANC, CITY OF	260255	0317	D
GRAND BLANC, TOWNSHIP OF	260079	0317	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26049C0317D

EFFECTIVE DATE
September 25, 2009

Federal Emergency Management Agency

JOINS PANEL 0316

13310000 FT

83° 39' 2

MAP SCALE 1" = 500'

0 500 1000 FEET

0 150 300 METERS

ZONE X

ZONE AE

FOREST GLEN DR

HIDDEN WOOD CT

RIDGE CT

19

20

FLETCHER RD

INDIAN PIPE DR

HIDDEN FOREST CT

GRAND VIEW DR

E COOK RD

RIDGE VIEW CT

ORCHARD VIEW DR

Seaver Drain

LARAMIE ST

SEAVER CT

PRAIRIE VW

HIDDEN OAKS DR

MEADOWLAND DR

Eames Drain

LARCH CT

BALSAM LN

DAISY CT

ASTER CT

SHASTA CT

MEADOW RIDGE LN

LARKSPUR LN

VILLAGE WOODS DR

VILLAGE WOODS CT

BETSIE DR

PROFILE BASE LINE

29

30

NFIP

PANEL 0318D

FIRM

FLOOD INSURANCE RATE MAP

GENESEE COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 318 OF 475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRAND BLANC, TOWNSHIP OF	260079	0318	D

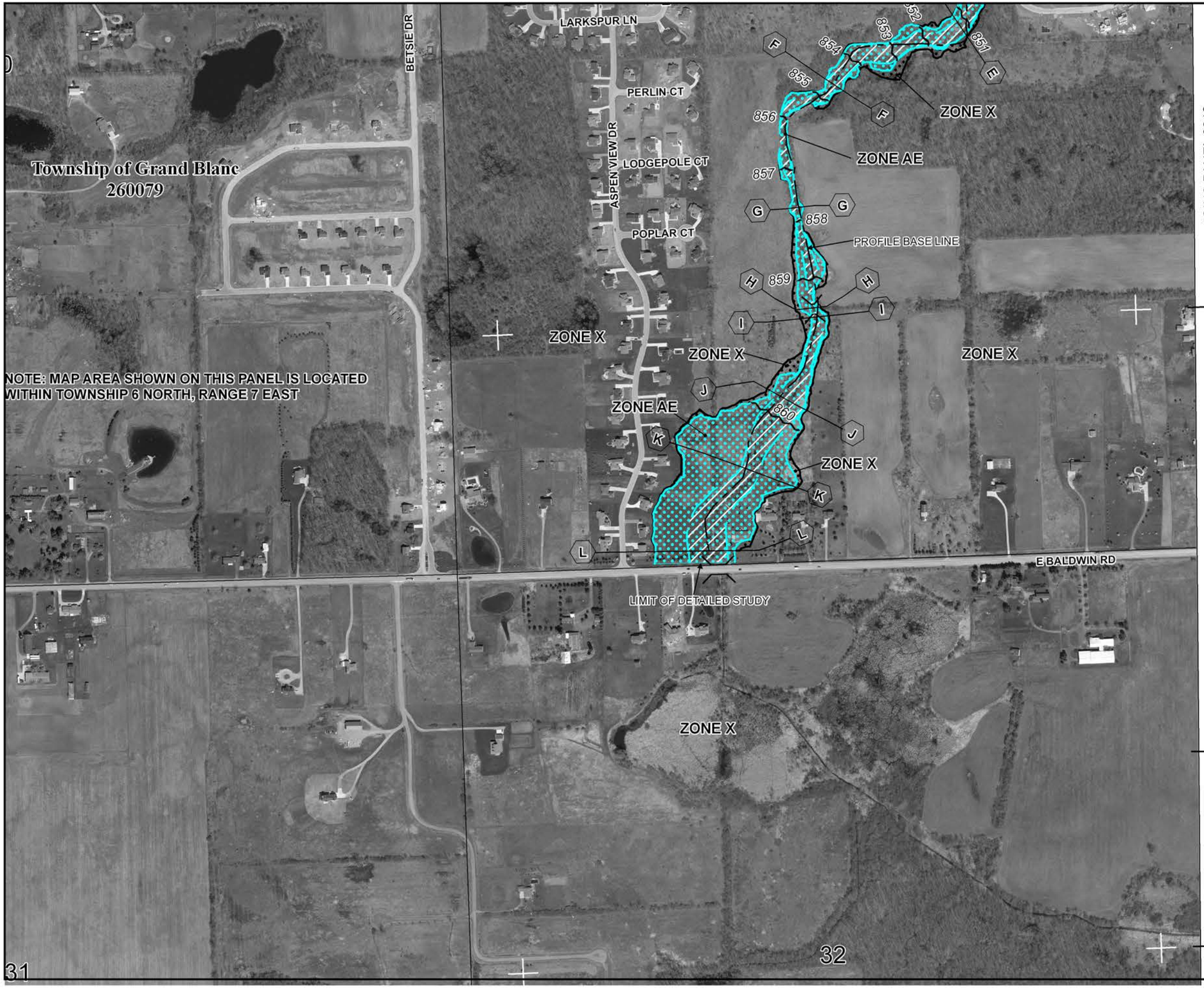
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26049C0318D

EFFECTIVE DATE
September 25, 2009

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM



JOINS PANEL 0319

MAP SCALE 1" = 500'

0 500 1000 FEET

0 150 300 METERS

NFIP

PANEL 0318D

FIRM

FLOOD INSURANCE RATE MAP

GENESEE COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 318 OF 475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRAND BLANC, TOWNSHIP OF	260079	0318	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26049C0318D

EFFECTIVE DATE
September 25, 2009

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

° 39' 22.5"

13315000 FT

JOINS PANEL 0317

MAP SCALE 1 " = 500 '

0 500 1000 FEET

0 150 300 METERS

ZONE X

20

21

ZONE A

OLD HARBOR

NORTH PORT

RONDALE DR

E COOK RD

ZONE X

OLD COOK RD

AS

ZONE X

ZONE AE

CREEKVIEW CT

AR

AO

AP

AO

842

AR

LIMIT OF DETAILED STUDY

ZONE X

AS

AO

AP

Seaver Drain

ZONE AE

PROFILE BASE LINE

FT

ZONE X

ZONE X

MCWAIN RD

TIMBERLINE CT

TIMBERLINE DR

75

28

29

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0319D

FIRM

FLOOD INSURANCE RATE MAP

GENESEE COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 319 OF 475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRAND BLANC, TOWNSHIP OF	260079	0319	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26049C0319D

EFFECTIVE DATE
September 25, 2009

Federal Emergency Management Agency

MAP SCALE 1" = 500'

0 500 1000 FEET

0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0319D

FIRM

FLOOD INSURANCE RATE MAP

GENESEE COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 319 OF 475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRAND BLANC, TOWNSHIP OF	260079	0319	D

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MAP NUMBER
26049C0319D

EFFECTIVE DATE
September 25, 2009

Federal Emergency Management Agency

United States Department of the Interior

FISH AND WILDLIFE SERVICE
East Lansing Ecological Services Field Office
2651 COOLIDGE ROAD SUITE 101
EAST LANSING, MI 48823
PHONE: (517)351-2555 FAX: (517)351-1443
URL: www.fws.gov/midwest/endangered/section7/s7process/step1.html

Consultation Code: 03E16000-2017-SLI-0090 December 07, 2016
Event Code: 03E16000-2017-E-00123
Project Name: Dort Highway Extension

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Fish and Wildlife Service if they determine their project may affect listed species or critical habitat.

There are several important steps in evaluating the effects of a project on listed species. Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions to help you determine if your project may affect listed species and lead you through the section 7 consultation process.

Under 50 CFR 402.12(e) (the regulations that implement section 7 of the Endangered Species Act), the accuracy of this species list should be verified after 90 days. You may verify the list by visiting the ECOS-IPaC website (http://ecos.fws.gov/ipac/) at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

For all **wind energy projects** and **projects that include installing towers that use guy wires or are over 200 feet in height**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project area or may be affected by your proposed project.

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see http://www.fws.gov/migratorybirds/RegulationsandPolicies.html.

Although no longer listed under the Endangered Species Act, bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act (16 U.S.C. 703 *et seq*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you avoid impacting eagles or determine if a permit may be necessary.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/BirdHazards.html.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit http://www.fws.gov/migratorybirds/AboutUS.html.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Dort Highway Extension

Official Species List

Provided by:

East Lansing Ecological Services Field Office
2651 COOLIDGE ROAD SUITE 101
EAST LANSING, MI 48823
(517) 351-2555
http://www.fws.gov/midwest/endangered/section7/s7process/step1.html

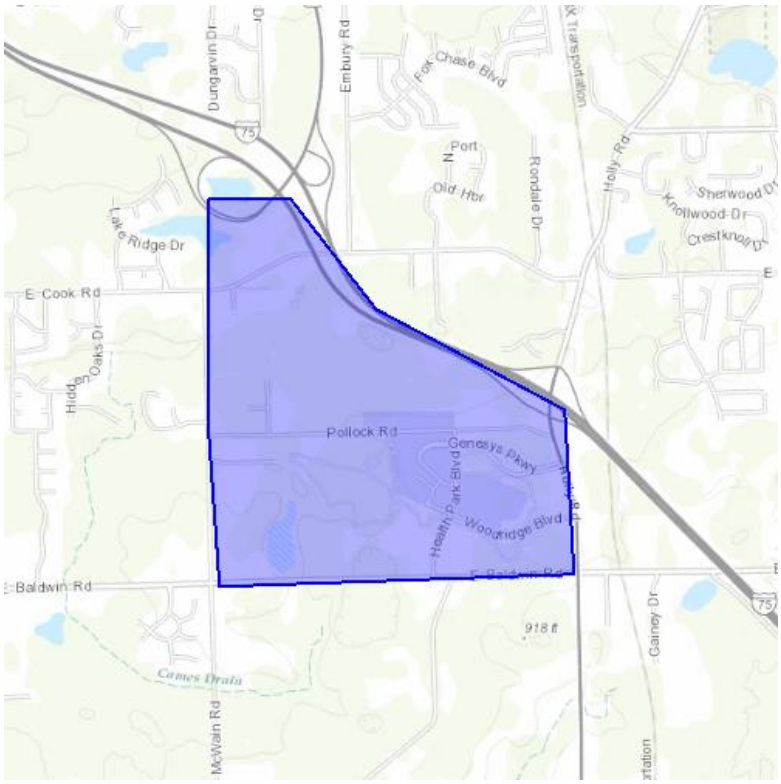
Consultation Code: 03E16000-2017-SLI-0090
Event Code: 03E16000-2017-E-00123

Project Type: TRANSPORTATION

Project Name: Dort Highway Extension
Project Description: Genesee County Road Commission Proposed Extension of Dort Highway

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-83.65008944878353 42.9053825768838, -83.64433708484285 42.89992025899444, -83.63152599544264 42.894986907957495, -83.63093891646713 42.886840925585915, -83.65487194270827 42.886219587933994, -83.65565815474838 42.89378966683692, -83.65565815474838 42.90542909560253, -83.65008944878353 42.9053825768838)))

Project Counties: Genesee, MI

Endangered Species Act Species List

There are a total of 4 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Flowering Plants	**Status**	**Has Critical Habitat**	**Condition(s)**
Eastern Prairie Fringed orchid *(Platanthera leucophaea)* Population: Wherever found	Threatened		
Mammals			
Indiana bat *(Myotis sodalis)* Population: Wherever found	Endangered		
Northern long-eared Bat *(Myotis septentrionalis)* Population: Wherever found	Threatened		
Reptiles			
eastern Massasauga *(Sistrurus catenatus)* Population: Wherever found	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Appendix A: FWS National Wildlife Refuges and Fish Hatcheries

There are no refuges or fish hatcheries within your project area.

Appendix B: FWS Migratory Birds

The protection of birds is regulated by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). The MBTA has no otherwise lawful activities. For more information regarding these Acts see:
http://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php
http://www.fws.gov/birds/policies-and-regulations/laws-legislations/bald-and-golden-eagle-protection-act.php

All project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. To meet these conservation obligations, proponents should identify potential or existing project-related impacts to migratory birds and their habitat and develop and implement conservation measures that avoid, minimize, or compensate for these impacts. The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

For information about Birds of Conservation Concern, go to:
http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

For information about conservation measures that help avoid or minimize impacts to birds, please visit:
http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php

To search and view summaries of year-round bird occurrence data within your project area, go to the Avian Knowledge Network Histogram Tools at:
http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

Migratory birds that may be affected by your project:

There are 21 birds on your migratory bird list. The list may include birds occurring outside this FWS office jurisdiction.

Species Name	Bird of Conservation Concern (BCC)	Seasonal Occurrence in Project Area
American bittern *(Botaurus lentiginosus)*	Yes	Breeding
Bald eagle *(Haliaeetus leucocephalus)*	Yes	Year-round
Black tern *(Chlidonias niger)*	Yes	Breeding
Black-billed Cuckoo *(Coccyzus erythropthalmus)*	Yes	Breeding
Blue-winged Warbler *(Vermivora pinus)*	Yes	Breeding
Bobolink *(Dolichonyx oryzivorus)*	Yes	Breeding
Brown Thrasher *(Toxostoma rufum)*	Yes	Breeding
cerulean warbler *(Dendroica cerulea)*	Yes	Breeding
Common tern *(Sterna hirundo)*	Yes	Breeding
Dickcissel *(Spiza americana)*	Yes	Breeding
Golden-Winged Warbler *(Vermivora chrysoptera)*	Yes	Breeding
Henslow's sparrow *(Ammodramus henslowii)*	Yes	Breeding
Least bittern *(Ixobrychus exilis hesperis)*	No	Breeding
Marsh wren *(Cistothorus palustris)*	Yes	Breeding
Peregrine Falcon *(Falco peregrinus)*	Yes	Breeding

Pied-billed Grebe *(Podilymbus podiceps)*	Yes	Breeding
Red-headed Woodpecker *(Melanerpes erythrocephalus)*	Yes	Breeding
Short-eared Owl *(Asio flammeus)*	Yes	Wintering
Upland Sandpiper *(Bartramia longicauda)*	Yes	Breeding
Willow Flycatcher *(Empidonax traillii)*	Yes	Breeding
Wood Thrush *(Hylocichla mustelina)*	Yes	Breeding

Appendix C: NWI Wetlands

Wetlands data for your project area was not available at the time of this species list request.

From: Wes Andrews
To: Firman, Lynnette (MDOT)
Subject: Dort Hwy Extension Genesee County
Date: Thursday, November 03, 2016 5:40:21 AM

Dear Ms. Firman,

We have reviewed this project.

There are no known cultural resources associated with our tribe that will be impacted by this undertaking.

Feel free to contact me at any time if you have questions or comments.

Best regards,

Wesley Andrews
THPO & NAGPRA Officer
The Little Traverse Bay Bands of Odawa Indians
7500 Odawa Circle
Harbor Springs, MI 49740

(231) 670-0713

(231) 242-4851 (Fax)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 0 1 2015

REPLY TO THE ATTENTION OF:

E-19J

Mark Lewis
Federal Highway Administration – Michigan
315 W. Allegan, Room 201
Lansing, Michigan 48933

Re: Scoping Request for Dort Highway (M-54) Extension, Grand Blanc Township, Genesee County, Michigan

Dear Mr. Lewis:

The U.S. Environmental Protection Agency has received the scoping request for the above-mentioned project, dated July 27, 2015. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

The Genesee County Road Commission, in cooperation with the Federal Highway Administration (FHWA) and the Michigan Department of Transportation (MDOT), propose to extend Dort Highway (M-54) south of I-75 to connect with Baldwin Road along a new alignment. The preliminary design includes one lane in each direction, turn lanes at select intersections, a ten-foot wide shared use path on one side of the road for pedestrians and bicyclists, and a five-foot wide sidewalk on the other side for pedestrians. FHWA and MDOT expect to prepare an Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI).

As stated in your July 27, 2015 letter, part of the purpose and need for the proposed project is to serve the Genesys Health Park Campus and to "enhance existing and proposed opportunities for additional new commercial, industrial, medical and residential development in southern Genesee County." Based on the information provided, EPA has the following comments for consideration in the Draft EA.

Aquatic Resources

Wetlands

Based on preliminary analyses, EPA believes jurisdictional wetlands and streams could be located within the project area. It is important for the Draft EA to discuss direct and indirect impacts to aquatic resources within and surrounding the project area that may result from the proposed actions and induced growth as a result of the proposed project. Examples of indirect impacts include: runoff, contamination, sedimentation, or changes to hydrology of the remaining portions of wetlands, rivers, and streams.

Placement of fill materials into Waters of the U.S. would require that the project comply with the Section 404(b)(1) guidelines under the Clean Water Act (CWA). These guidelines are summarized as follows:

- Least Environmentally Damaging Practicable Alternative (LEDPA) – There must be no practicable alternative to the proposed discharge (impacts) that would have less adverse impacts on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences;
- No Violation of Other Laws – The proposed project must not cause or contribute to violation of state water quality standards or toxic effluent standards, and must not jeopardize the continued existence of federally-listed endangered or threatened species or their critical habitat(s);
- No Significant Degradation – The project must not cause or contribute to significant degradation of Waters of the United States; and
- Minimization and Mitigation of Adverse Impacts – The project must include appropriate and practicable steps to avoid impacts to regulated Waters of the United States. Where impacts are unavoidable, there must be documentation on how impacts have been minimized. Finally, compensatory mitigation to offset unavoidable, minimized impacts to the aquatic ecosystem must be provided.

While we offer the following comments to inform the Draft EA, EPA reserves its right to provide additional comments regarding this project if it is later determined that a Michigan Department of Environmental Quality CWA Section 404 permit will be needed.

Recommendations:

- Include an analysis of prudent and feasible alternatives for proposed impacts to all Waters of the United States, including wetlands. Describe project modifications to avoid and/or minimize impacts to Waters of the U.S. in order to best maintain aquatic resource functions, values, and habitat. Alternatives should also include, where feasible, project components that support and improve the existing aquatic ecosystems.
- Include a robust discussion on CWA Section 404 permitting and a description of CWA Section 401 Water Quality Certification requirements.
- Discuss any proposed mitigation, including mitigation sequencing per the CWA Section 404(b)(1) guidelines, and describe of how mitigation will comply with the 2008 Mitigation Rule (40 CFR 230). Include information on mitigation ratios and type(s) of wetlands that will be restored or created and how wetland hydrology and wetland plant communities will be established at mitigation sites. If a mitigation bank will be used, the Draft EA should identify the name and location of the bank and status of available credits. Any mitigation commitments should be detailed in the FONSI.

If impacts to wetlands are unavoidable, we recommend that the Draft EA and FONSI include commitments to implement the following measures to minimize impacts during construction:

- Perform construction in wetlands during frozen ground conditions, if feasible.
- Minimize width of temporary access roads.

- Use easily-removed materials for construction of temporary access roads and staging areas (e.g., swamp/timber mats) in lieu of materials that sink (e.g., stone, rip-rap, wood chips).
- Use swamp/timber mats or other alternative matting to distribute the weight of the construction equipment. This will minimize soil rutting and compaction.
- Use vehicles and construction equipment with wider tires or rubberized tracks, or use low-ground-pressure equipment to further minimize impacts during construction access and staging.
- Use long-reach excavators, where appropriate, to avoid driving or staging in wetlands; Place mats under construction equipment to contain any spills.

Water Quality

The proposed project will result in an increase in impervious surfaces in the study area. This will increase the amount of stormwater runoff that will need to be collected and stored before natural infiltration can fully occur. The Draft EA should consider future, more intense and frequent rainfall events in modeling and designing its stormwater management plan. Any mitigation measures should be committed to in the FONSI.

Recommendations:

- Stormwater data from climate change models should be used to determine what volume of stormwater management capacity will be needed for this project during its useful life. That enhanced capacity should include enough storage to temporarily retain the volume of stormwater that is produced by 100-year and 500-year storm events.
- Due to potential surface water quality issues, we recommend stormwater from bridges and roadway surfaces not be discharged directly to waters of the U.S. Rather, stormwater should be channeled toward green infrastructure, such as bioswales, that would allow first flush road pollutants to be captured prior to discharge to surface waters.
- We understand that most state highways cannot be constructed using pervious, permeable, or porous surfaces due to safety; however, EPA recommends use of such surfaces on shared-use paths and sidewalks. Use of these technologies will help to minimize stormwater runoff and improve water quality.

Land Use

EPA notes part of the purpose of this project is to "enhance existing and proposed opportunities for additional new commercial, industrial, medical and residential development" in the area.

Recommendation: The Draft EA should include an analysis of direct, indirect, and cumulative impacts on land use as a result of the proposed project. This should include any reasonably foreseeable impacts as a result of induced growth along the extended portion of the corridor. Any regional or county-wide smart growth or land use plans should be included and incorporated into the development of access roads and other infrastructure to support the extension.

Multi-modal use of any route is an important element to smart growth. EPA commends FHWA and MDOT for including a shared-use path on one side of the road and a sidewalk on the other. EPA understands that the proposed extension would serve the Genesys Health Park Campus; it is

unclear what other community resources the road would access (such as residential areas, schools, parks, etc.) It is unclear whether bus routes would be planned for the newly-built extension.

Recommendations:

- Incorporate smart growth principles wherever possible. We recommend linking the proposed shared-use path and sidewalk to locations used by the community, in addition to the Genesys Health Park Campus (e.g., schools, shopping, residences). The Draft EA should also consider linking the shared-use path to recreational facilities like parks or trails.
- The Draft EA should detail whether bus routes are planned for the new section of road, connecting residential areas to the Genesys Health Park Campus and other destinations. Bus access provides an important link to the hospital for visitors and employees, as well as keeping cars off the road.

Based on the project location and potential new corridor alignment, EPA reasonably expects impacts to upland trees and other vegetation.

Recommendation:

- To the greatest extent possible, impacts to upland trees and other vegetation should be identified in Draft EA. Any impacts should be minimized or otherwise mitigated for. Any mitigation commitments should be include in the FONSI.
- EPA recommends use of native vegetation along the corridor extension. We recommend using low-growing species that need less frequent mowing. Appropriate plant species lists can be obtained for the Michigan Department of Natural Resources. The Draft EA should also include measures of success for native vegetation along the corridor (for instance, percent of non-native invasive species allowed within the plot, etc.), the intended monitoring period, and any adaptive management triggers.
- EPA recommends mitigating for upland tree loss at a 1:1 ratio. The Draft EA should include measures of success for planted upland trees and the intended monitoring period. Any adaptive management triggers should also be identified.

Greenhouse Gas and Climate Change

On December 18, 2014, the Council on Environmental Quality (CEQ) released revised draft guidance for public comment that describes how Federal departments and agencies should consider the effects of greenhouse gas (GHG) emissions and climate change in their NEPA reviews. The revised draft guidance supersedes the draft GHG and climate change guidance released by CEQ in February 2010. The new guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated GHG emissions, and the implications of climate change for the environmental effects of a proposed action.

Recommendations:

- Examine opportunities to minimize GHG emissions associated with construction the corridor to the extent feasible. For example, energy efficiency, renewable energy, and

electric motors should be considered in construction contractor work plans and in the purchase of maintenance equipment, machinery, and vehicles.

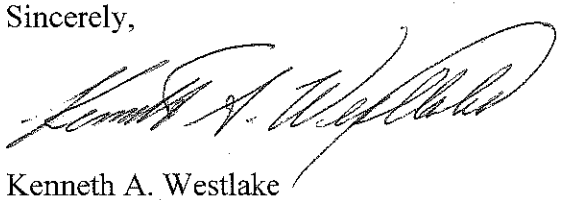
- Consider EPA's diesel emission reduction strategies, enclosed, for options to reduce emissions in order to be more protective of human health and the environment. Any commitments to reduce diesel emissions should be included in the FONSI.
- In addition, EPA recommends that FHWA and MDOT consider adaptation and resiliency measures to address impacts on the proposed project from changing climate conditions, such as increased intensity and frequency of storm and flood events and increased heat stress on infrastructure. We recommend reviewing predicted changes for the Midwest in the National Climate Assessment report on www.globalchange.gov.

Consultation and Coordination

The Draft EA should include consultation and coordination documentation, including but not limited to: U.S. Fish and Wildlife Service and Michigan Department of Natural Resources regarding state and federally listed threatened and endangered species; and, the State Historic Preservation Office on historic resources.

Thank you in advance for your consideration of our comments. We appreciate the opportunity to provide input early in the decision-making process. If you have any questions, feel free to contact me or Elizabeth Poole of my staff at poole.elizabeth@epa.gov or 312-353-2087.

Sincerely,



Kenneth A. Westlake
Chief, NEPA Implementation Section
Office of Enforcement and Compliance Assurance

Enclosure (1): Diesel Emission Reduction Checklist

Cc: Jason Smith, WadeTrim
Chris Clampitt, Michigan Department of Environmental Quality
Keith Brown, Michigan Department of Transportation
Fred Peivandi, Genesee County Road Commission

U.S. Environmental Protection Agency
Diesel Emission Reduction Checklist

- Use low-sulfur diesel fuel (15 ppm sulfur maximum) in construction vehicles and equipment.
- Retrofit engines with an exhaust filtration device to capture diesel particulate matter before it enters the construction site.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, reducing the fume concentration to which personnel are exposed.
- Use catalytic converters to reduce carbon monoxide, aldehydes, and hydrocarbons in diesel fumes. These devices must be used with low sulfur fuels.
- Use enclosed, climate-controlled cabs pressurized and equipped with high efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.
- Regularly maintain diesel engines, which is essential to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance. For example, blue/black smoke indicates that an engine requires servicing or tuning.
- Reduce exposure through work practices and training, such as turning off engines when vehicles are stopped for more than a few minutes, training diesel-equipment operators to perform routine inspection, and maintaining filtration devices.
- Repower older vehicles and/or equipment with diesel- or alternatively-fueled engines certified to meet newer, more stringent emissions standards. Purchase new vehicles that are equipped with the most advanced emission control systems available.
- Use electric starting aids such as block heaters with older vehicles to warm the engine reduces diesel emissions.
- Use respirators, which are only an interim measure to control exposure to diesel emissions. In most cases, an N95 respirator is adequate. Workers must be trained and fit-tested before they wear respirators. Depending on work being conducted, and if oil is present, concentrations of particulates present will determine the efficiency and type of mask and respirator. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a NIOSH approval number.
- Per Executive Order 13045 on Children's Health[1], EPA recommends operators and workers pay particular attention to worksite proximity to places where children live, learn, and play, such as homes, schools, daycare centers, and playgrounds. Diesel emission reduction measures should be strictly implemented near these locations in order to be protective of children's health.

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[1] Children may be more highly exposed to contaminants because they generally eat more food, drink more water, and have higher inhalation rates relative to their size. Also, children's normal activities, such as putting their hands in their mouths or playing on the ground, can result in higher exposures to contaminants as compared with adults. Children may be more vulnerable to the toxic effects of contaminants because their bodies and systems are not fully developed and their growing organs are more easily harmed. EPA views childhood as a sequence of lifestages, from conception through fetal development, infancy, and adolescence.

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

November 23, 2015

Mr. Jason T. Smith, AICP
Professional Planner
Wade Trim Associates, Inc.
500 Griswold Avenue
Detroit, Michigan 48226

Dear Mr. Smith:

SUBJECT: Early Coordination Dort Highway (M-54), Grand Blanc Township, Genesee County, Department of Environmental Quality (DEQ), Water Resources Division (WRD) File Number 2AV-K9RK-4MHV

Thank you for your July 27, 2015, early coordination letter regarding a proposed Environmental Assessment evaluating the extension of Dort Highway (M-54) from I-75 to Baldwin Road on a new alignment (T6N, R7E, Sections 21 and 28, of Grand Blanc Township, Genesee County). The proposed design will include one lane in each direction, turn lanes at intersections, a ten-foot wide shared path on one side, and a five-foot wide sidewalk on the other side. The objective of the project is to enhance the transportation network serving the Genesys Health Park Campus as well as enhancing existing and proposed opportunities for new commercial, industrial, medical and residential development in southern county.

The WRD has the following comments.

a) Based on the map that was provided, it appears the project will impact two unnamed tributaries to Swartz Creek. Permits will be required under Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). Any proposed stream crossings should, at a minimum, span the bankfull width of each stream and be properly recessed and aligned with the stream. If the drainage area of either stream is 2 square miles or greater than a permit would also be required under the State's Floodplain Regulatory Authority, found in Part 31, Water Resources Protection of the NREPA. A hydraulic analysis comparing existing and propose conditions would be required with a Part 31 application.

b) There are two relatively large wetland complexes along the proposed route near the unnamed streams. Wetland impacts will require a permit under Part 303, Wetlands Protection, of the NREPA. Part 303 requires that wetland impacts be avoided when possible and otherwise impacts must be minimized and mitigated for at ratios described in Part 303. It is recommended that the proposed route be thoroughly reviewed for potential wetland impacts.

c) There do not appear to be any recent occurrences of listed threatened or endangered species along the proposed route. However if there is tree clearing involved then the project should be evaluated for potential impacts to the federally endangered Indiana Bat.

d) A National Pollution Discharge Elimination System (NPDES) permit will be required for storm water discharges associated with construction activities in accordance with Rule 2190 promulgated in accordance with Part 31, Water Resources Protection, of the Natural Resources Environmental Protection Act, 1994 PA 451, as amended.

If you have any further questions, or wish to arrange a site inspection, please contact Mr. John Skubinna of our office at 517-284-5501, skubinnaj@michigan.gov; or you may contact me at fulcherg@michigan.gov; or DEQ, WRD, P.O. Box 30458, Lansing, Michigan 48909-7958.

Sincerely,

Gerald W. Fulcher, Jr., P.E., Chief
Transportation and Flood Hazard Unit, WRD
517-284-5504

cc: Ms. Mary Vanderlaan, DEQ, WRD
Mr. John Skubinna, DEQ-WRD
Mr. Chris Clampitt, DEQ-WRD

STATE OF MICHIGAN
RICK SNYDER
GOVERNOR

MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY
STATE HISTORIC PRESERVATION OFFICE

KEVIN ELSENHEIMER
EXECUTIVE DIRECTOR

December 9, 2016

PATRICK MARCHMAN
FEDERAL HIGHWAY ADMINISTRATION
315 W ALLEGAN STREET ROOM 201
LANSING MI 48933

RE: ER17-46 Dort Highway (M-54) Extension Connector from Baldwin Road to I-75, Sec. 20, 21, 28 & 29, T6N, R7E, Grand Blanc Township, Genesee County (FHWA)

Dear Mr. Marchman:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that **no historic properties are affected** within the area of potential effects of this undertaking.

This letter evidences the FHWA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of the FHWA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." **If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.**

We remind you that federal agency officials or their delegated authorities are required to involve the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties per 36 CFR § 800.2(d). The National Historic Preservation Act also requires that federal agencies consult with any Indian tribe and/or Tribal Historic Preservation Officer (THPO) that attach religious and cultural significance to historic properties that may be affected by the agency's undertakings per 36 CFR § 800.2(c)(2)(ii).

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at 517-335-2721 or by email at GrennellB@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Brian G. Grennell
Cultural Resource Management Specialist

for Brian D. Conway
State Historic Preservation Officer

SAT:BGG

Copy: Elaine Robinson, Commonwealth Heritage Group, Inc.

USDA

United States Department of Agriculture

Natural
Resources
Conservation
Service

Michigan State Office

3001 Coolidge Road
Suite 250
East Lansing, MI
48823-6321

Telephone:
(517) 324-5270
Fax:
(855) 701-4363

www.mi.nrcs.usda.gov

August 25, 2015

Mr. Jason T. Smith, AICP
Wade Trim Associates, Inc.
500 Griswold Avenue
Suite 2500
Detroit, Michigan 48226

Dear Mr. Smith:

The Natural Resources Conservation Service (NRCS) under Part 523 of the Farmland Protection Policy Act has reviewed the proposed Dort Highway (M-54) Extension Project. This review was conducted with respect to the effect(s) that the proposal may have on prime and/or unique farmland. Subpart B of Part 523 of the Farmland Protection Policy Act states that 'lands identified as "urbanized area" (UA) on the Census Bureau maps' are not covered by the act. Since the area of the proposed project extent is UA on the 2010 Census Bureau reference map for Flint, Michigan, we have concluded that this proposal will have no negative impact on prime and/or unique farmland.

Should the scope of the project change to where expansion will occur, please resubmit the proposal for our review.

Sincerely,

GARRY LEE
State Conservationist

cc:
Albert Jones, Area Conservationist, NRCS, Flint, Michigan
James Woodruff, District Conservationist, Flint, Michigan

APPENDIX B

PROJECT AREA CONTAMINATION SURVEY (PACS) REPORT

AKTPEERLESS

ENVIRONMENTAL DESKTOP REVIEW

Proposed Corridor Extension of Dort Highway (M-54) South from I-75/M-54 North (Exit 109) to Baldwin Road

PREPARED FOR Rowe Professional Services Company
540 South Saginaw Street, Ste. 200
Flint, Michigan 48502

PROJECT # 11637s-1-15

DATE June 13, 2016

Table of Contents

1.0 Introduction

Rowe Professional Services Company (Rowe) retained AKT Peerless to complete a Limited Environmental Desktop Review for the Proposed Corridor Extension of Dort Highway (M-54) South from I-75/M-54 North (Exit 109) to Baldwin Road in Grand Blanc Township, Genesee County, Michigan (study corridor).

1.1 Purpose

The purpose of AKT Peerless' Limited Environmental Desktop Review is to provide a low-cost, minimally exhaustive and flexible alternative to ASTM Practices E 1528 and E 1527, in an attempt to identify obvious environmental concerns. The limited environmental desktop review is a reasonable level of effort designed to identify obvious environmental concerns associated with the study corridor that represents potential exposure, and is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental concerns in connection with the study corridor.

The limited environmental desktop review is not intended to satisfy any innocent land owner defense or offer any liability protection. The proposed limited environmental desktop review will be completed to meet the National Environmental Policy Act (NEPA) Environmental Contamination requirement for their Environmental Assessment (EA) purposes only, and is not sufficient environmental due diligence for any defense to environmental liability under the Comprehensive Environmental Response Compensation Liability Act (CERCLA), as amended, and does not meet ASTM E-1527 Standard Practice for Environmental Site Assessment, and/or All Appropriate Inquiries (AAI), as defined in the Small Business Liability Relief and Brownfields Revitalization Act-40 CFR Part 312, as amended.

1.2 Scope of Services

AKT Peerless' scope-of-services is based on its proposal PS-19334, dated March 25, 2016, and the terms and conditions of that agreement. This limited environmental desktop review includes the following:

- A review of previous environmental reports and maps provided to AKT Peerless by the Client.
- A review of current environmental database information compiled by a variety of regulatory agencies to evaluate potential environmental concerns associated with the study corridor, adjoining properties, and other sites that are: (1) identified on target lists and (2) within varying distances of up to one mile from the study corridor.
- Summary letter report.

1.3 Reliance

This limited environmental transaction screen was completed for the sole use of Rowe, and no other party may rely on the contents or conclusions.

2.0 Client Provided Information

Rowe provided AKT Peerless with a DRAFT Environmental Assessment (EA) for the proposed extension of the M-54 corridor south from I-75 to Baldwin Road in Genesee County, Michigan (herein the study corridor), prepared by the Genesee County Road Commission. The EA indicates that the study corridor is defined as 600 acres of land between the southerly terminus of Dort Highway (M-54) south to Baldwin Road. A map depicting the study corridor is attached as Appendix A.

3.0 Study corridor Overview

3.1 Location and Property Description

The study corridor is located between the I-75/M-54 North (Exit 109) interchange south to Baldwin Road, east to the Genesys Health Park property, and west to McWain Road. The study corridor consists of over 100 parcels of land primarily owned by private residences, Consumers Energy, and Genesys Health Park. The study corridor also contains alternate routes for the proposed undertaking including the McWain Road option and the Utility Easement option.

3.2 Vicinity Characteristics

The study corridor is located in an area of Grand Blanc Township zoned for commercial and residential purposes.

3.3 Description of Structures and Other Improvements

As stated in Section 3.1, the study corridor contains over 100 distinct parcels of land. This area contains private residences, out-buildings, commercial structures, a hospital campus, paved roads, vegetated areas (wooded and grass lands), lowlands, roadside county ditches, ponds, and underground utilities (i.e. municipal water, sanitary sewer, natural gas, electric, and communications). The proposed Utility Easement option with not involve the removal of any permanent structures. The proposed McWain Road option will involve the removal of at least two residential structures

Dort Highway Corridor Extension will not involve the removal of any permanent structures or utilities

3.4 Utilities and Municipal Services

AKT Peerless identified the type and supplier of utilities provided to the area of the study corridor. These services are described in the following table:

Study corridor Utility Data

Utility / Service	Type	Utility Company or Municipality
Heat	Natural gas	Consumers Energy
Potable water	Municipal and wells	Grand Blanc Township/ Private
Electricity	Electric lines	Consumers Energy
Sewage disposal	Municipal and septic	Grand Blanc Township

4.0 Records Review

The objective of the records review is to evaluate reasonably ascertainable databases, historical records, and physical setting records to help identify environmental concerns at the study corridor and, to the extent identifiable, at surrounding properties.

4.1 Physical Setting Sources

AKT Peerless reviewed various available physical setting sources about the geologic, hydrogeologic, hydrologic, and topographic characteristics that may affect potential contaminant migration to the study corridor, or within or from the study corridor. The results of AKT Peerless' review are presented in the following table:

Physical Setting Data

Physical Setting Information		Data Sources
General Topography and Hydrogeology		
Study corridor Elevation	Elevation of the study corridor primarily ranges from approximately 850 and 900 feet above the National Geodetic Vertical Datum	USGS' Topographic Map of the Flint South, Michigan Quadrangle (2014)
Topographic Gradient	Topography in the area of the study corridor appears to declines from the south to the north.	
Closest Surface Water	The study corridor is located within the Swartz Creek Watershed. Several intermittent streams, drains, lowlands, and ponds are located throughout the study corridor. Surface water in the area of the study corridor, flows to the north.	
General Soil and Geology		
Bedrock	Meramecian Series of the Mississippian System in the Paleozoic Era	MDNR Geological Survey Division's *Bedrock Geology of Southern Michigan* (1987)
Quaternary Soil Description	Medium-textured glacial till, described as gray, grayish brown or reddish brown, nonsorted glacial debris; matrix is dominantly loam and silt loam texture, variable amounts of cobbles and boulders. Occurs as a ground moraine, till plain or undifferentiated ground moraine-end moraine complexes. Includes small areas of coarser or finer-textured tills, as well as small areas of outwash. Thickness: highly variable locally, from less than 10 meters to as much as 20 to 30 meters.	Michigan Geological Survey Division's publication, *Quaternary Geology of Southern Michigan* (1982)

Physical Setting Information		Data Sources
County Soil Survey Description	Brookston loam, Celina loam (6 to 9 percent slopes), Celina-Conover loams (2 to 6 percent slopes), Celina-Owosso loams (2 to 6 percent slopes), Conover loam (0 to 2 percent slopes), Conover loam (2 to 6 percent slopes), Conover-Metamora sandy loams (2 to 6 percent slopes), Lenawee silty clay loam (0 to 1 percent slopes), Linwood muck, Houghton muck (0 to 1 percent slopes), Miami loam (6 to 12 percent slopes), Miami loam (12 to 18 percent slopes), Sloan silt loam (occasionally flooded), Water	USDA Natural Resources Conservation Service Web Soil Survey
Site-Specific Geology and Hydrogeology		
Soil and bedrock characteristics	No site-specific soil or bedrock information was identified.	Not applicable
Groundwater characteristics	No site-specific groundwater information was identified.	Not applicable

Based on the information presented above, AKT Peerless infers that groundwater in the vicinity of the study corridor flows toward the north, with potential influence from the Swartz Creek Watershed. However, local manmade structures (e.g., buildings, roads, sewer systems, and utility service lines) may influence both surface water and groundwater flow. AKT Peerless was unable to precisely document the groundwater flow direction beneath the study corridor. To determine the site-specific groundwater flow direction, subsurface information would be necessary.

4.2 Standard Environmental Record Sources

AKT Peerless retained a third-party vendor to provide current environmental database information compiled by a variety of federal and state regulatory agencies. The purpose of obtaining this data was to evaluate potential environmental risks associated with the study corridor, adjoining properties, and nearby sites that are: (1) identified on target lists and (2) within varying distances of up to one mile from the study corridor. Refer to the database report included as Appendix B for information regarding database descriptions, search radii, and most recent dates the database information was updated by the vendor.

4.2.1 Study Corridor Listings

The database report does not identify the study corridor on the referenced databases, except for the following:

Detail Table for Northern Study Corridor Listing

Address	Name	Location	Known/Inferred Groundwater Flow Direction:
8166 Embury Road	Grand Blanc II	This site is located within the northern portion of the study corridor.	Inferred north
Databases			
Facility Index System (FINDS) The site is listed on the FINDS Database. FINDS is an index of identification numbers associated with a property or facility that EPA has investigated or has been made aware of in conjunction with various regulatory programs. No hazardous waste violations were identified. Due to regulatory status of this site and lack of records pertaining to a release of any hazardous substances and/or petroleum products, this listing does not represent an environmental concern to the study corridor.			

Detail Table for Northern Study Corridor Listing

Address	Name	Location	Known/Inferred Groundwater Flow Direction:
8170 Embury Road	Barron Precision Instruments	This site is located within the northern portion of the study corridor.	Inferred north
Databases			
FINDS The site is listed on the FINDS Database. FINDS is an index of identification numbers associated with a property or facility that EPA has investigated or has been made aware of in conjunction with various regulatory programs. No hazardous waste violations were identified. Resource Conservation and Recovery Act-Small Quantity Generator (RCRA-SQG) The site is listed as a RCRA SQG of hazardous waste. Two hazardous waste violations or enforcements were identified within the report. The violations were issued in September 2014. A date of compliance for both violations is not reported. No other information regarding these violations were reported. Waste Data System (WDS) The site is listed on the WDS database. No information regarding waste management/disposal activities were provided. Due to regulatory status of this site and lack of records pertaining to a release of any hazardous substances and/or petroleum products, this listing does not represent an environmental concern to the study corridor.			

Detail Table for Northern Study Corridor Listing

Address	Name	Location	Known/Inferred Groundwater Flow Direction:
8018 Embury Road	Chippewa Management LLC	This site is located within the northern portion of the study corridor.	Inferred north
Databases			
FINDS The site is listed on the FINDS Database. FINDS is an index of identification numbers associated with a property or facility that EPA has investigated or has been made aware of in conjunction with various regulatory programs. No hazardous waste violations were identified. RCRA-Conditionally Exempt Small Quantity Generator (CESQG) The site is listed as a RCRA CESQG of hazardous waste. Three hazardous waste violations or enforcements were identified within the report. The violations were issued in September 2003. A date of compliance for two of the violations were reported in February 2010. A date of compliance listed for the violation regarding "Used Oil – Definitions" is not reported. No other information regarding these violations were reported. WDS The site is listed on the WDS database. No information regarding waste management/disposal activities were provided. Due to regulatory status of this site and lack of records pertaining to a release of any hazardous substances and/or petroleum products, this listing does not represent an environmental concern to the study corridor.			

Detail Table for Northern Study Corridor Listing

Address	Name	Location	Known/Inferred Groundwater Flow Direction:
8200 Embury Road	Loon Lake Precision	This site is located within the northern portion of the study corridor.	Inferred north
Databases			
WDS The site is listed on the WDS database. No information regarding waste management/disposal activities were provided. Due to regulatory status of this site and lack of records pertaining to a release of any hazardous substances and/or petroleum products, this listing does not represent an environmental concern to the study corridor.			

Detail Table for Northern Study Corridor Listing

Address	Name	Location	Known/Inferred Groundwater Flow Direction:
8242 Embury Road	Bullet Engineering LLC	This site is located within the northern portion of the study corridor.	Inferred north
Databases			
FINDS The site is listed on the FINDS Database. FINDS is an index of identification numbers associated with a property or facility that EPA has investigated or has been made aware of in conjunction with various regulatory programs. No hazardous waste violations were identified. WDS The site is listed on the WDS database. No information regarding waste management/disposal activities were provided. RCRA-Non Generator/No Longer Regulated (RCRA NonGen/NLR) The site is listed as a RCRA NonGen/NLR of hazardous waste. No hazardous waste violations or enforcements were identified within the report. Due to regulatory status of this site and lack of records pertaining to a release of any hazardous substances and/or petroleum products, this listing does not represent an environmental concern to the study corridor.			

Detail Table for Northern Study Corridor Listing

Address	Name	Location	Known/Inferred Groundwater Flow Direction:
8260 Embury Road	Premier Tooling	This site is located within the northern portion of the study corridor.	Inferred north
Databases			
WDS The site is listed on the WDS database. No information regarding waste management/disposal activities were provided. Due to regulatory status of this site and lack of records pertaining to a release of any hazardous substances and/or petroleum products, this listing does not represent an environmental concern to the study corridor.			

Detail Table for Eastern Study Corridor Listing

Address	Name	Location	Known/Inferred Groundwater Flow Direction:
1 Genesys Parkway	Genesys Regional Medical Center	This site is located within the eastern portion of the study corridor.	Inferred north
Databases			
RCRA SQG The site is listed as a RCRA SQG of hazardous waste. Three hazardous waste violations or enforcements were identified within the report. The violations were issued in September 2003. A date of compliance for two of the violations were reported in February 2010. A date of compliance listed for the violation regarding "Used Oil – Definitions" is not reported. No other information regarding these violations were reported. FINDS The site is listed on the FINDS Database. FINDS is an index of identification numbers associated with a property or facility that EPA has investigated or has been made aware of in conjunction with various regulatory programs. No hazardous waste violations were identified. WDS The site is listed on the WDS database. No information regarding waste management/disposal activities were provided. Michigan Aboveground Storage Tank (MI AST) The site currently operates two registered USTs containing Cl-#2 Low Sulfur. The tanks were all installed in 1996. No confirmed releases have been reported. Due to regulatory status of this site and lack of records pertaining to a release of any hazardous substances and/or petroleum products, this listing does not represent an environmental concern to the study corridor.			

4.2.2 Nearby Sites

AKT Peerless' review of the referenced databases also considered the potential or likelihood of contamination from sites, outside of the study corridor. To evaluate which of the nearby sites identified in the database report present an environmental risk to the study corridor, AKT Peerless considered the following criteria:

- Type of database on which the site is identified.
- Topographic position of the identified site relative to the study corridor.
- Direction and distance of the identified site from the study corridor.
- Local soil conditions in the study corridor area.
- Known or inferred groundwater flow direction in the study corridor area.
- Status of the respective regulatory agency-required investigation(s) of the identified site, if any.
- Surface and subsurface obstructions and diversions (e.g., buildings, roads, sewer systems, utility service lines, rivers, lakes, and ditches) located between the identified site and the study corridor.

Only those nearby sites that are judged to present a potential environmental risk to the study corridor are further evaluated by reviewing agency file information. Using the above criteria, and based upon a review of readily available information contained within the database report, AKT Peerless did not identify nearby sites that present a potential environmental risk to the study corridor.

5.0 Findings

AKT Peerless has performed a Limited Environmental Desktop Review of the Proposed Corridor Extension of Dort Highway (M-54) in Grand Blanc Township, Genesee County, Michigan, the study corridor. This Limited Environmental Desktop Review was completed in conformance with the scope of scope-of-services based on its proposal PS-19334, dated May 25, 2016.

5.1 Recognized Environmental Concerns

This Limited Environmental Desktop Review has revealed no obvious evidence of RECs in connection with the study corridor. No additional investigations are warranted to evaluate for the presence of contaminated soil, groundwater, air, or soil vapor.

5.2 Other Potential Concerns

In the event the McWain Road alternative is chosen as the proposed undertaking, at least two residential structures will be razed in order to complete the undertaking. A pre-demolition asbestos and other hazardous materials survey will be conducted. All asbestos containing materials and other hazardous materials will be abated and/or removed prior to demolition activities in accordance with applicable local, state, and federal requirements.

6.0 Limitations

The information and opinions obtained in this report are for the exclusive use of Rowe. No distribution to or reliance by other parties may occur without the express written permission of AKT Peerless. AKT Peerless will not distribute this report without your written consent or as required by law or by a Court order. The information and opinions contained in the report are given in light of a limited assignment. The report must be reviewed and relied upon only in conjunction with the terms and conditions expressly agreed upon by the parties and as limited therein. Any third parties, who have been extended the right to rely on the contents of this report by AKT Peerless (which is expressly required prior to any third-party release), expressly agrees to be bound by the original terms and conditions entered into by AKT Peerless and Rowe. This environmental desktop review does not consider third-party claims of liability and any costs related to environmental damage to the subject or surrounding properties.

In conjunction with a description of the current uses of the property and the operations and processes carried on at the property, AKT Peerless identified obvious aspects of such operations and processes, which may be subject to federal, state, or local environmental laws and regulations (e.g., hazardous waste generation, storage, and disposal; air emissions; wastewater and storm water discharges; etc.). Although AKT Peerless provides comments on obvious significant instances of non-compliance observed in the course of performing its review, which could reasonably be expected to impair the value of the study corridor or result in a significant financial liability for the owner/operator of the site (i.e., non-permitted discharges, over-accumulation of hazardous wastes by a SQG, unregistered USTs, etc.), an environmental compliance audit, or determination if the facility is in compliance with all applicable

regulations was not completed. Furthermore, an environmental compliance inspection by a regulatory authority could reveal instances of non-compliance and/or compliance deficiencies.

Subject to the above and the terms and conditions, AKT Peerless accepts responsibility for the competent performance of its duties in executing the assignment and preparing reports in accordance with the normal standards of the profession, but disclaims any responsibility for consequential damages. Although AKT Peerless believes that results contained herein are reliable, AKT Peerless cannot warrant or guarantee that the information provided is exhaustive or that the information provided by Rowe is complete or accurate.

7.0 Signatures of Environmental Professionals

The following consultants contributed to the completion of this report:

Jeff Carr
Project Manager
AKT Peerless
Great Lakes Regional Bay Office
Phone: 989.754.9896
Fax: 989.754.3804
carrj@aktpeerless.com

Ryan Londrigan
Group Leader
AKT Peerless
Great Lakes Regional Bay Office
Phone: 989.754.9896
Fax: 989.754.3804
londriganr@aktpeerless.com

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Qualifications

Ryan T. Londrigan

Group Leader CHMM

Mr. Londrigan has over 15 years of professional consulting experience focusing on client needs. Mr. Londrigan provides services in environmental due diligence, brownfield grants and loans, remediation, regulatory permitting, demolition and construction management, industrial hygiene, asbestos, air quality, and EHS compliance consulting.

PROFESSIONAL EXPERIENCE

Group Leader / Senior Project Manager
AKT Peerless Environmental & Energy Services

Project Manager
Global Environmental Engineering

Part 201/Due Diligence Department Manager
Applied EcoSystems – Great Lakes

CERTIFICATIONS

OSHA 29 CFR 190.120 40 Hour
Hazardous Waste Operations Training

Certified Hazardous Materials Manager

Certified Asbestos Building Inspector Michigan

Certified Lead Inspector – Michigan

Dow Chemical Site Safety Representative
40 hour

Michigan Certified Storm Water Operator
Industrial and Construction Sites

Thermo Fisher Scientific
Radiation Safety and Niton XRF Analyzers

Various Environmental Assessment and Compliance
Training/Workshops

Energy Auditor Training

Due Diligence University
Environmental Due Diligence (Volunteer Developer)

NIOSH 582 Equivalency Course
Method No. 7400

EDUCATION

BS: Resource Ecology, High Honors, 1999
University of Michigan, Flint, Michigan

AREAS OF EXPERTISE

- Environmental, Health, and Safety (EHS) compliance and auditing
- Baseline Environmental Assessments (BEAs)
- Phase I and II Environmental Site Assessments (ESAs)
- Brownfields Redevelopment and Financing
- Grant Management and Reporting
- Chemical Management and Disposal
- Underground Storage Tank (UST) Removal and Closure
- Asbestos, Lead, and Hazardous Material Assessments
- Wetland Assessments and Permitting
- Indoor Air Quality and Mold Surveys
- Bid Specifications and Contractor Oversight
- Employee Exposure Monitoring and Hazard Assessment
- Water Management and NPDES Permitting
- Surface Water Monitoring Studies
- Regulatory Permit Preparation
- Demolition and Redevelopment Consulting
- Air, Water, and Soil Environmental Investigations
- Remediation Design and Oversight
- Environmental and Safety Training
- Regulator Negotiation

SUMMARY OF SELECTED PROJECTS

Managed a redevelopment project for Gratiot County, the City of Alma, and a private developer at a 400,000 square foot industrial facility in Alma, Michigan, within an expedited schedule of 90 days. The project was the sole 2008 award winner from the United States Environmental Protection Agency (EPA) for "a significant contribution to the Region 5 Brownfields Program."

The project included federal closure of four RCRA Solid Waste Management Units. A Category "S" BEA and Due Care Plan were completed and affirmed by the MDEQ. An 85,000 square foot basement and over 20 press pits and vaults were characterized and remediated or closed. Over 40,000-gallons of hazardous and non-hazardous liquid waste was removed. Over 300 yards of highly impacted soils were removed from beneath the factory floor. Twenty-five tons of scrap metal and obsolete equipment was cleaned and recycled.

Managed a multi-phased project between 2007 and 2009 involving the redevelopment of the Former Osceola Refinery, in West Branch, Michigan. Work included management of MDEQ grants and loans, construction management, and installing a 4-acre cap. Due to impacts and use of State dollars, Mr. Londrigan oversaw all capping and underground construction activities to facilitate redevelopment for the new owner. Cost savings were implemented by incorporating historical investigations.

Completion of high profile environmental due diligence and redevelopment projects at former automotive manufacturing properties in Michigan including Buick City, Flint; Chevy in the Hole, Flint; GM Nodular Iron, Saginaw; and Ford, Ypsilanti.

Management of EPA Environmental Assessment and Cleanup Grants for Tuscola, Genesee, Saginaw, Mt. Pleasant, and Arenac Counties. Work includes site inventories, community outreach, budget management, drawdown audits, monthly board presentations, quarterly and annual reporting to EPA, completion of Phase I and Phase II ESAs, BEAs, hazardous material surveys, air monitoring, NEPA studies, and remediation planning.

Preparation of numerous state and federal grant applications including the successful award of over $6 million to municipalities.

Provided field oversight and reporting for diesel fuel release resulting from a vehicle accident on Interstate-96, near Novi, Michigan. Activities included: determining the extent of the release area, delineating regulated wetlands within the impacted area, wetland permitting, overseeing the excavation of approximately 1,000 yards of soil, collecting soil and groundwater verification samples, and submitting a closure report to the MDEQ.

Management of over 1 million square feet of demolition projects. Notable projects include the 8-story Plaza Hotel, Saginaw Mall, Midland County Jail, Mt. Pleasant Center, the separation of historic and downtown structures, and over 1,000 residences.

Management of NPDES and Clean Water Act compliance projects for various municipal and industrial clients. Projects included all storm water assessment, spill plans, storm water pollution prevention plans, site specific NPDES permits, no coverage determinations, site visits, routine inspections, and consent order negotiation. He works with clients to develop best management practices for significant materials, implement pollution prevention plans, and comply with consent orders.

Designed and implemented multi-year surface water investigations, stream e.coli monitoring studies, and groundwater discharge compliance.

Completed a Leaking Underground Storage Tank (LUST) closure for the release of gasoline and diesel fuel compounds at the General Motors Technical Center located in Warren, Michigan. The on-site impact was delineated via soil borings and the installation of monitoring wells. Project activities also included oversight of field technicians and coordination/ reporting to General Motors and the MDEQ. Unrestricted closure was granted by the MDEQ.

Conducted a multi-phased project for the purpose of bank foreclosure at an industrial facility in Flint, Michigan including a Phase I/II ESA and chemical disposal. Phase II activities included the delineation of on-site volatile and heavy metal impact. Disposal activities included: a chemical survey to identify the contents of up to 5,000 abandoned containers, segregation, waste characterization, profiling, bulking and lab packing, disposal coordination, and reporting to the MDEQ.

Performed site assessment activities at a manufacturing facility in Rochester, Michigan and identified two separate releases consisting of petroleum compounds and heavy metals. Conducted soil remediation to remove direct contact and volatilization exposures. Installed 12 monitoring wells and tested quarterly to assess groundwater impact. Conducted a mixing zone determination on the adjacent stream where impact was venting. Drafted deed restrictions and submitted a Remedial Action Plan to the MDEQ.

Performed an indoor air quality survey with a concentration on mold and asbestos at a four-story college campus building in southern Michigan. The inspection identified visual sources of water intrusion and mold amplification. Tape lifts and air sampling were conducted to identify areas of mold amplification. For abatement purposes, asbestos sampling was completed on impacted building materials.

On-going management of environmental health and safety compliance for industrial clients. Activities include waste management, employee exposure monitoring, SARA Title III, TRI documentation, air permit compliance, and on-call response/technical support.

Performed environmental compliance audits of waste vendors for a major automotive manufacturing company in Indiana, Ohio, and Canada on scrap steel and drum recycling facilities.

Jeff S. Carr

Project Manager

Mr. Carr has over 10 years of experience in environmental due diligence and assessment, environmental response activities, corrective action, and regulatory compliance management.

EDUCATION

BS: Environmental Resource Planning, 2005
University of Michigan-Flint

CERTIFICATIONS

State of Michigan Asbestos Building Inspector
Accreditation # A36083

OSHA 29 CFR 1910.120
40 and 8 Hour Refresher HAZWOPER Training

Certified Storm Water (Industrial Site)
Management Operator by the Michigan
Department of Environmental Quality
Certification # I-10223

PROFESSIONAL EXPERIENCE

Project Manager
AKT Peerless Environmental and Energy Services

Project Manager
Applied Ecosystems-Great Lakes, Inc.

AREAS OF EXPERTISE

- Completion of Phase I Environmental Site Assessments to meet or exceed ASTM standards
- Direct Phase II Subsurface Investigations to completion
- Site investigation activities associated with leaking underground storage tank sites
- The completion of Baseline Environmental Assessments
- Maintain direct client and regulatory agency contact
- Responsible for job costing and budgeting
- Interpretation of laboratory analytical results and technical report writing
- Groundwater and soil sampling
- Drinking water and waste water compliance

- Storm water management
- Pre-demolition asbestos and hazardous materials survey

SUMMARY OF SELECTED PROJECTS

Assisted with U.S. EPA Brownfield assessment grant management. The primary objective of each Brownfield grant was to perform Brownfield inventories, conduct Phase I and Phase II ESAs, Baseline Environmental Site Assessments and EPA quality assurance project plans (QAPPS).

Management of hundreds of ASTM E 1527 compliant Phase I ESAs, including proposal generation, cost analysis, project management, client communication, and invoicing for financial institutions, real estate developers, manufacturing facilities, and property managers.

Performed Phase I ESAs for real estate developers in accordance with ASTM E 1527, All Appropriate Inquiry, and Michigan State Housing Development Authority (MSHDA) Environmental Review Requirements.

Prepared Spill Prevention Control and Countermeasure/Pollution Incident Prevention (SPCC/PIP) Plans for automotive repair, salvage yard, and warehousing facilities.

Prepared Storm Water Pollution Prevention Plans for various sites including (1) a Michigan-based college campus, (2) multiple Michigan-based public transportation facilities, and (3) various Michigan-based industrial facilities.

Managed hundreds of Phase II subsurface investigations (including the coordination of soil boring and monitor well installation, laboratory data interpretation, and report completion), to (a) evaluate the potential presence of contaminants, (b) evaluate the type of contaminants, and (c) delineate horizontal and vertical extent. Additional activities included the preparation of Baseline Environmental Assessments and Documentation of Due Care Compliance to evaluate identified contamination at facilities for submittal to the Michigan Department of Environmental Quality.

Supervised Underground Storage Tank removal activities at sites in Michigan in accordance with state regulations. Field activities included contractor oversight, sample collection, analysis of laboratory results, and report preparation for submittal to state agencies.

Performed hundreds of pre-demolition asbestos and hazardous material inspections for various commercial and residential properties. Activities performed included the collection of suspect asbestos containing materials, quantification of asbestos containing materials and hazardous materials, and recommendations for handling identified materials.

Performed Construction Analysis Reviews and Construction Draw Reviews for projects ranging from restaurants to manufacturing facilities.

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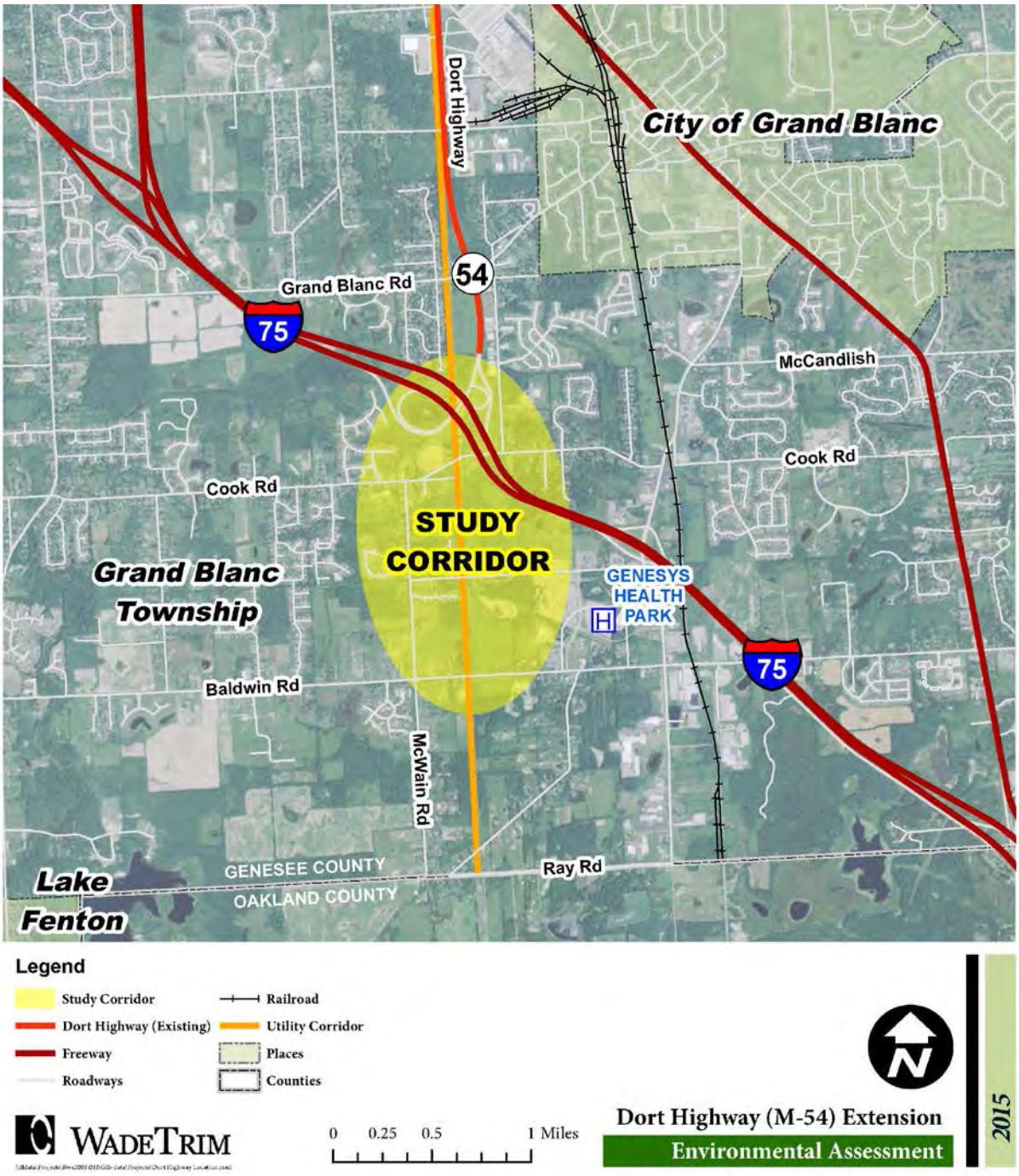
Appendix A

Study Corridor Maps

Figure 1-1. Dort Highway Location Map and Study Corridor



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540 S. Saginaw St., Ste. 200; P. O. Box 3748
Flint, MI 48502
O: (810) 341-7500
F: (810) 341-7573
www.rowepsc.com

DORT HIGHWAY ALTERNATES

DATE: 5-25-16

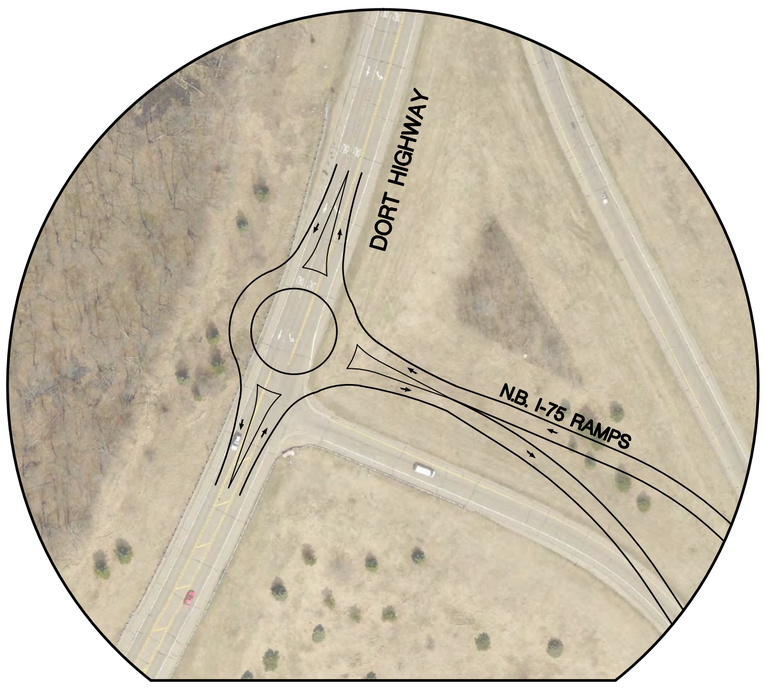
Legend

- Proposed Right of Way
- Parcel Line
- Wetland Boundary
- Floodplain

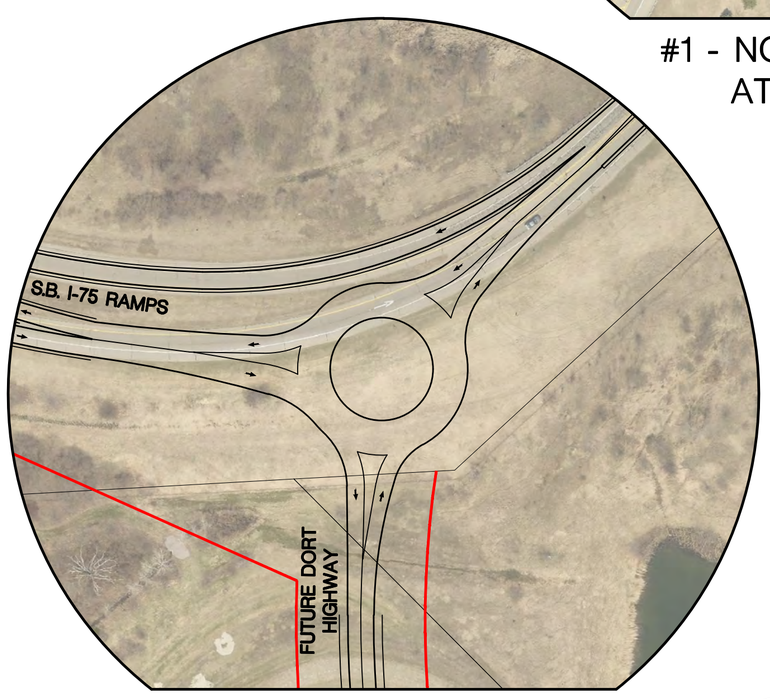
0 300 600

1 inch = 300 ft.

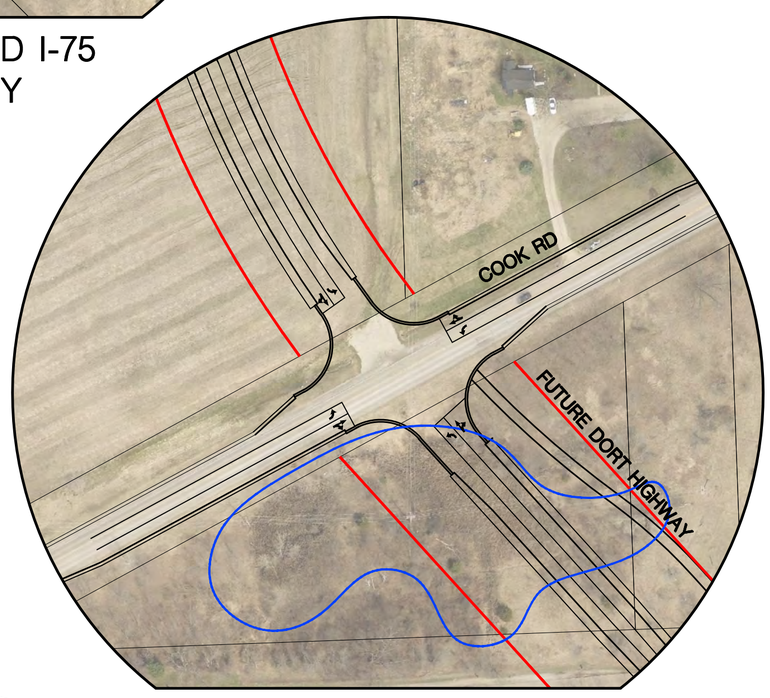
N W E S



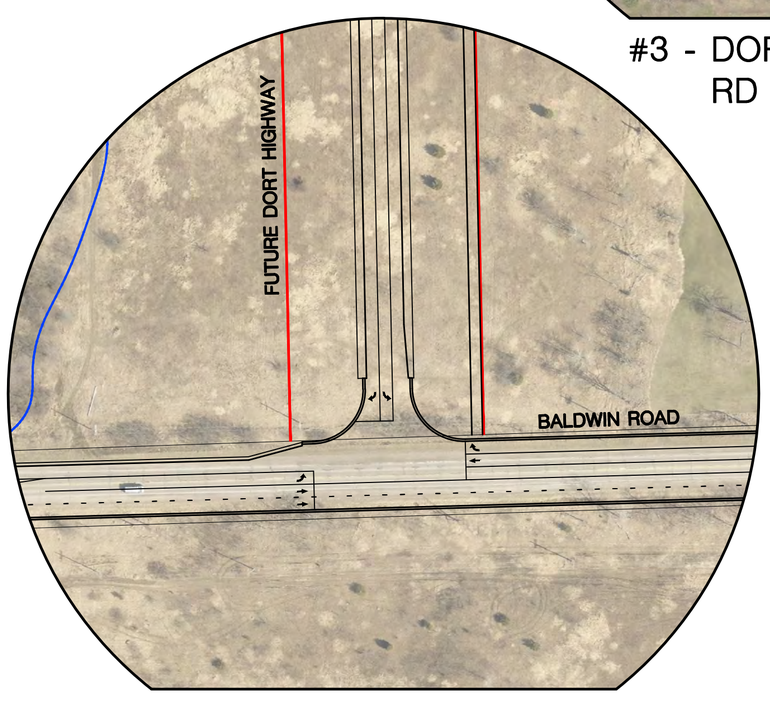
#1 - NORTHBOUND I-75 AT DORT HWY
SCALE: 1"=100'



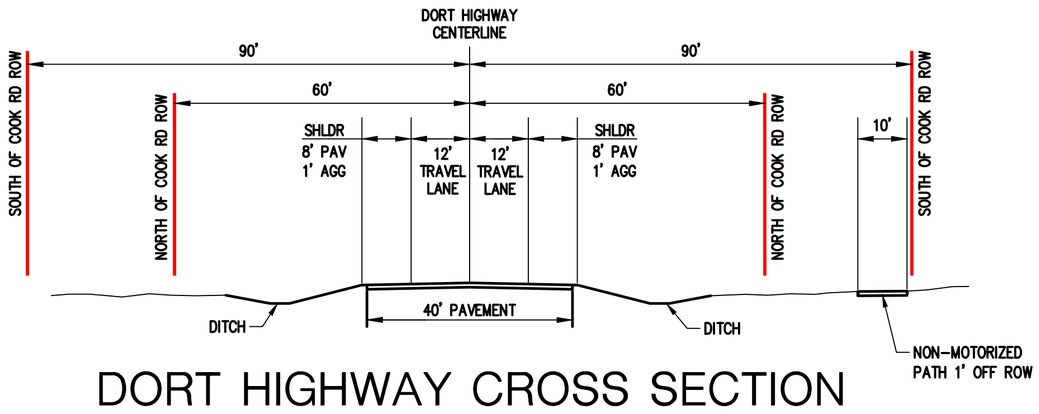
#2 - SOUTHBOUND I-75 AT DORT HWY
SCALE: 1"=100'



#3 - DORT HWY AND COOK RD INTERSECTION
SCALE: 1"=100'



#4 - DORT HWY AND BALDWIN RD INTERSECTION
SCALE: 1"=100'

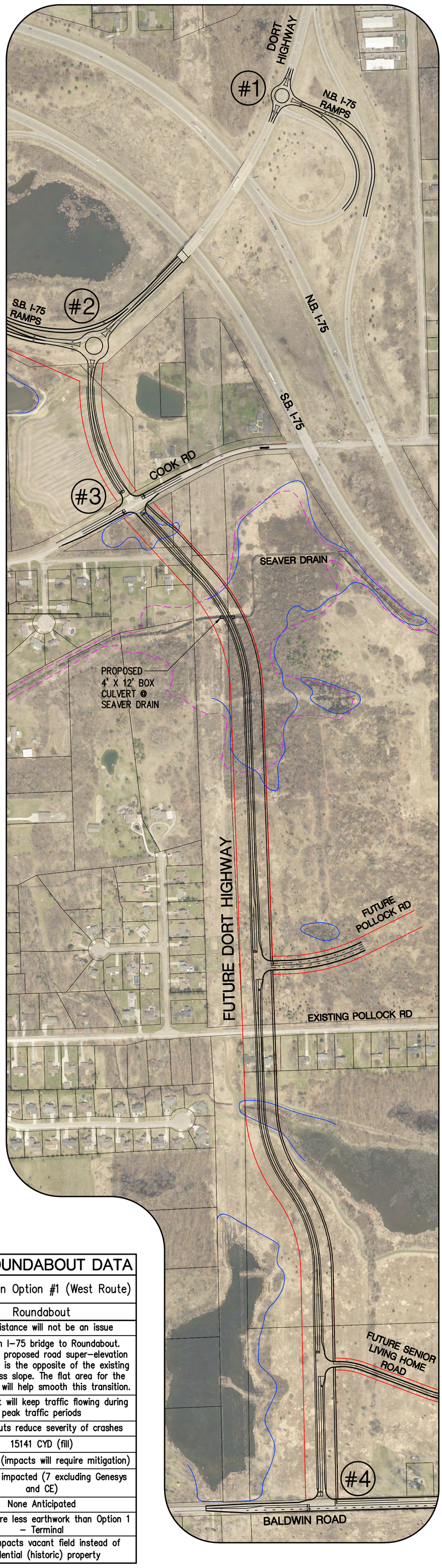


DORT HIGHWAY CROSS SECTION
NOT TO SCALE

OPTION #1 ROUNDABOUT

Description:

DORT HIGHWAY – BALDWIN RD TO I-75, 2 LANES WITH STANDARD INTERSECTION AT COOK ROAD AND ROUNDABOUTS AT SB I-75 RAMPS AND NB I-75 RAMPS AND DORT HIGHWAY.



OPTION #1 - ROUNDABOUT DATA	
Criteria Element	Connection Option #1 (West Route)
	Roundabout
Sight Vision	Sight distance will not be an issue
Geometrics	610' from I-75 bridge to Roundabout. Driving NB, proposed road super-elevation cross slope is the opposite of the existing bridge cross slope. The flat area for the roundabout will help smooth this transition.
Traffic Flow	Roundabout will keep traffic flowing during peak traffic periods
Safety	Roundabouts reduce severity of crashes
Flood Plain	15141 CYD (fill)
Wetlands	4.65 acres (impacts will require mitigation)
Parcels	11 parcels impacted (7 excluding Genesys and CE)
Cultural	None Anticipated
Miscellaneous	Would require less earthwork than Option 1 – Terminal
	Option impacts vacant field instead of residential (historic) property

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Flint, MI 48502
O: (810) 341-7500
F: (810) 341-7573
www.rowepsc.com

DORT HIGHWAY ALTERNATES

DATE: 5-25-16

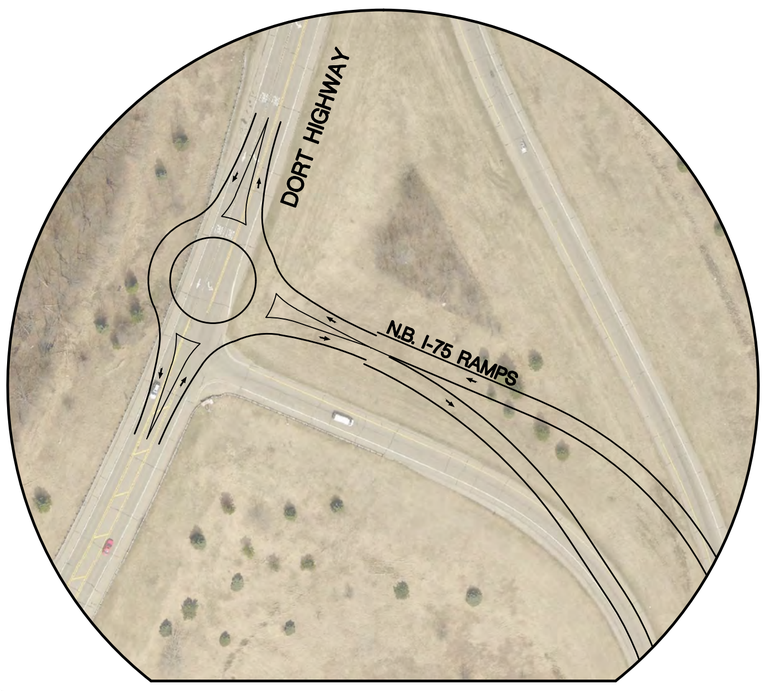
Legend

- Proposed Right of Way
- Parcel Line
- Wetland Boundary
- Floodplain

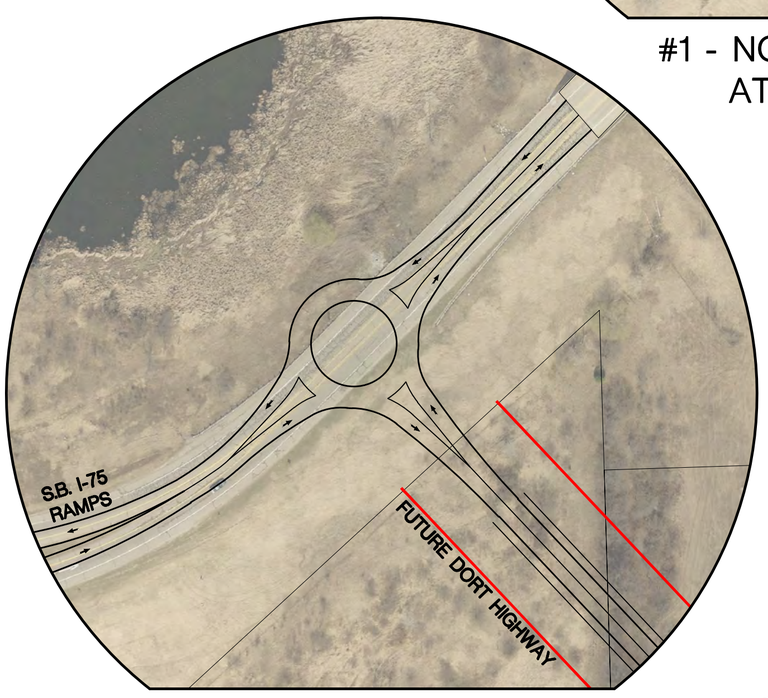
0 300 600

1 inch = 300 ft.

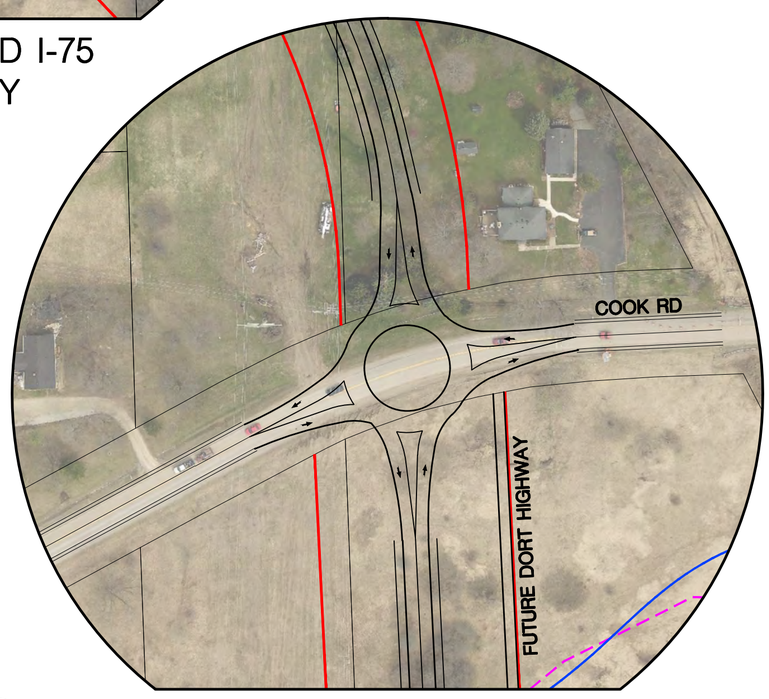
N W E S



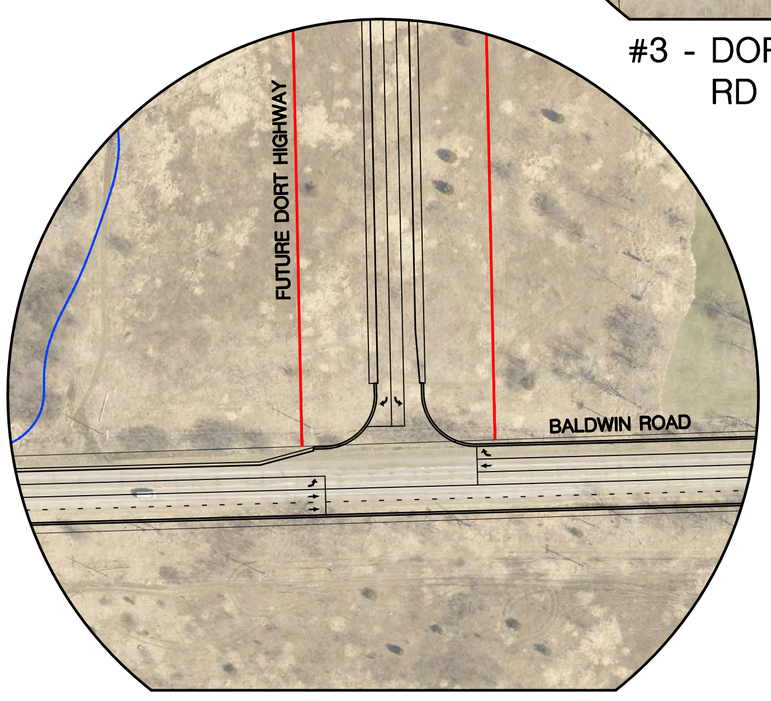
#1 - NORTHBOUND I-75 AT DORT HWY
SCALE: 1"=100'



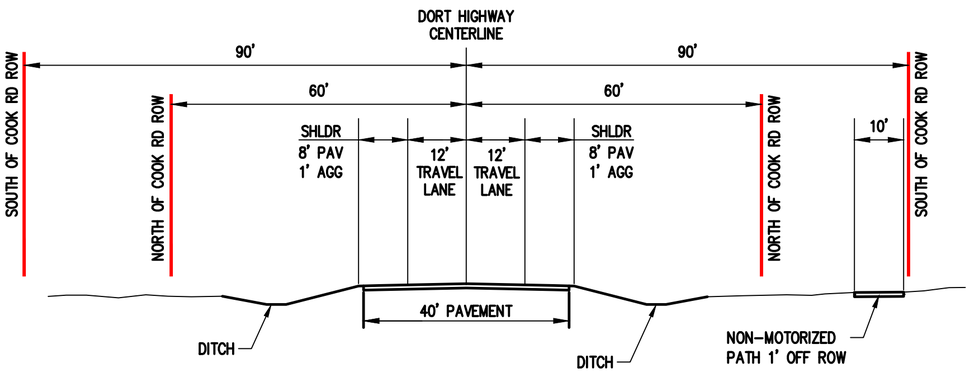
#2 - SOUTHBOUND I-75 AT DORT HWY
SCALE: 1"=100'



#3 - DORT HWY AND COOK RD INTERSECTION
SCALE: 1"=100'



#4 - DORT HWY AND BALDWIN RD INTERSECTION
SCALE: 1"=100'

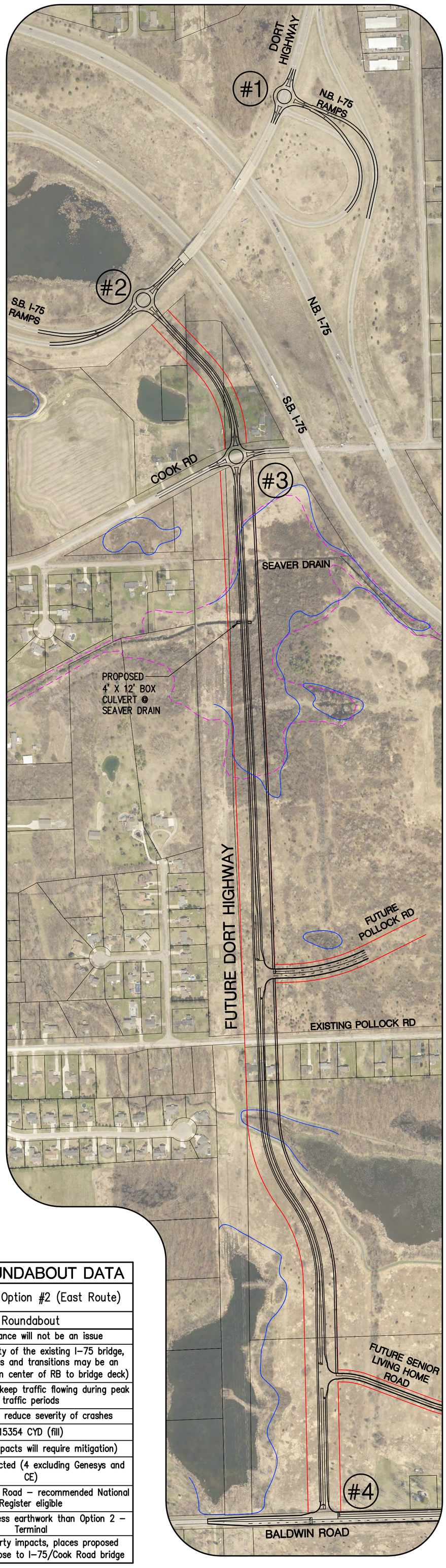


DORT HIGHWAY CROSS SECTION
NOT TO SCALE

OPTION #2 ROUNDABOUT

Description:

DORT HIGHWAY - BALDWIN RD TO I-75, 2 LANES WITH ROUNDABOUT AT COOK ROAD AND ROUNDABOUTS AT SB I-75 RAMPS AND NB I-75 RAMPS AND DORT HIGHWAY.



OPTION #2 - ROUNDABOUT DATA	
Criteria Element	Connection Option #2 (East Route)
	Roundabout
Sight Vision	Sight distance will not be an issue
Geometrics	Due to proximity of the existing I-75 bridge, roadway slopes and transitions may be an issue. (300' from center of RB to bridge deck)
Traffic Flow	Roundabout will keep traffic flowing during peak traffic periods
Safety	Roundabouts reduce severity of crashes
Flood Plain	15354 CYD (fill)
Wetlands	6.2 acres (impacts will require mitigation)
Parcels	8 parcels impacted (4 excluding Genesys and CE)
Cultural	3035 East Cook Road – recommended National Register eligible
Miscellaneous	Would require less earthwork than Option 2 – Terminal
	Historic property impacts, places proposed roadway too close to I-75/Cook Road bridge

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www.rowepsc.com

DORT HIGHWAY ALTERNATES

DATE: 5-25-16

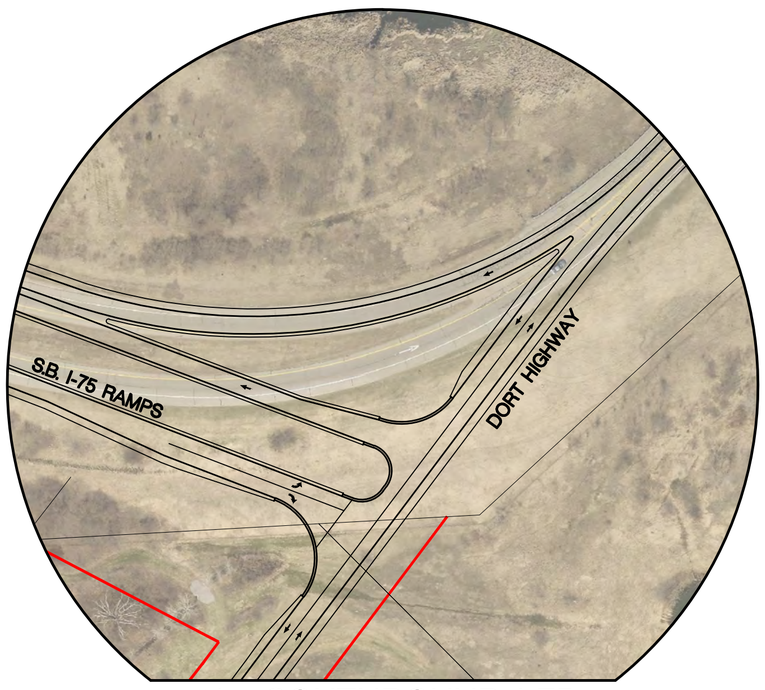
Legend

- Proposed Right of Way
- Parcel Line
- Wetland Boundary
- Floodplain

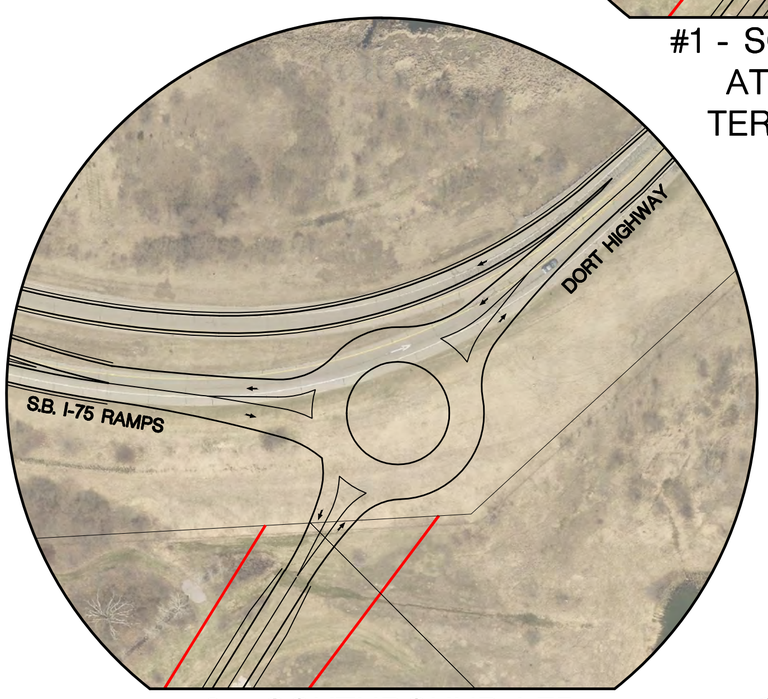
0 300 600

1 inch = 300 ft.

N W E S



#1 - SOUTHBOUND I-75 AT DORT HWY - TERMINAL OPTION
SCALE: 1"=100'



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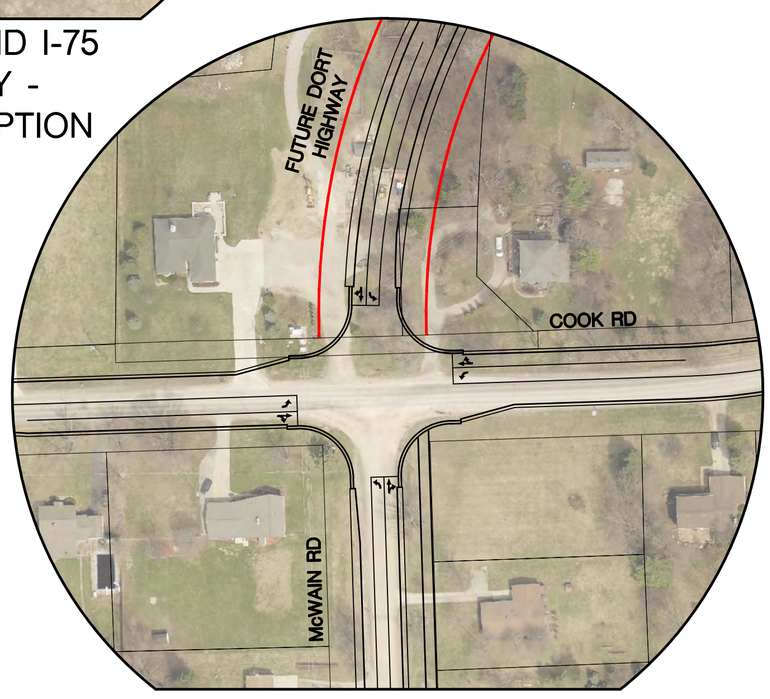

#3 - DORT HIGHWAY / McWAIN RD AND COOK RD INTERSECTION
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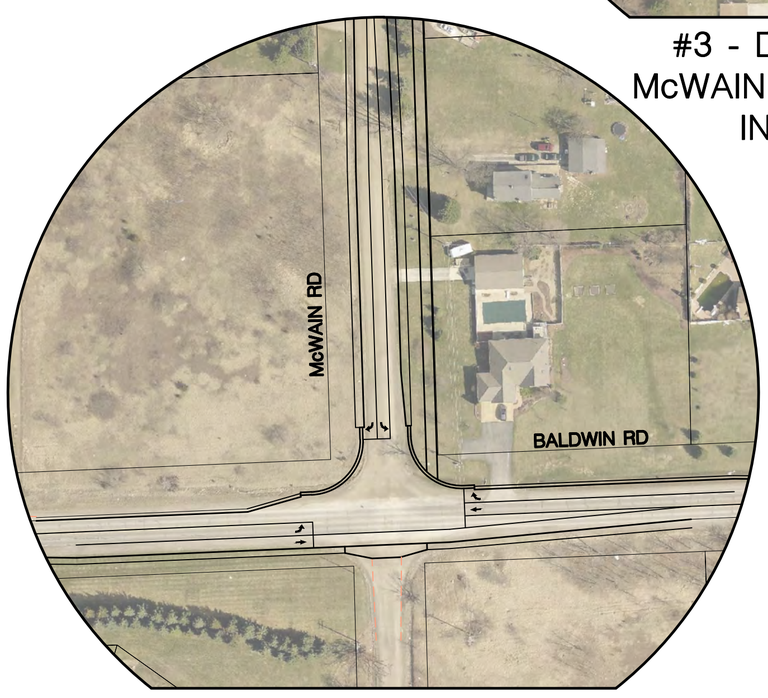
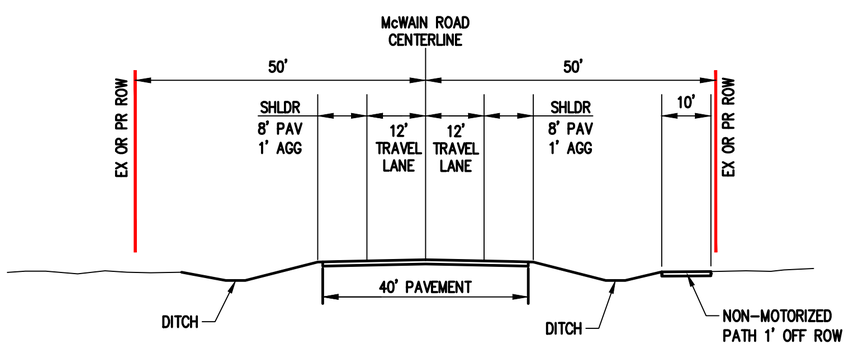


#4 - McWAIN RD AND BALDWIN RD INTERSECTION
SCALE: 1"=100'

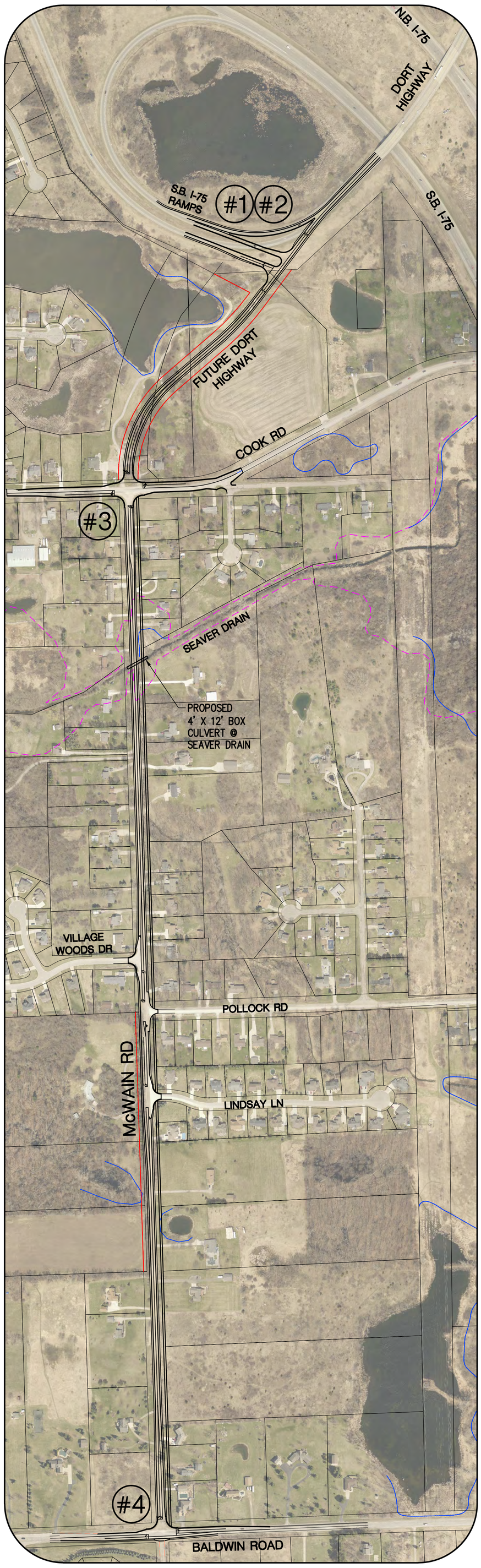


McWAIN ROAD CROSS SECTION
NOT TO SCALE

McWAIN ROAD OPTION

Description:

McWAIN ROAD – BALDWIN RD TO I-75, 2 LANES WITH A STANDARD INTERSECTION AT COOK ROAD AND TERMINAL CONNECTORS OR ROUNDABOUTS AT I-75/DORT CONNECTIONS.



McWAIN OPTION	
Criteria Element	Connection Option McWain Rd Terminal or Roundabout
Flood Plain	807 CYD (fill)
Wetlands	0.43 acres
Parcels	60 parcels impacted

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Appendix B

Standard Environmental Record Database Report

Dort Highway
Dort Highway
Grand Blanc, MI 48439

Inquiry Number: 4638585.1s
June 06, 2016

The EDR Radius Map™ Report

Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

DORT HIGHWAY
GRAND BLANC, MI 48439

COORDINATES

Latitude (North):	42.9057690 - 42° 54' 20.76''
Longitude (West):	83.6494540 - 83° 38' 58.03''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	283705.8
UTM Y (Meters):	4753541.5
Elevation:	858 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	6066276 FLINT SOUTH, MI
Version Date:	2014
Northeast Map:	6066278 GOODRICH, MI
Version Date:	2014
Southeast Map:	6066260 DAVISBURG, MI
Version Date:	2014
South Map:	6066270 FENTON, MI
Version Date:	2014

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140722
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
DORT HIGHWAY
GRAND BLANC, MI 48439

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	COVINGRON GROUP INC	7500 DORT HWY	MI WDS	Lower	117, 0.022, West
A2	COVINGRON GROUP INC	7500 DORT HWY	RCRA NonGen / NLR, FINDS, ECHO	Lower	117, 0.022, West
B3	GRAND CASTLE MART	3041 E GRAND BLANC R	RCRA NonGen / NLR	Lower	193, 0.037, North
B4	CASTLE PLAZA	3041 E GRAND BLANC R	MI UST	Lower	193, 0.037, North
B5		3041 E GRAND BLANC R	EDR Hist Auto	Lower	193, 0.037, North
B6	GRAND CASTLE MART	3041 E GRAND BLANC R	FINDS, ECHO	Lower	193, 0.037, North
B7	GRAND CASTLE MART	3041 E GRAND BLANC R	MI WDS	Lower	193, 0.037, North
C8	GRAND BLANC II	8166 EMBURY ROAD	FINDS, ECHO	Lower	311, 0.059, NNE
D9	US 23 AUTOCARE & TOW	GREEN VALLEY RD & GR	FINDS, ECHO	Lower	427, 0.081, NNW
D10	US 23 AUTOCARE & TOW	GREEN VALLEY RD & GR	RCRA NonGen / NLR	Lower	427, 0.081, NNW
D11	US 23 AUTOCARE & TOW	GREEN VALLEY RD & GR	MI WDS	Lower	427, 0.081, NNW
C12	BARRON PRECISION INS	8170 EMBURY RD	FINDS, ECHO	Lower	591, 0.112, NNE
C13	BARRON PRECISION INS	8170 EMBURY RD	RCRA-SQG	Lower	591, 0.112, NNE
C14	BARRON PRECISION INS	8170 EMBURY RD	MI WDS	Lower	591, 0.112, NNE
E15	CHIPPEWA MANAGEMENT	8018 EMBURY	FINDS, ECHO	Lower	598, 0.113, NNE
E16	CHIPPEWA MANAGEMENT	8018 EMBURY	RCRA-CESQG	Lower	598, 0.113, NNE
E17	CHIPPEWA MANAGEMENT	8018 EMBURY	MI WDS	Lower	598, 0.113, NNE
C18	LOON LAKE PRECISION	8200 EMBURY RD	MI WDS	Higher	602, 0.114, NNE
F19	MIDWEST POOLS INC	3090 W COOK RD	FINDS, ECHO	Lower	610, 0.116, SE
F20	LEADING EDGE FIBERGL	3090 W COOK ROAD	MI AIRS, MI WDS	Lower	610, 0.116, SE
F21	MIDWEST POOLS INC	3090 W COOK RD	RCRA-CESQG	Lower	610, 0.116, SE
F22	LEADING EDGE FIBERGL	3090 W COOK RD	US AIRS, FINDS, ECHO	Lower	610, 0.116, SE
G23	BULLET ENGINEERING L	8242 EMBURY RD	FINDS, ECHO	Higher	620, 0.117, NE
G24	BULLET ENGINEERING L	8242 EMBURY RD	MI WDS	Higher	620, 0.117, NE
G25	BULLET ENGINEERING L	8242 EMBURY RD	RCRA NonGen / NLR	Higher	620, 0.117, NE
G26	PREMIER TOOLING	8260 EMBURY RD	MI WDS	Higher	625, 0.118, NE
D27	US 23 MARATHON	2456 GRAND BLANC RD	MI AST	Lower	892, 0.169, NNW
H28		8009 DUNGARVIN	MI SPILLS	Lower	1218, 0.231, NNW
H29		8009 DUNGARVIN DRIVE	ERNS	Lower	1218, 0.231, NNW
H30		8009 DUNGARVIN DRIVE	MI SPILLS	Lower	1218, 0.231, NNW
H31		8009 DUNGARVIN DRIVE	ERNS	Lower	1218, 0.231, NNW
I32	THE UNIVERSITY OF MI	3181 E GRAND BLANC R	RCRA-CESQG	Lower	1283, 0.243, NNE
I33	THE UNIVERSITY OF MI	3181 E GRAND BLANC R	MI WDS	Lower	1283, 0.243, NNE
J34	BONNIE PERRY RESIDEN	3199 HOSPERS ST	MI WDS	Lower	1779, 0.337, NNE
J35	BONNIE PERRY RESIDEN	3199 HOSPERS ST	FINDS, ECHO	Lower	1779, 0.337, NNE
J36	BONNIE PERRY RESIDEN	3199 HOSPERS ST	RCRA-CESQG	Lower	1779, 0.337, NNE
37	EDWARD MAGNER	2356 E COOK RD	MI WDS	Lower	1998, 0.378, SW
K38	GENESYS REGIONAL MED	1 GENESYS PARKWAY	RCRA-SQG, FINDS, RI MANIFEST, ECHO	Higher	2007, 0.380, SSE
K39	GENESYS REGIONAL MED	1 GENESYS PARKWAY	MI WDS	Higher	2007, 0.380, SSE

MAPPED SITES SUMMARY

Target Property Address:
DORT HIGHWAY
GRAND BLANC, MI 48439

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
K40	GENESYS REGIONAL MED	1 GENESYS PKWY	MI AST	Higher	2007, 0.380, SSE
K41	GENESYS REGIONAL MED	ONE GENESYS PARKWAY	US AIRS	Higher	2037, 0.386, SSE
L42	LBC PROPERTIES INVES	2330 GRAND BLANC RD	MI AST	Lower	2165, 0.410, NW
L43	GRAND BLANC ROAD BUS	2330 GRAND BLANC BLV	FINDS, ECHO	Lower	2228, 0.422, NW
44	GENESYS DIAGNOSTICS	600 HEALTHPARK BLVD,	MLTS	Higher	2585, 0.490, SSE
45		2190 LAKE RIDGE DR	EDR Hist Auto	Lower	3130, 0.593, West
M46	RAPID DESIGN SVC INC	3089 TRI PARK DR	RCRA-CESQG, FINDS, ECHO	Lower	3363, 0.637, North
M47	SELMURO LTD	3111 TRI PARK DR	RCRA-CESQG, FINDS, ECHO	Lower	3421, 0.648, North
48	MAC ARTHUR CORPORATI	3190 TRI PARK DR	RCRA-CESQG	Lower	3469, 0.657, North
N49	AUTO CITY SERVICE	3465 POLLOCK RD	MI LUST, MI INVENTORY	Higher	3936, 0.745, SE
N50	HOLLY ROAD BP	9291 HOLLY RD	MI LUST, MI UST, MI WDS	Higher	4358, 0.825, SE
51	BUS GARAGE JEWETT TR	JEWITT TRAIL	MI LUST, MI UST, MI INVENTORY	Lower	4399, 0.833, NE
52	HOLLY 75	9311 HOLLY RD	MI LUST, MI UST, MI WDS	Higher	4454, 0.844, SE
O53	HOLLY HILLS SUNOCO	9118 HOLLY RD	MI LUST, MI UST, MI INVENTORY, MI WDS	Higher	4666, 0.884, ESE
O54	HOLLY HILLS SUNOCO	9118 HOLLY ROAD	MI INVENTORY	Higher	4666, 0.884, ESE
55	DEPT OF PUBLIC WORKS	507 E GRAND BLANC RD	MI LUST, MI UST, MI WDS	Lower	4997, 0.946, NNE
56	ROSS PROPERTIES	G-6434 S DORT HWY	MI LUST, MI UST	Lower	5026, 0.952, North
57	MOTORS LIQUIDATION C	10800 S SAGINAW ST	CORRACTS, MI LUST, MI UST, MI INVENTORY, RCRA...	Lower	7512, 1.423, NNE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

State- and tribal - equivalent CERCLIS

MI SHWS ---------- This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

EXECUTIVE SUMMARY

State and tribal landfill and/or solid waste disposal site lists

MI SWF/LF ---------- Solid Waste Facilities Database

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

MI AUL ---------- Engineering and Institutional Controls

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

MI BROWNFIELDS ---------- Brownfields and UST Site Database

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

MI HIST LF ---------- Inactive Solid Waste Facilities
MI SWRCY ---------- Recycling Facilities
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
ODI ---------- Open Dump Inventory
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register
MI PART 201 ---------- Part 201 Site List
MI CDL ---------- Clandestine Drug Lab Listing
MI DEL PART 201 ---------- Delisted List of Contaminated Sites
US CDL ---------- National Clandestine Laboratory Register

Local Land Records

MI LIENS ---------- Lien List
LIENS 2 ---------- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System

Other Ascertainable Records

FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US MINES	Mines Master Index File
DOCKET HWC	Hazardous Waste Compliance Docket Listing
UXO	Unexploded Ordnance Sites
MI BEA	Baseline Environmental Assessment Database
MI COAL ASH	Coal Ash Disposal Sites
MI DRYCLEANERS	Drycleaning Establishments
MI Financial Assurance	Financial Assurance Information Listing
MI LEAD	Lead Safe Housing Registry
MI NPDES	List of Active NPDES Permits
MI UIC	Underground Injection Wells Database
FUELS PROGRAM	EPA Fuels Program Registered Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR Hist Cleaner	EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

MI RGA PART 201	Recovered Government Archive State Hazardous Waste Facilities List

EXECUTIVE SUMMARY

MI RGA LF ..... Recovered Government Archive Solid Waste Facilities List
MI RGA LUST ..... Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA CORRACTS facilities list

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 12/09/2015 has revealed that there is 1 CORRACTS site within approximately 1.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MOTORS LIQUIDATION C	***10800 S SAGINAW ST***	***NNE 1 - 2 (1.423 mi.)***	***57***	***66***

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 12/09/2015 has revealed that there are 2 RCRA-SQG sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GENESYS REGIONAL MED	***1 GENESYS PARKWAY***	***SSE 1/4 - 1/2 (0.380 mi.)***	***K38***	***38***

Lower Elevation	Address	Direction / Distance	Map ID	Page
BARRON PRECISION INS	8170 EMBURY RD	NNE 0 - 1/8 (0.112 mi.)	C13	16

EXECUTIVE SUMMARY

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 12/09/2015 has revealed that there are 7 RCRA-CESQG sites within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CHIPPEWA MANAGEMENT	8018 EMBURY	NNE 0 - 1/8 (0.113 mi.)	E16	19
MIDWEST POOLS INC	3090 W COOK RD	SE 0 - 1/8 (0.116 mi.)	F21	24
THE UNIVERSITY OF MI	3181 E GRAND BLANC R	NNE 1/8 - 1/4 (0.243 mi.)	I32	34
BONNIE PERRY RESIDEN	3199 HOSPERS ST	NNE 1/4 - 1/2 (0.337 mi.)	J36	36
RAPID DESIGN SVC INC	***3089 TRI PARK DR***	***N 1/2 - 1 (0.637 mi.)***	***M46***	***46***
SELMURO LTD	***3111 TRI PARK DR***	***N 1/2 - 1 (0.648 mi.)***	***M47***	***47***
MAC ARTHUR CORPORATI	3190 TRI PARK DR	N 1/2 - 1 (0.657 mi.)	48	50

Federal ERNS list

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 03/28/2016 has revealed that there are 2 ERNS sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	8009 DUNGARVIN DRIVE	NNW 1/8 - 1/4 (0.231 mi.)	H29	33
Not reported	8009 DUNGARVIN DRIVE	NNW 1/8 - 1/4 (0.231 mi.)	H31	34

State and tribal leaking storage tank lists

MI LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Quality's Leaking Underground Storage Tank (LUST) Database.

A review of the MI LUST list, as provided by EDR, and dated 02/01/2016 has revealed that there are 7 MI LUST sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AUTO CITY SERVICE Release Status: Open Substance Release: Unknown Facility Id: 00041176	***3465 POLLOCK RD***	***SE 1/2 - 1 (0.745 mi.)***	***N49***	***52***
HOLLY ROAD BP Release Status: Closed Facility Id: 00005661	***9291 HOLLY RD***	***SE 1/2 - 1 (0.825 mi.)***	***N50***	***52***
HOLLY 75	***9311 HOLLY RD***	***SE 1/2 - 1 (0.844 mi.)***	***52***	***58***

Release Status: Closed
Facility Id: 00020018

HOLLY HILLS SUNOCO	***9118 HOLLY RD***	***ESE 1/2 - 1 (0.884 mi.)***	***O53***	***59***
Release Status: Open Facility Id: 00018952				

Lower Elevation	Address	Direction / Distance	Map ID	Page
BUS GARAGE JEWETT TR	***JEWITT TRAIL***	***NE 1/2 - 1 (0.833 mi.)***	***51***	***55***
Release Status: Open Release Status: Closed Substance Release: Diesel,Diesel Substance Release: Gasoline Facility Id: 00001176				
DEPT OF PUBLIC WORKS	***507 E GRAND BLANC RD***	***NNE 1/2 - 1 (0.946 mi.)***	***55***	***63***
Release Status: Closed Substance Release: Gasoline Substance Release: Diesel Substance Release: Used Oil Facility Id: 00014803				
ROSS PROPERTIES	***G-6434 S DORT HWY***	***N 1/2 - 1 (0.952 mi.)***	***56***	***65***
Release Status: Closed Substance Release: Unknown Facility Id: 00041962				

State and tribal registered storage tank lists

MI UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Quality's Michigan UST database.

A review of the MI UST list, as provided by EDR, and dated 11/03/2015 has revealed that there is 1 MI UST site within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CASTLE PLAZA Tank Status: Currently In Use Facility Type: ACTIVE Facility Id: 00039300	3041 E GRAND BLANC R	N 0 - 1/8 (0.037 mi.)	B4	11

MI AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the Department of Natural Resources' Michigan AST database.

A review of the MI AST list, as provided by EDR, and dated 03/09/2016 has revealed that there are 3 MI AST sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GENESYS REGIONAL MED Facility Id: 91025137	1 GENESYS PKWY	SSE 1/4 - 1/2 (0.380 mi.)	K40	42

List Status: ACTIVE
Tank Status: Currently In Use

Lower Elevation	Address	Direction / Distance	Map ID	Page
US 23 MARATHON Facility Id: 92025075 List Status: CLOSED Removed/Closed Date: 05/05/1998 Tank Status: Removed from Premises	2456 GRAND BLANC RD	NNW 1/8 - 1/4 (0.169 mi.)	D27	31
LBC PROPERTIES INVES Facility Id: 92085133 List Status: CLOSED Removed/Closed Date: 10/30/2009 Tank Status: Removed from Premises	2330 GRAND BLANC RD	NW 1/4 - 1/2 (0.410 mi.)	L42	44

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

MI INVENTORY: The Inventory of Facilities has three data sources: Facilities under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) identified through state funded or private party response activities (Projects); Facilities under Part 213, Leaking Underground Storage Tanks of the NREPA; and Facilities identified through submittals of Baseline Environmental Assessments (BEA) submitted pursuant to Part 201 or Part 213 of the NREPA. The Part 201 Projects Inventory does not include all of the facilities that are subject to regulation under Part 201 because owners are not required to inform the Department of Environmental Quality (DEQ) about the facilities and can pursue cleanup independently. Facilities that are not known to DEQ are not on the Inventory, nor are locations with releases that resulted in low environmental impact. Part 213 facilities listed here may have more than one release; a list of releases for which corrective actions have been completed and list of releases for which corrective action has not been completed is located on the Leaking Underground Storage Tanks Site Search webpage. The DEQ may or may not have reviewed and concurred with the conclusion that the corrective actions described in a closure report meets criteria. A BEA is a document that new or prospective property owners/operations disclose to the DEQ identifying the property as a facility pursuant to Part 201 and Part 213. The Inventory of BEA Facilities overlaps in part with the Part 201 Projects facilities and Part 213 facilities. There may be more than one BEA for each facility.

A review of the MI INVENTORY list, as provided by EDR, and dated 01/25/2016 has revealed that there are 4 MI INVENTORY sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AUTO CITY SERVICE Facility ID: 00041176	***3465 POLLOCK RD***	***SE 1/2 - 1 (0.745 mi.)***	***N49***	***52***
HOLLY HILLS SUNOCO Facility ID: 00018952	***9118 HOLLY RD***	***ESE 1/2 - 1 (0.884 mi.)***	***O53***	***59***
HOLLY HILLS SUNOCO Facility ID: 25000125	9118 HOLLY ROAD	ESE 1/2 - 1 (0.884 mi.)	O54	63

Lower Elevation	Address	Direction / Distance	Map ID	Page
BUS GARAGE JEWETT TR	***JEWITT TRAIL***	***NE 1/2 - 1 (0.833 mi.)***	***51***	***55***

EXECUTIVE SUMMARY

Facility ID: 00001176

Records of Emergency Release Reports

MI SPILLS: Environmental pollution emergencies reported to the Department of Environmental Quality such as tanker accidents, pipeline breaks, and release of reportable quantities of hazardous substances.

A review of the MI SPILLS list, as provided by EDR, and dated 02/29/2016 has revealed that there are 2 MI SPILLS sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	8009 DUNGARVIN	NNW 1/8 - 1/4 (0.231 mi.)	H28	32
Not reported	8009 DUNGARVIN DRIVE	NNW 1/8 - 1/4 (0.231 mi.)	H30	33

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/09/2015 has revealed that there are 4 RCRA NonGen / NLR sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BULLET ENGINEERING L	8242 EMBURY RD	NE 0 - 1/8 (0.117 mi.)	G25	30

Lower Elevation	Address	Direction / Distance	Map ID	Page
COVINGRON GROUP INC	***7500 DORT HWY***	***W 0 - 1/8 (0.022 mi.)***	***A2***	***8***
GRAND CASTLE MART	3041 E GRAND BLANC R	N 0 - 1/8 (0.037 mi.)	B3	9
US 23 AUTOCARE & TOW	GREEN VALLEY RD & GR	NNW 0 - 1/8 (0.081 mi.)	D10	14

MLTS: The Material Licensing Tracking System is maintained by the Nuclear Regulatory Commission and contains a list fo approximately 8,100 sites which possess or use radioactive materials and are subject to NRC licensing requirements.

A review of the MLTS list, as provided by EDR, and dated 03/07/2016 has revealed that there is 1 MLTS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GENESYS DIAGNOSTICS	600 HEALTHPARK BLVD,	SSE 1/4 - 1/2 (0.490 mi.)	44	45

EXECUTIVE SUMMARY

US AIRS: The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

A review of the US AIRS list, as provided by EDR, and dated 10/20/2015 has revealed that there are 2 US AIRS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GENESYS REGIONAL MED	ONE GENESYS PARKWAY	SSE 1/4 - 1/2 (0.386 mi.)	K41	43

Lower Elevation	Address	Direction / Distance	Map ID	Page
LEADING EDGE FIBERGL	***3090 W COOK RD***	***SE 0 - 1/8 (0.116 mi.)***	***F22***	***25***

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 07/20/2015 has revealed that there are 12 FINDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BULLET ENGINEERING L	***8242 EMBURY RD***	***NE 0 - 1/8 (0.117 mi.)***	***G23***	***29***
GENESYS REGIONAL MED	***1 GENESYS PARKWAY***	***SSE 1/4 - 1/2 (0.380 mi.)***	***K38***	***38***

Lower Elevation	Address	Direction / Distance	Map ID	Page
COVINGRON GROUP INC	***7500 DORT HWY***	***W 0 - 1/8 (0.022 mi.)***	***A2***	***8***
GRAND CASTLE MART	***3041 E GRAND BLANC R***	***N 0 - 1/8 (0.037 mi.)***	***B6***	***13***
GRAND BLANC II	***8166 EMBURY ROAD***	***NNE 0 - 1/8 (0.059 mi.)***	***C8***	***13***
US 23 AUTOCARE & TOW	***GREEN VALLEY RD & GR***	***NNW 0 - 1/8 (0.081 mi.)***	***D9***	***14***
BARRON PRECISION INS	***8170 EMBURY RD***	***NNE 0 - 1/8 (0.112 mi.)***	***C12***	***16***
CHIPPEWA MANAGEMENT	***8018 EMBURY***	***NNE 0 - 1/8 (0.113 mi.)***	***E15***	***19***
MIDWEST POOLS INC	***3090 W COOK RD***	***SE 0 - 1/8 (0.116 mi.)***	***F19***	***22***
LEADING EDGE FIBERGL	***3090 W COOK RD***	***SE 0 - 1/8 (0.116 mi.)***	***F22***	***25***
BONNIE PERRY RESIDEN	***3199 HOSPERS ST***	***NNE 1/4 - 1/2 (0.337 mi.)***	***J35***	***36***
GRAND BLANC ROAD BUS	***2330 GRAND BLANC BLV***	***NW 1/4 - 1/2 (0.422 mi.)***	***L43***	***44***

MI AIRS: Permit and emissions inventory data.

A review of the MI AIRS list, as provided by EDR, and dated 03/23/2016 has revealed that there is 1 MI AIRS site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
LEADING EDGE FIBERGL	***3090 W COOK ROAD***	***SE 0 - 1/8 (0.116 mi.)***	***F20***	***23***

EXECUTIVE SUMMARY

State Registration Id: N7982

MI WDS: The Waste Data System (WDS) tracks activities at facilities regulated by the Solid Waste, Scrap Tire, Hazardous Waste, and Liquid Industrial Waste programs.

A review of the MI WDS list, as provided by EDR, and dated 02/26/2016 has revealed that there are 13 MI WDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LOON LAKE PRECISION WMD Id: 427103 Site Id: MIG000056822	8200 EMBURY RD	NNE 0 - 1/8 (0.114 mi.)	C18	22
BULLET ENGINEERING L WMD Id: 489923 Site Id: MIK880347753	8242 EMBURY RD	NE 0 - 1/8 (0.117 mi.)	G24	29
PREMIER TOOLING WMD Id: 438750 Site Id: MIG000048842	8260 EMBURY RD	NE 0 - 1/8 (0.118 mi.)	G26	31
GENESYS REGIONAL MED WMD Id: 411384 Site Id: MIR000022095	1 GENESYS PARKWAY	SSE 1/4 - 1/2 (0.380 mi.)	K39	42

Lower Elevation	Address	Direction / Distance	Map ID	Page
COVINGRON GROUP INC WMD Id: 494419 Site Id: MIK203211230	7500 DORT HWY	W 0 - 1/8 (0.022 mi.)	A1	8
GRAND CASTLE MART WMD Id: 476299 Site Id: MIK982398927	3041 E GRAND BLANC R	N 0 - 1/8 (0.037 mi.)	B7	13
US 23 AUTOCARE & TOW WMD Id: 490312 Site Id: MIK166695989	GREEN VALLEY RD & GR	NNW 0 - 1/8 (0.081 mi.)	D11	16
BARRON PRECISION INS WMD Id: 439815 Site Id: MIK742177280	8170 EMBURY RD	NNE 0 - 1/8 (0.112 mi.)	C14	18
CHIPPEWA MANAGEMENT WMD Id: 438724 Site Id: MIK676936198	8018 EMBURY	NNE 0 - 1/8 (0.113 mi.)	E17	22
LEADING EDGE FIBERGL WMD Id: 493768 Site Id: MIK838648332	***3090 W COOK ROAD***	***SE 0 - 1/8 (0.116 mi.)***	***F20***	***23***
THE UNIVERSITY OF MI WMD Id: 495533 Site Id: MIK355085485	3181 E GRAND BLANC R	NNE 1/8 - 1/4 (0.243 mi.)	I33	35
BONNIE PERRY RESIDEN WMD Id: 464421 Site Id: MIK146968854	3199 HOSPERS ST	NNE 1/4 - 1/2 (0.337 mi.)	J34	36
EDWARD MAGNER	2356 E COOK RD	SW 1/4 - 1/2 (0.378 mi.)	37	38

EXECUTIVE SUMMARY

WMD Id: 445035
Site Id: MIG000036272

ECHO: ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

A review of the ECHO list, as provided by EDR, and dated 09/20/2015 has revealed that there are 12 ECHO sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BULLET ENGINEERING L	*8242 EMBURY RD*	*NE 0 - 1/8 (0.117 mi.)*	*G23*	*29*
GENESYS REGIONAL MED	*1 GENESYS PARKWAY*	*SSE 1/4 - 1/2 (0.380 mi.)*	*K38*	*38*

Lower Elevation	Address	Direction / Distance	Map ID	Page
COVINGRON GROUP INC	*7500 DORT HWY*	*W 0 - 1/8 (0.022 mi.)*	*A2*	*8*
GRAND CASTLE MART	*3041 E GRAND BLANC R*	*N 0 - 1/8 (0.037 mi.)*	*B6*	*13*
GRAND BLANC II	*8166 EMBURY ROAD*	*NNE 0 - 1/8 (0.059 mi.)*	*C8*	*13*
US 23 AUTOCARE & TOW	*GREEN VALLEY RD & GR*	*NNW 0 - 1/8 (0.081 mi.)*	*D9*	*14*
BARRON PRECISION INS	*8170 EMBURY RD*	*NNE 0 - 1/8 (0.112 mi.)*	*C12*	*16*
CHIPPEWA MANAGEMENT	*8018 EMBURY*	*NNE 0 - 1/8 (0.113 mi.)*	*E15*	*19*
MIDWEST POOLS INC	*3090 W COOK RD*	*SE 0 - 1/8 (0.116 mi.)*	*F19*	*22*
LEADING EDGE FIBERGL	*3090 W COOK RD*	*SE 0 - 1/8 (0.116 mi.)*	*F22*	*25*
BONNIE PERRY RESIDEN	*3199 HOSPERS ST*	*NNE 1/4 - 1/2 (0.337 mi.)*	*J35*	*36*
GRAND BLANC ROAD BUS	*2330 GRAND BLANC BLV*	*NW 1/4 - 1/2 (0.422 mi.)*	*L43*	*44*

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there are 2 EDR Hist Auto sites within approximately 0.625 miles of the target property.

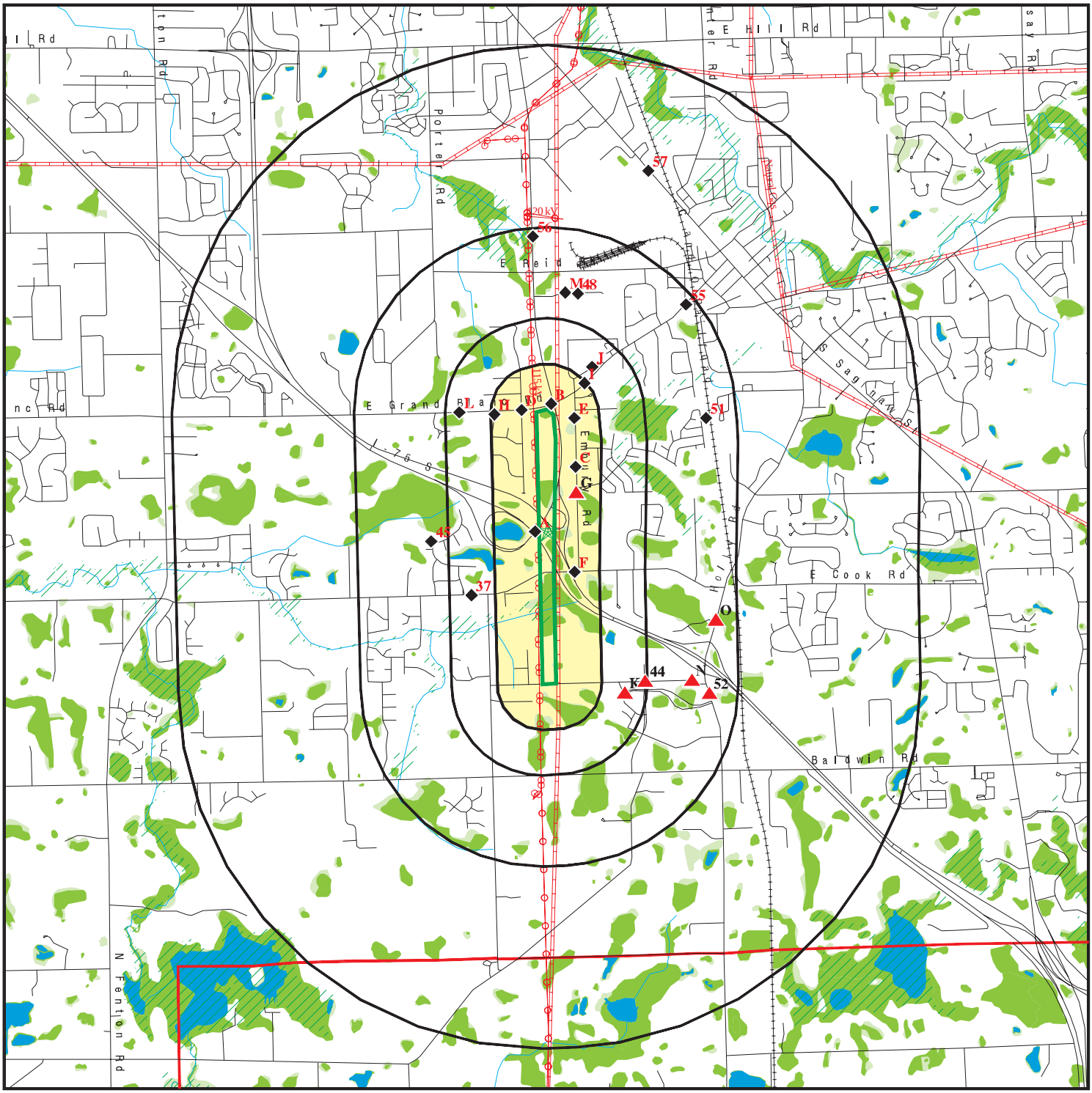
Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	3041 E GRAND BLANC R	N 0 - 1/8 (0.037 mi.)	B5	12
Not reported	2190 LAKE RIDGE DR	W 1/2 - 1 (0.593 mi.)	45	45

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 35 records.

Site Name	Database(s)
G-5107 NORTH DORT HIGHWAY	MI INVENTORY
3701 AND 3751 S. DORT HWY	MI INVENTORY
4315 & 4349 S. DORT HIGHWAY	MI INVENTORY
3701 AND 3751 S. DORT HIGHWAY	MI INVENTORY
1512 AND 1514 S. DORT HWY.	MI INVENTORY
4057 AND 4085 SOUTH DORT HIGHWAY	MI INVENTORY
5130 AND 5122 NORTH DORT HIGHWAY	MI INVENTORY
2.7 ACRES NE CORNER N. DORT HWY/DA	MI INVENTORY
0.619 ACRES NE CORNER OF N.DORT HW	MI INVENTORY
2010 NORTH DORT HWY, PARCEL B	MI INVENTORY
1419 N. DORT HWY.	MI INVENTORY
902 SOUTH DORT HIGHWAY	MI INVENTORY
810 SOUTH DORT HIGHWAY	MI INVENTORY
2060 S. DORT HWY.	MI INVENTORY
2525 SOUTH DORT HIGHWAY	MI INVENTORY
10098 NORTH DORT HIGHWAY	MI INVENTORY
G-5150 DORT HIGHWAY	MI INVENTORY
5167 NORTH DORT HIGHWAY	MI INVENTORY
7365 N. DORT HIGHWAY	MI INVENTORY
10092 NORTH DORT HIGHWAY	MI INVENTORY
1801 S. DORT HIGHWAY	MI INVENTORY
5443 S. DORT HWY.	MI INVENTORY
6312 NORTH DORT HIGHWAY	MI INVENTORY
2102 S. DORT HWY.	MI INVENTORY
3302 SOUTH DORT HIGHWAY	MI INVENTORY
3302 S. DORT HIGHWAY	MI INVENTORY
1733 N. DORT HIGHWAY	MI INVENTORY
4012 NORTH DORT HIGHWAY	MI INVENTORY
G-5135, G-5145 & G-5155 NORTH DORT	MI INVENTORY
G-5107 NORTH DORT HWY	MI INVENTORY
G-5395 NORTH DORT HIGHWAY	MI INVENTORY
G-8010 NORTH DORT HIGHWAY	MI INVENTORY
G-5107 NORTH DORT HWY.	MI INVENTORY
G-3509 SOUTH DORT HIGHWAY	MI INVENTORY
4057 AND 4085 SOUTH DORT HIGHWAY	MI BEA

OVERVIEW MAP - 4638585.1S



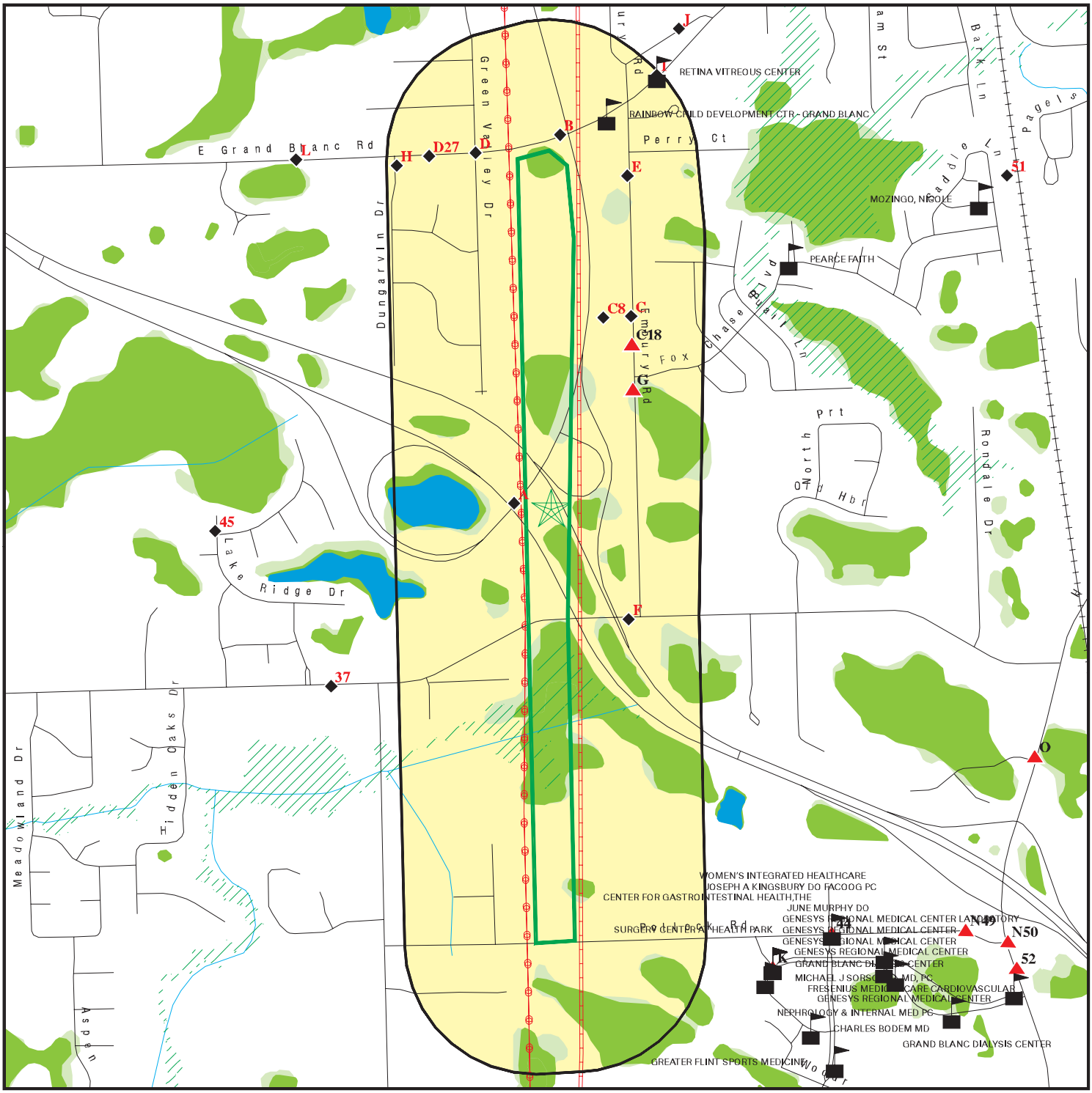
0 3/4 1 1/2 3 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Dort Highway	CLIENT: AKT Peerless Environmental Svc
ADDRESS: Dort Highway	CONTACT: Aaron Bigler
Grand Blanc MI 48439	INQUIRY #: 4638585.1s
LAT/LONG: 42.905769 / 83.649454	DATE: June 06, 2016 6:47 pm

DETAIL MAP - 4638585.1S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Dort Highway	CLIENT: AKT Peerless Environmental Svc
ADDRESS: Dort Highway Grand Blanc MI 48439	CONTACT: Aaron Bigler
LAT/LONG: 42.905769 / 83.649454	INQUIRY #: 4638585.1s DATE: June 06, 2016 6:49 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.500		0	0	0	0	0	0
Proposed NPL	1.500		0	0	0	0	0	0
NPL LIENS	0.500		0	0	0	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.500		0	0	0	0	0	0
Federal CERCLIS list								
FEDERAL FACILITY	1.000		0	0	0	0	NR	0
SEMS	1.000		0	0	0	0	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	1.000		0	0	0	0	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.500		0	0	0	0	1	1
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	1.000		0	0	0	0	NR	0
Federal RCRA generators list								
RCRA-LQG	0.750		0	0	0	0	NR	0
RCRA-SQG	0.750		1	0	1	0	NR	2
RCRA-CESQG	0.750		2	1	1	3	NR	7
Federal institutional controls / engineering controls registries								
LUCIS	1.000		0	0	0	0	NR	0
US ENG CONTROLS	1.000		0	0	0	0	NR	0
US INST CONTROL	1.000		0	0	0	0	NR	0
Federal ERNS list								
ERNS	0.500		0	2	0	NR	NR	2
State- and tribal - equivalent CERCLIS								
MI SHWS	1.500		0	0	0	0	0	0
State and tribal landfill and/or solid waste disposal site lists								
MI SWF/LF	1.000		0	0	0	0	NR	0
State and tribal leaking storage tank lists								
MI LUST	1.000		0	0	0	7	NR	7
INDIAN LUST	1.000		0	0	0	0	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.750		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MI UST	0.750		1	0	0	0	NR	1
MI AST	0.750		0	1	2	0	NR	3
INDIAN UST	0.750		0	0	0	0	NR	0
State and tribal institutional control / engineering control registries								
MI AUL	1.000		0	0	0	0	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	1.000		0	0	0	0	NR	0
State and tribal Brownfields sites								
MI BROWNFIELDS	1.000		0	0	0	0	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	1.000		0	0	0	0	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
MI HIST LF	1.000		0	0	0	0	NR	0
MI SWRCY	1.000		0	0	0	0	NR	0
INDIAN ODI	1.000		0	0	0	0	NR	0
ODI	1.000		0	0	0	0	NR	0
DEBRIS REGION 9	1.000		0	0	0	0	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.500		0	0	0	NR	NR	0
MI PART 201	1.500		0	0	0	0	0	0
MI INVENTORY	1.000		0	0	0	4	NR	4
MI CDL	0.500		0	0	0	NR	NR	0
MI DEL PART 201	1.500		0	0	0	0	0	0
US CDL	0.500		0	0	0	NR	NR	0
Local Land Records								
MI LIENS	0.500		0	0	0	NR	NR	0
LIENS 2	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.500		0	0	0	NR	NR	0
MI SPILLS	0.500		0	2	0	NR	NR	2
Other Ascertainable Records								
RCRA NonGen / NLR	0.750		4	0	0	0	NR	4
FUDS	1.500		0	0	0	0	0	0
DOD	1.500		0	0	0	0	0	0
SCRD DRYCLEANERS	1.000		0	0	0	0	NR	0
US FIN ASSUR	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EPA WATCH LIST	0.500		0	0	0	NR	NR	0
2020 COR ACTION	0.750		0	0	0	0	NR	0
TSCA	0.500		0	0	0	NR	NR	0
TRIS	0.500		0	0	0	NR	NR	0
SSTS	0.500		0	0	0	NR	NR	0
ROD	1.500		0	0	0	0	0	0
RMP	0.500		0	0	0	NR	NR	0
RAATS	0.500		0	0	0	NR	NR	0
PRP	0.500		0	0	0	NR	NR	0
PADS	0.500		0	0	0	NR	NR	0
ICIS	0.500		0	0	0	NR	NR	0
FTTS	0.500		0	0	0	NR	NR	0
MLTS	0.500		0	0	1	NR	NR	1
COAL ASH DOE	0.500		0	0	0	NR	NR	0
COAL ASH EPA	1.000		0	0	0	0	NR	0
PCB TRANSFORMER	0.500		0	0	0	NR	NR	0
RADINFO	0.500		0	0	0	NR	NR	0
HIST FTTS	0.500		0	0	0	NR	NR	0
DOT OPS	0.500		0	0	0	NR	NR	0
CONSENT	1.500		0	0	0	0	0	0
INDIAN RESERV	1.500		0	0	0	0	0	0
FUSRAP	1.500		0	0	0	0	0	0
UMTRA	1.000		0	0	0	0	NR	0
LEAD SMELTERS	0.500		0	0	0	NR	NR	0
US AIRS	0.500		1	0	1	NR	NR	2
US MINES	0.750		0	0	0	0	NR	0
FINDS	0.500		9	0	3	NR	NR	12
DOCKET HWC	0.500		0	0	0	NR	NR	0
UXO	1.500		0	0	0	0	0	0
MI AIRS	0.500		1	0	0	NR	NR	1
MI BEA	0.500		0	0	0	NR	NR	0
MI COAL ASH	1.000		0	0	0	0	NR	0
MI DRYCLEANERS	0.750		0	0	0	0	NR	0
MI Financial Assurance	0.500		0	0	0	NR	NR	0
MI LEAD	0.500		0	0	0	NR	NR	0
NY MANIFEST	0.250		0	0	NR	NR	NR	0
RI MANIFEST	0.250		0	0	NR	NR	NR	0
MI NPDES	0.500		0	0	0	NR	NR	0
MI UIC	0.500		0	0	0	NR	NR	0
MI WDS	0.500		9	1	3	NR	NR	13
FUELS PROGRAM	0.750		0	0	0	0	NR	0
ECHO	0.500		9	0	3	NR	NR	12

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.500		0	0	0	0	0	0
EDR Hist Auto	0.625		1	0	0	1	NR	2
EDR Hist Cleaner	0.625		0	0	0	0	NR	0

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

MI RGA PART 201	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MI RGA LF	0.500		0	0	0	NR	NR	0
MI RGA LUST	0.500		0	0	0	NR	NR	0
- Totals --		0	38	7	15	15	1	76

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **COVINGRON GROUP INC** **MI WDS** **S117854177**
West **7500 DORT HWY** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.022 mi.
117 ft. **Site 1 of 2 in cluster A**

Relative:
Lower

Actual:
852 ft.

WDS:

Site Id:	MIK203211230
WMD Id:	494419
Site Specific Name:	COVINGTON GROUP INC
Mailing Address:	740 E CAMPBELL RD, SUITE 515
Mailing City/State/Zip:	75081
Mailing County:	Not reported

A2 **COVINGRON GROUP INC** **RCRA NonGen / NLR** **1017787215**
West **7500 DORT HWY** **FINDS** **MIK203211230**
< 1/8 **GRAND BLANC, MI 48439** **ECHO**
0.022 mi.
117 ft. **Site 2 of 2 in cluster A**

Relative:
Lower

Actual:
852 ft.

RCRA NonGen / NLR:

Date form received by agency:	03/26/2015
Facility name:	COVINGRON GROUP INC
Facility address:	7500 DORT HWY GRAND BLANC, MI 48439
EPA ID:	MIK203211230
Mailing address:	740 E CAMPBELL RD, SUITE 515 RICHARDSON, TX 75081
Contact:	MIKE P THRASHER
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	(440) 258-5619
Contact email:	MTHRASHER@COVINGTONGROUPINC.COM
EPA Region:	05
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	COVINGTON GROUP INC
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	03/26/2015
Owner/Op end date:	Not reported

Owner/operator name:	COVINGTON GROUP INC
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	03/26/2015
Owner/Op end date:	Not reported

COVINGRON GROUP INC (Continued) **1017787215**

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

FINDS:

Registry ID: 110064019798

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1017787215
Registry ID: 110064019798
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110064019798

B3 **GRAND CASTLE MART** **RCRA NonGen / NLR** **1007101486**
North **3041 E GRAND BLANC RD** **MIK982398927**
< 1/8 **GRAND BLANC, MI 48439**
0.037 mi.
193 ft. **Site 1 of 5 in cluster B**

Relative:
Lower

Actual:
831 ft.

RCRA NonGen / NLR:
Date form received by agency: 10/21/2003
Facility name: GRAND CASTLE MART
Facility address: 3041 E GRAND BLANC RD
GRAND BLANC, MI 48439
EPA ID: MIK982398927
Mailing address: 16853 DIXIE HWY
DAVISBURG, MI 48350
Contact: GEORGE KHENO
Contact address: 3041 E GRAND BLANC RD
GRAND BLANC, MI 48439

GRAND CASTLE MART (Continued) **1007101486**

Contact country: US
Contact telephone: (810) 695-4210
Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: SAAD NANNOSHI
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 06/17/1997
Owner/Op end date: Not reported

Owner/operator name: SAAD NANNOSHI
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 06/17/1997
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

B4 **CASTLE PLAZA** **MI UST** **U003426190**
North **3041 E GRAND BLANC RD** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.037 mi.
193 ft. **Site 2 of 5 in cluster B**

Relative:
Lower

Actual:
831 ft.

UST:

Facility ID:	00039300
Facility Type:	ACTIVE
Owner Name:	NANNOSHI PROP INC
Owner Address:	3041 E GRAND BLANC RD
Owner City,St,Zip:	GRAND BLANC, MI 48439-8116
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(810) 694-1880
Contact:	George Kheno
Contact Phone:	(810) 210-7960
Date of Collection:	07/05/2015
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Latitude:	42.91618
Longitude:	-83.64993

Tank ID:	1
Tank Status:	**Currently In Use**
Capacity:	12000
Product:	Gasoline
Install Date:	05/06/1997
Remove Date:	Not reported
Tank Release Detection:	Interstitial Monitoring Double Walled Tank
Pipe Realease Detection:	Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material:	Double Walled, Flexible Piping
Piping Type:	Pressure
Construction Material:	Fiberglass Reinforced Plastic, Double Walled
Impressed Device:	No

Tank ID:	2
Tank Status:	**Currently In Use**
Capacity:	10000
Product:	Gasoline
Install Date:	05/06/1997
Remove Date:	Not reported
Tank Release Detection:	Interstitial Monitoring Double Walled Tank
Pipe Realease Detection:	Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material:	Double Walled, Flexible Piping
Piping Type:	Pressure
Construction Material:	Fiberglass Reinforced Plastic, Double Walled
Impressed Device:	No

Tank ID:	3

CASTLE PLAZA (Continued) **U003426190**

Tank Status:	**Currently In Use**
Capacity:	6000
Product:	Diesel
Install Date:	05/06/1997
Remove Date:	Not reported
Tank Release Detection:	Interstitial Monitoring Double Walled Tank
Pipe Realease Detection:	Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material:	Double Walled, Flexible Piping
Piping Type:	Pressure
Construction Material:	Fiberglass Reinforced Plastic, Double Walled
Impressed Device:	No

B5 **EDR Hist Auto** **1015406914**
North **3041 E GRAND BLANC RD** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.037 mi.
193 ft. **Site 3 of 5 in cluster B**

Relative:
Lower

Actual:
831 ft.

EDR Historical Auto Stations:

Name:	GRAND CASTLE MOBILE MART
Year:	2001
Address:	3041 E GRAND BLANC RD
Name:	GRAND CASTLE MOBILE MART
Year:	2002
Address:	3041 E GRAND BLANC RD
Name:	GRAND CASTLE MOBILE MART
Year:	2005
Address:	3041 E GRAND BLANC RD
Name:	MARATHON FOOD CENTER
Year:	2006
Address:	3041 E GRAND BLANC RD
Name:	MARATHON FOOD CENTER
Year:	2007
Address:	3041 E GRAND BLANC RD
Name:	GRAND CASTLE MARATHON
Year:	2010
Address:	3041 E GRAND BLANC RD
Name:	GRAND CASTLE MARATHON
Year:	2012
Address:	3041 E GRAND BLANC RD

B6 **GRAND CASTLE MART** **FINDS** **1007213603**
North **3041 E GRAND BLANC RD** **ECHO** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.037 mi.
193 ft. **Site 4 of 5 in cluster B**

Relative:
Lower

Actual:
831 ft.

FINDS:

Registry ID: 110016717766

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:

Envid: 1007213603
Registry ID: 110016717766
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110016717766

B7 **GRAND CASTLE MART** **MI WDS** **S111975280**
North **3041 E GRAND BLANC RD** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.037 mi.
193 ft. **Site 5 of 5 in cluster B**

Relative:
Lower

Actual:
831 ft.

WDS:

Site Id: MIK982398927
WMD Id: 476299
Site Specific Name: GRAND CASTLE MART
Mailing Address: 16853 DIXIE HWY
Mailing City/State/Zip: 48350
Mailing County: OAKLAND

C8 **GRAND BLANC II** **FINDS** **1010037637**
NNE **8166 EMBURY ROAD** **ECHO** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.059 mi.
311 ft. **Site 1 of 5 in cluster C**

Relative:
Lower

Actual:
856 ft.

FINDS:

Registry ID: 110028065901

Environmental Interest/Information System

ICIS (Integrated Compliance Information System) is the Integrated Compliance Information System and provides a database that, when complete, will contain integrated Enforcement and Compliance information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain Enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions. This information is maintained in ICIS by EPA in the Regional offices and it Headquarters. A future release of ICIS will replace the Permit

GRAND BLANC II (Continued) **1010037637**

Compliance System (PCS) which supports the NPDES and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities occurring in the Region that support Compliance and Enforcement programs. These include; Incident Tracking, Compliance Assistance, and Compliance Monitoring.

ECHO:
Envid: 1010037637
Registry ID: 110028065901
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110028065901

D9 **US 23 AUTOCARE & TOWING** **FINDS** **1015905837**
NNW **GREEN VALLEY RD & GRAND BLANC** **ECHO** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.081 mi.
427 ft. **Site 1 of 4 in cluster D**

Relative:
Lower

Actual:
838 ft.

FINDS:

Registry ID: 110044817491

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1015905837
Registry ID: 110044817491
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110044817491

D10 **US 23 AUTOCARE & TOWING** **RCRA NonGen / NLR** **1014924322**
NNW **GREEN VALLEY RD & GRAND BLANC** **MIK166695989**
< 1/8 **GRAND BLANC, MI 48439**
0.081 mi.
427 ft. **Site 2 of 4 in cluster D**

Relative:
Lower

Actual:
838 ft.

RCRA NonGen / NLR:
Date form received by agency: 10/04/2011
Facility name: US 23 AUTOCARE & TOWING
Facility address: GREEN VALLEY RD & GRAND BLANC
GRAND BLANC, MI 48439
EPA ID: MIK166695989
Mailing address: 2511 W GRAND BLANC RD
GRAND BLANC, MI 48439
Contact: DONALD FEE
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: (810) 655-5959

US 23 AUTOCARE & TOWING (Continued) **1014924322**

Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: US 23 AUTOCARE & TOWING
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 10/04/2011
Owner/Op end date: Not reported

Owner/operator name: US 23 AUTOCARE & TOWING
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 10/04/2011
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

D11 **US 23 AUTOCARE & TOWING** **MI WDS** **S111985010**
NNW **GREEN VALLEY RD & GRAND BLANC RD** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.081 mi.
427 ft. **Site 3 of 4 in cluster D**

Relative:
Lower

Actual:
838 ft.

WDS:

Site Id:	MIK166695989
WMD Id:	490312
Site Specific Name:	US 23 AUTOCARE & TOWING
Mailing Address:	2511 W GRAND BLANC RD
Mailing City/State/Zip:	48439
Mailing County:	GENESEE

C12 **BARRON PRECISION INSTRUMENTS** **FINDS** **1010436468**
NNE **8170 EMBURY RD** **ECHO** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.112 mi.
591 ft. **Site 2 of 5 in cluster C**

Relative:
Lower

Actual:
856 ft.

FINDS:

Registry ID: 110031328971

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:

Envid:	1010436468
Registry ID:	110031328971
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110031328971

C13 **BARRON PRECISION INSTRUMENTS** **RCRA-SQG** **1010320784**
NNE **8170 EMBURY RD** **MIK742177280**
< 1/8 **GRAND BLANC, MI 48439**
0.112 mi.
591 ft. **Site 3 of 5 in cluster C**

Relative:
Lower

Actual:
856 ft.

RCRA-SQG:

Date form received by agency:	05/17/2006
Facility name:	BARRON PRECISION INSTRUMENTS
Facility address:	8170 EMBURY RD GRAND BLANC, MI 48439
EPA ID:	MIK742177280
Contact:	SCOTT MANSHIP
Contact address:	8170 EMBURY RD GRAND BLANC, MI 48439
Contact country:	US
Contact telephone:	(810) 695-2080
Contact email:	Not reported
EPA Region:	05
Land type:	Private

BARRON PRECISION INSTRUMENTS (Continued) **1010320784**

Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: MILFORD BARRON TRUST
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 07/10/1992
Owner/Op end date: Not reported

Owner/operator name: MILFORD BARRON TRUST
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 07/10/1992
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Historical Generators:
Date form received by agency: 01/01/1980
Site name: BARRON PRECISION INSTRUMENTS
Classification: Not a generator, verified

. Waste code: D001
. Waste name: IGNITABLE WASTE

BARRON PRECISION INSTRUMENTS (Continued) **1010320784**

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: LDR - General
Date violation determined: 09/29/2014
Date achieved compliance: Not reported
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/30/2014
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 09/29/2014
Date achieved compliance: Not reported
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/30/2014
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 09/29/2014
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: LDR - General
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/29/2014
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: Not reported
Evaluation lead agency: State

C14 **BARRON PRECISION INSTRUMENTS** **MI WDS** **S111957411**
NNE **8170 EMBURY RD** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.112 mi.
591 ft. **Site 4 of 5 in cluster C**

Relative:
Lower

Actual:
856 ft.

WDS:
Site Id: MIK742177280
WMD Id: 439815
Site Specific Name: BARRON PRECISION INSTRUMENTS
Mailing Address: 8170 EMBURY RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

E15
NNE
< 1/8
0.113 mi.
598 ft.

CHIPPEWA MANAGEMENT LLC
8018 EMBURY
GRAND BLANC, MI 48439

FINDS **1008387669**
ECHO **N/A**

Site 1 of 3 in cluster E

Relative:
Lower

Actual:
842 ft.

FINDS:

Registry ID: 110022526266

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:

Envid: 1008387669
Registry ID: 110022526266
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110022526266

E16
NNE
< 1/8
0.113 mi.
598 ft.

CHIPPEWA MANAGEMENT LLC
8018 EMBURY
GRAND BLANC, MI 48439

RCRA-CESQG **1008373634**
MIK676936198

Site 2 of 3 in cluster E

Relative:
Lower

Actual:
842 ft.

RCRA-CESQG:

Date form received by agency: 07/18/2005
Facility name: CHIPPEWA MANAGEMENT LLC
Facility address: 8018 EMBURY
GRAND BLANC, MI 48439
EPA ID: MIK676936198
Mailing address: 8018 EMBURY RD
GRAND BLANC, MI 48439
Contact: JOHN LAKE
Contact address: 8018 EMBURY
GRAND BLANC, MI 48439
Contact country: US
Contact telephone: (810) 579-0623
Contact email: Not reported
EPA Region: 05
Land type: Private
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from

CHIPPEWA MANAGEMENT LLC (Continued) **1008373634**

the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	CHIPPEWA MANAGEMENT LLC
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	06/01/2004
Owner/Op end date:	Not reported

Owner/operator name:	CHIPPEWA MANAGEMENT LLC
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	06/01/2004
Owner/Op end date:	Not reported

Owner/operator name:	EMBURY HOLDINGS
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	06/01/2004
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

. Waste code:	D001
. Waste name:	IGNITABLE WASTE

Historical Generators:

Date form received by agency: 01/01/1980

CHIPPEWA MANAGEMENT LLC (Continued) **1008373634**

Site name: CHIPPEWA MANAGEMENT LLC
Classification: Not a generator, verified

. Waste code: D001
. Waste name: IGNITABLE WASTE

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Used Oil - Definitions
Date violation determined: 09/15/2003
Date achieved compliance: Not reported
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/17/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 09/15/2003
Date achieved compliance: 02/24/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/17/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Used Oil - Dust Suppressant and Disposal
Date violation determined: 09/15/2003
Date achieved compliance: 02/24/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/17/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 09/15/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Used Oil - Dust Suppressant and Disposal
Date achieved compliance: 02/24/2010
Evaluation lead agency: State

CHIPPEWA MANAGEMENT LLC (Continued) **1008373634**

Evaluation date: 09/15/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: State Statute or Regulation
Date achieved compliance: 02/24/2010
Evaluation lead agency: State

Evaluation date: 09/15/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Used Oil - Definitions
Date achieved compliance: Not reported
Evaluation lead agency: State

E17
NNE
< 1/8
0.113 mi.
598 ft.

CHIPPEWA MANAGEMENT LLC **MI WDS** **S111956606**
8018 EMBURY **N/A**
GRAND BLANC, MI 48439

Site 3 of 3 in cluster E

Relative:
Lower

Actual:
842 ft.

WDS:
Site Id: MIK676936198
WMD Id: 438724
Site Specific Name: CHIPPEWA MANAGEMENT LLC
Mailing Address: 8018 EMBURY RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

C18
NNE
< 1/8
0.114 mi.
602 ft.

LOON LAKE PRECISION **MI WDS** **S111952980**
8200 EMBURY RD **N/A**
GRAND BLANC, MI 48439

Site 5 of 5 in cluster C

Relative:
Higher

Actual:
860 ft.

WDS:
Site Id: MIG000056822
WMD Id: 427103
Site Specific Name: LOON LAKE PRECISION
Mailing Address: 8200 EMBURY RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

F19
SE
< 1/8
0.116 mi.
610 ft.

MIDWEST POOLS INC **FINDS** **1017373397**
3090 W COOK RD **ECHO** **N/A**
GRAND BLANC, MI 48439

Site 1 of 4 in cluster F

Relative:
Lower

Actual:
854 ft.

FINDS:

Registry ID: 110061058073

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and

MIDWEST POOLS INC (Continued) **1017373397**

corrective action activities required under RCRA.

ECHO:
Envid: 1017373397
Registry ID: 110061058073
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110061058073

F20 **LEADING EDGE FIBERGLASS POOL** **MI AIRS S110531055**
SE **3090 W COOK ROAD** **MI WDS N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.116 mi.
610 ft. **Site 2 of 4 in cluster F**

Relative:
Lower

Actual:
854 ft.

AIRS:
State Registration Number: N7982
Naics Code: Not reported
Contact Name: SCOTT HOOVER
Contact Phone: 8106557665
Contact Address: LEADING EDGE FIBERGLASS POOL
Contact Address 2: 3090 W COOK ROAD
Contact City,St,Zip: GRAND BLANC, MI 48439
Permit Number: 53-08A
Date Received: 02/09/2012
Application Reason: OPEN MOLDING PROCESS FOR FIBERGLASS POOL PRODUCTIO
Record Type: Not reported
State County FIPS: Not reported
Facility Category: Not reported
SIC Primary: Not reported
Tribal Code: Not reported
Facility Status: Not reported
Supplemental Location Text: Not reported
Business Name: Not reported
Principal Product: Not reported
Principal Product Description: Not reported
UTM Zone (Geo Coordinates Universal Transverse Mercator System): Not reported
UTM Horizontal Coord: Not reported
UTM Vertical Coord: Not reported
Mailing Name: Not reported
Mailing Contact Person: Not reported
Mailing Street: Not reported
Mailing City: Not reported
Mailing State: Not reported
Mailing Zip: Not reported
Mailing Zip 4 Extension: Not reported
Compliance Person: Not reported
Compliance Area Code: Not reported
Compliance Phone Number: Not reported
Emission Inventory Contact Person: Not reported
EI Contact Area Code: Not reported
EI Contact Phone Number: Not reported
Permit Contact Person: Not reported
Permit Contact Person Area Code: Not reported
Permit Contact Person Phone Number: Not reported
Federal Employer Id Number: Not reported
Of Employees: Not reported
Reporting Year: Not reported

LEADING EDGE FIBERGLASS POOL (Continued) **S110531055**

Date Record Was Created: Not reported

WDS:
Site Id: MIK838648332
WMD Id: 493768
Site Specific Name: LEADING EDGE POOLS
Mailing Address: 3090 W COOK RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

F21 **MIDWEST POOLS INC** **RCRA-CESQG** **1016958422**
SE **3090 W COOK RD** **MIK838648332**
< 1/8 **GRAND BLANC, MI 48439**
0.116 mi.
610 ft. **Site 3 of 4 in cluster F**

Relative:
Lower

Actual:
854 ft.

RCRA-CESQG:
Date form received by agency: 07/28/2014
Facility name: MIDWEST POOLS INC
Facility address: 3090 W COOK RD
GRAND BLANC, MI 48439
EPA ID: MIK838648332
Contact: VAUGHUN STRUBLEN
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: (810) 288-0653
Contact email: SEAN.KELLY@WASTE365.COM
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: SCOTT M HOOVER
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 06/01/2006
Owner/Op end date: Not reported

Owner/operator name: SCOTT M HOOVER

MIDWEST POOLS INC (Continued) **1016958422**

Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 06/01/2006
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

F22 **LEADING EDGE FIBERGLASS POOL** **US AIRS** **1016089129**
SE **3090 W COOK RD** **FINDS** **N/A**
< 1/8 **GRAND BLANC, MI 48439** **ECHO**
0.116 mi.
610 ft. **Site 4 of 4 in cluster F**

Relative:
Lower

Actual:
854 ft.

US AIRS (AFS):
Envid: 1016089129
Region Code: 05
County Code: MI049
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
D and B Number: Not reported
Facility Site Name: LEADING EDGE FIBERGLASS POOL
Primary SIC Code: Not reported
NAICS Code: 326130
Default Air Classification Code: SMI
Facility Type of Ownership Code: POF
Air CMS Category Code: SMI
HPV Status: Not reported

US AIRS (AFS):
Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: Federally-Enforceable State Operating Permit - Non Title V

LEADING EDGE FIBERGLASS POOL (Continued) **1016089129**

Activity Date: 2012-06-12 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: Federally-Enforceable State Operating Permit - Non Title V
Activity Date: 2012-07-02 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: Federally-Enforceable State Operating Permit - Non Title V
Activity Date: 2013-04-11 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: New Source Review Permit Requirements
Activity Date: 2012-06-12 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: New Source Review Permit Requirements
Activity Date: 2012-07-02 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437

LEADING EDGE FIBERGLASS POOL (Continued) **1016089129**

Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: New Source Review Permit Requirements
Activity Date: 2013-04-11 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2011-07-14 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2011-08-24 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2012-06-12 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2012-07-02 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

LEADING EDGE FIBERGLASS POOL (Continued) **1016089129**

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2013-04-11 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2011-07-19 00:00:00
Activity Status Date: 2011-07-19 00:00:00
Activity Group: Enforcement Action
Activity Type: Administrative - Informal
Activity Status: Achieved

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2011-08-24 00:00:00
Activity Status Date: 2011-08-24 00:00:00
Activity Group: Enforcement Action
Activity Type: Administrative - Informal
Activity Status: Achieved

Region Code: 05
Programmatic ID: AIR MI00000000000N7982
Facility Registry ID: 110043975437
Air Operating Status Code: OPR
Default Air Classification Code: SMI
Air Program: Title V Permits
Activity Date: Not reported
Activity Status Date: 2014-10-19 00:00:00
Activity Group: Case File
Activity Type: Case File
Activity Status: Case File Data Entered

FINDS:

Registry ID: 110043975437

Environmental Interest/Information System
AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of

LEADING EDGE FIBERGLASS POOL (Continued) **1016089129**

Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

AIR EMISSIONS CLASSIFICATION UNKNOWN

AIR SYNTHETIC MINOR

ECHO:
Envid: 1016089129
Registry ID: 110043975437
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110043975437

G23 **BULLET ENGINEERING LLC** **FINDS** **1015908241**
NE **8242 EMBURY RD** **ECHO** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.117 mi.
620 ft. **Site 1 of 4 in cluster G**

Relative: Higher

Actual: 860 ft.

FINDS:

Registry ID: 110044820236

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1015908241
Registry ID: 110044820236
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110044820236

G24 **BULLET ENGINEERING LLC** **MI WDS** **S111984713**
NE **8242 EMBURY RD** **N/A**
< 1/8 **GRAND BLANC, MI 48439**
0.117 mi.
620 ft. **Site 2 of 4 in cluster G**

Relative: Higher

Actual: 860 ft.

WDS:
Site Id: MIK880347753
WMD Id: 489923
Site Specific Name: BULLET ENGINEERING
Mailing Address: 8242 EMBURY RD
Mailing City/State/Zip: 48439

BULLET ENGINEERING LLC (Continued) **S111984713**

Mailing County: GENESEE

G25
NE
< 1/8
0.117 mi.
620 ft.

BULLET ENGINEERING LLC **RCRA NonGen / NLR** **1014925189**
8242 EMBURY RD **MIK880347753**
GRAND BLANC, MI 48439

Site 3 of 4 in cluster G

Relative:
Higher

Actual:
860 ft.

RCRA NonGen / NLR:

Date form received by agency:	07/11/2011
Facility name:	BULLET ENGINEERING LLC
Facility address:	8242 EMBURY RD GRAND BLANC, MI 48439
EPA ID:	MIK880347753
Contact:	KENNETH W COOPER
Contact address:	Not reported Not reported
Contact country:	US
Contact telephone:	(810) 394-9863
Contact email:	BULLETENG@CHARTER.NET
EPA Region:	05
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	KENNETH W COOPER
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	03/01/2011
Owner/Op end date:	Not reported

Owner/operator name:	KENNETH W COOPER
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	03/01/2011
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No

BULLET ENGINEERING LLC (Continued) **1014925189**

Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

G26
NE
< 1/8
0.118 mi.
625 ft.

PREMIER TOOLING **MI WDS** **S111956625**
8260 EMBURY RD **N/A**
GRAND BLANC, MI 48439

Site 4 of 4 in cluster G

Relative:
Higher

Actual:
859 ft.

WDS:
Site Id: MIG000048842
WMD Id: 438750
Site Specific Name: PREMIER TOOLING
Mailing Address: 8260 EMBURY RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

D27
NNW
1/8-1/4
0.169 mi.
892 ft.

US 23 MARATHON **MI AST** **A100206672**
2456 GRAND BLANC RD **N/A**
GRAND BLANC, MI 48439

Site 4 of 4 in cluster D

Relative:
Lower

Actual:
849 ft.

AST:
Facility ID: 92025075
Facility Phone: ( ) -
Owner Name: US 23 MARATHON
Owner Address: 2456 GRAND BLANC RD
Owner City,St,Zip: GRAND BLANC, MI 48439-9340
Owner County: USA
Owner Contact: Not reported
Owner Telephone: (810) 655-6954
District: Lansing District Office
Contact: Not reported
List Status: CLOSED
Date of Collection: 07/26/2005
Accuracy: 100 FEET
Source: STATE OF MICHIGAN
Point Line Area: POINT
Description Category: Plant Entrance (Freight)
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Horizontal Datum: NAD83
Latitude: 42.9145660
Longitude: -83.729976

Tank Id: 1
Tank Status: Removed from Premises
Capacity (in gallons): 1000
Installation Date: 06/20/1984
Substance Stored: LPG

US 23 MARATHON (Continued) **A100206672**

Removed/Closed Date: 05/05/1998

H28 **MI SPILLS** **S109605460**
NNW **8009 DUNGARVIN** **N/A**
1/8-1/4 **GRAND BLANC, MI**
0.231 mi.
1218 ft. **Site 1 of 4 in cluster H**

Relative:
Lower

Actual:
851 ft.

PEAS:

Incident Date:	06/24/2009
Office Status:	Not reported
Initials of Incoming Operator:	Not reported
Time Received by DNRE Staff:	Not reported
Time Occur:	Not reported
Date Of PEAS Call:	Not reported
Complainant / Company:	Not reported
Complainant Address:	Not reported
Company Involved:	Not reported
DEQ Division Involved:	Not reported
Incident Description:	IT WAS CONTAINED.OVERHEAD POLE MOUNT TRANSFORMER WAS LEAKING AT BASE OF POLE;
Description:	Not reported
Date Discovered:	Not reported
Time Discovered:	Not reported
Office/After Hours:	Not reported
Party Involved - Phone 1:	Not reported
Party Involved - Phone 2:	Not reported
Ongoing?:	Not reported
Release Secured:	Not reported
Source:	Not reported
Lead Division 2:	Not reported

Incident Date:	06/24/2009
Office Status:	Not reported
Initials of Incoming Operator:	Not reported
Time Received by DNRE Staff:	Not reported
Time Occur:	Not reported
Date Of PEAS Call:	Not reported
Complainant / Company:	Not reported
Complainant Address:	3201 E. COURT ST.
Company Involved:	CONSUMERS
DEQ Division Involved:	Not reported
Incident Description:	OVERHEAD POLE MOUNT TRANSFORMER WAS LEAKING AT BASE OF POLE;AND OIL WENT INTO DRAIN. BOOMS ARE AT DRAINS AND CONTRACTORCOMING TO PUMP OUT CATCHBASINS. NO NEED TO CALL BACK UNLESS YOU WANTTO.
Description:	Not reported
Date Discovered:	6/24/2009
Time Discovered:	3:00
Office/After Hours:	Not reported
Party Involved - Phone 1:	Not reported
Party Involved - Phone 2:	Not reported
Ongoing?:	Not reported
Release Secured:	Not reported
Source:	Not reported
Lead Division 2:	Not reported

H29 **ERNS** **2008909545**
NNW **8009 DUNGARVIN DRIVE** **N/A**
1/8-1/4 **GRAND BLANC, MI**
0.231 mi.
1218 ft. **Site 2 of 4 in cluster H**

Relative:
Lower

Click this hyperlink while viewing on your computer to access additional ERNS detail in the EDR Site Report.

Actual:
851 ft.

H30 **MI SPILLS** **S110364983**
NNW **8009 DUNGARVIN DRIVE, GRAND BLANC, MI** **N/A**
1/8-1/4 **GRAND BLANC, MI**
0.231 mi.
1218 ft. **Site 3 of 4 in cluster H**

Relative:
Lower

Actual:
851 ft.

PEAS:

Incident Date:	06/24/2009
Office Status:	Not reported
Initials of Incoming Operator:	Not reported
Time Received by DNRE Staff:	Not reported
Time Occur:	Not reported
Date Of PEAS Call:	Not reported
Complainant / Company:	Not reported
Complainant Address:	Not reported
Company Involved:	Not reported
DEQ Division Involved:	RRD
Incident Description:	STATED THERE IS A STORM DRAIN AT THE BASE OF THE POLE, BUTIT IS UNKNOWN IF ANY MATERIAL REACHED THE DRAIN AT THIS TIME.CALLER STATED AN OVERHEAD TRANSFORMER IS LEAKING OIL ONTO THE GROUND. CALLER
Description:	Not reported
Date Discovered:	Not reported
Time Discovered:	Not reported
Office/After Hours:	Not reported
Party Involved - Phone 1:	Not reported
Party Involved - Phone 2:	Not reported
Ongoing?:	Not reported
Release Secured:	Not reported
Source:	Not reported
Lead Division 2:	Not reported

Incident Date:	06/24/2009
Office Status:	Not reported
Initials of Incoming Operator:	Not reported
Time Received by DNRE Staff:	Not reported
Time Occur:	Not reported
Date Of PEAS Call:	Not reported
Complainant / Company:	Not reported
Complainant Address:	3201 E. COURT ST.
Company Involved:	PAUL KUMRITS/CONSUMERS ENERGY
DEQ Division Involved:	RRD
Incident Description:	CALLER STATED AN OVERHEAD TRANSFORMER IS LEAKING OIL ONTO THE GROUND. CALLERSTREET.
Description:	Not reported
Date Discovered:	6/24/2009
Time Discovered:	6:34
Office/After Hours:	Not reported
Party Involved - Phone 1:	Not reported
Party Involved - Phone 2:	Not reported
Ongoing?:	Not reported
Release Secured:	Not reported

(Continued) **S110364983**

Source: Not reported
Lead Division 2: Not reported

H31 **ERNS** **2009909545**
NNW **8009 DUNGARVIN DRIVE** **N/A**
1/8-1/4 **GRAND BLANC, MI**
0.231 mi.
1218 ft. **Site 4 of 4 in cluster H**

Relative:
Lower

Click this hyperlink while viewing on your computer to access additional ERNS detail in the EDR Site Report.

Actual:
851 ft.

I32 **THE UNIVERSITY OF MICHIGAN - HEALTH SYSTEM** **RCRA-CESQG** **1018157566**
NNE **3181 E GRAND BLANC RD** **MIK355085485**
1/8-1/4 **GRAND BLANC, MI 48439**
0.243 mi.
1283 ft. **Site 1 of 2 in cluster I**

Relative:
Lower

Actual:
854 ft.

RCRA-CESQG:
Date form received by agency: 10/22/2015
Facility name: THE UNIVERSITY OF MICHIGAN - HEALTH SYSTEM
Facility address: 3181 E GRAND BLANC RD
GRAND BLANC, MI 48439
EPA ID: MIK355085485
Mailing address: 1655 DEAN RD
ANN ARBOR, MI 48109
Contact: CATHY BROCKWAY
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: (810) 694-6933
Contact email: CABROCKW@MED.UMICH.EDU
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: REGENTS OF THE UNIVERSITY OF MICHIGAN
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: State

THE UNIVERSITY OF MICHIGAN - HEALTH SYSTEM (Continued) **1018157566**

Owner/Operator Type:	Owner
Owner/Op start date:	01/01/2015
Owner/Op end date:	Not reported
Owner/operator name:	REGENTS OF THE UNIVERSITY OF MICHIGAN
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	State
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/2015
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

I33 **THE UNIVERSITY OF MICHIGAN - HEALTH SYSTEM** **MI WDS** **S118471295**
NNE **3181 E GRAND BLANC RD** **N/A**
1/8-1/4 **GRAND BLANC, MI 48439**
0.243 mi.
1283 ft. **Site 2 of 2 in cluster I**

Relative:
Lower

Actual:
854 ft.

WDS:

Site Id:	MIK355085485
WMD Id:	495533
Site Specific Name:	KELLOGG EYE CENTER - GRAND BLANC
Mailing Address:	1655 DEAN RD
Mailing City/State/Zip:	48109
Mailing County:	WASHTENAW

J34 **BONNIE PERRY RESIDENCE** **MI WDS** **S111971534**
NNE **3199 HOSPERS ST** **N/A**
1/4-1/2 **GRAND BLANC, MI 48439**
0.337 mi.
1779 ft. **Site 1 of 3 in cluster J**

Relative:
Lower

Actual:
857 ft.

WDS:

Site Id:	MIK146968854
WMD Id:	464421
Site Specific Name:	BONNIE PERRY RESIDENCE
Mailing Address:	304 CENTER ST
Mailing City/State/Zip:	48442
Mailing County:	OAKLAND

J35 **BONNIE PERRY RESIDENCE** **FINDS** **1007142832**
NNE **3199 HOSPERS ST** **ECHO** **N/A**
1/4-1/2 **GRAND BLANC, MI 48439**
0.337 mi.
1779 ft. **Site 2 of 3 in cluster J**

Relative:
Lower

Actual:
857 ft.

FINDS:

Registry ID: 110015912431

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:

Envid:	1007142832
Registry ID:	110015912431
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110015912431

J36 **BONNIE PERRY RESIDENCE** **RCRA-CESQG** **1007096120**
NNE **3199 HOSPERS ST** **MIK146968854**
1/4-1/2 **GRAND BLANC, MI 48439**
0.337 mi.
1779 ft. **Site 3 of 3 in cluster J**

Relative:
Lower

Actual:
857 ft.

RCRA-CESQG:

Date form received by agency:	09/11/2001
Facility name:	BONNIE PERRY RESIDENCE
Facility address:	3199 HOSPERS ST GRAND BLANC, MI 48439
EPA ID:	MIK146968854
Mailing address:	304 CENTER ST HOLLY, MI 48442
Contact:	BONNIE PERRY
Contact address:	3199 HOSPERS ST GRAND BLANC, MI 48439
Contact country:	US
Contact telephone:	(810) 694-4519
Contact email:	Not reported

BONNIE PERRY RESIDENCE (Continued) **1007096120**

EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: BONNIE PERRY
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 09/10/2001
Owner/Op end date: Not reported

Owner/operator name: BONNIE PERRY
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 09/10/2001
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001

BONNIE PERRY RESIDENCE (Continued) **1007096120**

. Waste name: IGNITABLE WASTE

Historical Generators:
Date form received by agency: 09/10/2000
Site name: BONNIE PERRY RESIDENCE
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

37
SW
1/4-1/2
0.378 mi.
1998 ft.

EDWARD MAGNER **MI WDS** **S111961122**
2356 E COOK RD **N/A**
GRAND BLANC, MI 48439

Relative:
Lower

Actual:
857 ft.

WDS:
Site Id: MIG000036272
WMD Id: 445035
Site Specific Name: EDWARD MAGNER
Mailing Address: 2356 E COOK RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

K38
SSE
1/4-1/2
0.380 mi.
2007 ft.

GENESYS REGIONAL MED CTR **RCRA-SQG** **1001196586**
1 GENESYS PARKWAY **FINDS** **MIR000022095**
GRAND BLANC, MI 48439 **RI MANIFEST**
ECHO

Site 1 of 4 in cluster K

Relative:
Higher

Actual:
892 ft.

RCRA-SQG:
Date form received by agency: 08/05/2014
Facility name: GENESYS REGIONAL MED CTR
Facility address: 1 GENESYS PARKWAY
GRAND BLANC, MI 48439
EPA ID: MIR000022095
Mailing address: 1 GENESYS PKWY
GRAND BLANC, MI 48439
Contact: SCOTT W CRUZEN
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: (810) 606-6961
Contact email: SCRUZEN@GENESYS.ORG
EPA Region: 05
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: GENESYS REGIONAL MEDICAL CTR

GENESYS REGIONAL MED CTR (Continued) **1001196586**

Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/05/1997
Owner/Op end date: Not reported

Owner/operator name: GENESYS REGIONAL MEDICAL CTR
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 03/05/1997
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Historical Generators:
Date form received by agency: 05/06/2013
Site name: GENESYS REGIONAL MED CTR
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 06/12/2012
Site name: GENESYS REGIONAL MED CTR
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 04/05/2011
Site name: GENESYS REGIONAL MED CTR

GENESYS REGIONAL MED CTR (Continued) **1001196586**

Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 06/07/2010
Site name: GENESYS REGIONAL MED CTR
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 04/01/2009
Site name: GENESYS REGIONAL MED CTR
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 11/06/2008
Site name: GENESYS REGIONAL MED CTR
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 03/05/1997
Site name: GENESYS REGIONAL MED CTR
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

FINDS:

Registry ID: 110003700120

Environmental Interest/Information System

AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

HAZARDOUS AIR POLLUTANT MAJOR

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA

GENESYS REGIONAL MED CTR (Continued) **1001196586**

program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

AIR MINOR

RI MANIFEST:

EPA Id:	MIR000022095
Manifest Document Number:	RIS0052499
GEN Cert Date:	8/8/2001
TSDF Id:	RID040098352
TSDF Name:	NORTHLAND ENVIRONMENTAL INC.
TSDF Date:	Not reported
Transporter 2 Id:	Not reported
Transporter 2 Name:	Not reported
Transporter Receipt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	Not reported
Waste Code2:	Not reported
Waste Code3:	Not reported
Fee Exempt Code:	Not reported
Comment:	Not reported

Details:

EPA ID:	MIR000022095
Manifest Docket Number:	RIS0052499
Waste Description:	LAB PACK WASTE
Quantity:	1
WT/Vol Units:	G
Item Number:	9080
Transporter Name:	REPUBLIC ENV SYS (TRANS GROUP)
Transporter EPA ID:	PAD982661381
GEN Cert Date:	8/8/2001
Transporter Receipt Date:	Not reported
Transporter 2 Receipt Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported

EPA ID:	MIR000022095
Manifest Docket Number:	RIS0052498
Waste Description:	LAB PACK WASTE
Quantity:	3
WT/Vol Units:	G
Item Number:	9076
Transporter Name:	REPUBLIC ENV SYS (TRANS GROUP)
Transporter EPA ID:	PAD982661381
GEN Cert Date:	8/8/2001
Transporter Receipt Date:	Not reported
Transporter 2 Receipt Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported

EPA ID:	MIR000022095
Manifest Docket Number:	RIS0052499
Waste Description:	LAB PACK WASTE
Quantity:	1

GENESYS REGIONAL MED CTR (Continued) **1001196586**

WT/Vol Units:	G
Item Number:	9080
Transporter Name:	REPUBLIC ENV SYS (TRANS GROUP)
Transporter EPA ID:	PAD982661381
GEN Cert Date:	8/8/2001
Transporter Receipt Date:	Not reported
Transporter 2 Receipt Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported

EPA ID:	MIR000022095
Manifest Docket Number:	RIS0052498
Waste Description:	LAB PACK WASTE
Quantity:	3
WT/Vol Units:	G
Item Number:	9076
Transporter Name:	REPUBLIC ENV SYS (TRANS GROUP)
Transporter EPA ID:	PAD982661381
GEN Cert Date:	8/8/2001
Transporter Receipt Date:	Not reported
Transporter 2 Receipt Date:	Not reported
TSDF Receipt Date:	Not reported
Transporter 2 ID:	Not reported

ECHO:

Envid:	1001196586
Registry ID:	110003700120
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110003700120

K39 **GENESYS REGIONAL MED CTR** **MI WDS** **S111943496**
SSE **1 GENESYS PARKWAY** **N/A**
1/4-1/2 **GRAND BLANC, MI 48439**
0.380 mi.
2007 ft. **Site 2 of 4 in cluster K**

Relative:
Higher

Actual:
892 ft.

WDS:

Site Id:	MIR000022095
WMD Id:	411384
Site Specific Name:	GENESYS REGIONAL MED CTR
Mailing Address:	1 GENESYS PKWY
Mailing City/State/Zip:	48439
Mailing County:	GENESEE

K40 **GENESYS REGIONAL MEDICAL CENTER** **MI AST** **A100066761**
SSE **1 GENESYS PKWY** **N/A**
1/4-1/2 **GRAND BLANC, MI 48439**
0.380 mi.
2007 ft. **Site 3 of 4 in cluster K**

Relative:
Higher

Actual:
892 ft.

AST:

Facility ID:	91025137
Facility Phone:	(810) 694-4080
Owner Name:	GENESYS REGIONAL MEDICAL CENTER
Owner Address:	1 GENESYS PKWY
Owner City,St,Zip:	GRAND BLANC, MI 48439-8065

GENESYS REGIONAL MEDICAL CENTER (Continued) **A100066761**

Owner County:	USA
Owner Contact:	Not reported
Owner Telephone:	( ) -
District:	Lansing District Office
Contact:	ROD JONES
List Status:	ACTIVE
Date of Collection:	07/26/2005
Accuracy:	100 FEET
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Description Category:	Plant Entrance (Freight)
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off
Horizontal Datum:	NAD83
Latitude:	42.8926200
Longitude:	-83.640226

Tank Id:	1
Tank Status:	Currently In Use
Capacity (in gallons):	8000
Installation Date:	10/03/1996
Substance Stored:	CL-#2 LOW SULFUR
Removed/Closed Date:	Not reported

Tank Id:	2
Tank Status:	Currently In Use
Capacity (in gallons):	15000
Installation Date:	10/03/1996
Substance Stored:	CL-#2 LOW SULFUR
Removed/Closed Date:	Not reported

K41 **GENESYS REGIONAL MEDICAL CENTER** **US AIRS** **1001126349**
SSE **ONE GENESYS PARKWAY** **N/A**
1/4-1/2 **GRAND BLANC, MI 48439**
0.386 mi.
2037 ft. **Site 4 of 4 in cluster K**

Relative:
Higher

Actual:
892 ft.

US AIRS MINOR:

Envid:	1001126349
Region Code:	05
Programmatic ID:	AIR MI00000000000N6016
Facility Registry ID:	110003700120
D and B Number:	Not reported
Primary SIC Code:	Not reported
NAICS Code:	622110
Default Air Classification Code:	MIN
Facility Type of Ownership Code:	POF
Air CMS Category Code:	Not reported
HPV Status:	Not reported

US AIRS MINOR:

Region Code:	05
Programmatic ID:	AIR MI00000000000N6016
Facility Registry ID:	110003700120
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date:	2011-07-14 00:00:00

GENESYS REGIONAL MEDICAL CENTER (Continued) **1001126349**

Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

L42 **LBC PROPERTIES INVESTMENT** **MI AST** **A100319859**
NW **2330 GRAND BLANC RD** **N/A**
1/4-1/2 **GRAND BLANC, MI 48420**
0.410 mi.
2165 ft. **Site 1 of 2 in cluster L**

Relative:
Lower

Actual:
846 ft.

AST:

Facility ID:	92085133
Facility Phone:	Not reported
Owner Name:	LBC PROPERTIES INVESTMENT
Owner Address:	2330 GRAND BLANC RD
Owner City,St,Zip:	GRAND BLANC, MI 48420
Owner County:	USA
Owner Contact:	Not reported
Owner Telephone:	(810) 686-9171
District:	Lansing District Office
Contact:	Steve Hashia
List Status:	CLOSED
Date of Collection:	Not reported
Accuracy:	Not reported
Source:	Not reported
Point Line Area:	Not reported
Description Category:	Not reported
Method of Collection:	Not reported
Horizontal Datum:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Tank Id:	1
Tank Status:	Removed from Premises
Capacity (in gallons):	1000
Installation Date:	02/25/2008
Substance Stored:	LPG
Removed/Closed Date:	10/30/2009

L43 **GRAND BLANC ROAD BUSINESS CORP** **FINDS** **1015905796**
NW **2330 GRAND BLANC BLVD** **ECHO** **N/A**
1/4-1/2 **GRAND BLANC, MI 48439**
0.422 mi.
2228 ft. **Site 2 of 2 in cluster L**

Relative:
Lower

Actual:
846 ft.

FINDS:

Registry ID: 110044817080

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA

GRAND BLANC ROAD BUSINESS CORP (Continued) **1015905796**

program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1015905796
Registry ID: 110044817080
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110044817080

44
SSE
1/4-1/2
0.490 mi.
2585 ft.

GENESYS DIAGNOSTICS - GRAND BLANC **MLTS** **1012315771**
600 HEALTHPARK BLVD, (B)(7)(F) **N/A**
GRAND BLANC, MI 48439

Relative:
Higher

Actual:
895 ft.

MLTS:
License Number: 21-32771-01
First License Date: 01/13/10
License Date: 12/01/15
Lic. Expiration Date: 01/31/20
Contact Name: Apparao Mukkamala
Contact Phone: 734-662-3197
Institution Code: 32771
Department/Bldg: Not reported
States Allowing Use: Not reported
Store Material Use: No
Redistribution Use: No
Incinerate Use: No
Burial Use: No
Last Inspection Date: 12/14/10
Next Inspection Date: 12/01/15
Licensee Contact: M.D.
Inspector Name: Apparao Mukkamala

45
West
1/2-1
0.593 mi.
3130 ft.

EDR Hist Auto **1015331326**
N/A

2190 LAKE RIDGE DR
GRAND BLANC, MI 48439

Relative:
Lower

Actual:
852 ft.

EDR Historical Auto Stations:
Name: ALPINE AUTO CHARITIES INC
Year: 2008
Address: 2190 LAKE RIDGE DR

Name: ALPINE AUTO CHARITIES INC
Year: 2009
Address: 2190 LAKE RIDGE DR

M46 **RAPID DESIGN SVC INC** **RCRA-CESQG** **1004724083**
North **3089 TRI PARK DR** **FINDS** **MID985656552**
1/2-1 **GRAND BLANC, MI 48439** **ECHO**
0.637 mi.
3363 ft. **Site 1 of 2 in cluster M**

Relative:
Lower

Actual:
841 ft.

RCRA-CESQG:

Date form received by agency:	01/19/1993
Facility name:	RAPID DESIGN SVC INC
Facility address:	3089 TRI PARK DR GRAND BLANC, MI 48439
EPA ID:	MID985656552
Contact:	KATHY BLACK
Contact address:	3089 TRI PARK DR GRAND BLANC, MI 48439
Contact country:	US
Contact telephone:	(313) 695-9630
Contact email:	Not reported
EPA Region:	05
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	RAPID DESIGN SVC INC
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/1970
Owner/Op end date:	Not reported

Owner/operator name:	RAPID DESIGN SVC INC
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/1970
Owner/Op end date:	Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No

RAPID DESIGN SVC INC (Continued) **1004724083**

Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Historical Generators:
Date form received by agency: 01/01/1980
Site name: RAPID DESIGN SVC INC
Classification: Not a generator, verified

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

FINDS:

Registry ID: 110003678850

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1004724083
Registry ID: 110003678850
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110003678850

M47 **SELMURO LTD** **RCRA-CESQG** **1001220222**
North **3111 TRI PARK DR** **FINDS** **MIR000032177**
1/2-1 **GRAND BLANC, MI 48439** **ECHO**
0.648 mi.
3421 ft. **Site 2 of 2 in cluster M**

Relative:
Lower

Actual:
841 ft.

RCRA-CESQG:
Date form received by agency: 12/05/2005
Facility name: SELMURO LTD
Facility address: 3111 TRI PARK DR
GRAND BLANC, MI 48439

SELMURO LTD (Continued) **1001220222**

EPA ID: MIR000032177
Contact: TONYA SCHULTZ
Contact address: 3111 TRI PARK DR
GRAND BLANC, MI 48439
Contact country: US
Contact telephone: (810) 603-2117
Contact email: Not reported
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: THOMAS BARRETT
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Owner/operator name: THOMAS BARRETT
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Owner/operator name: THOMAS SELF & RICHARD OULLETTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/01/1992
Owner/Op end date: Not reported

Owner/operator name: THOMAS SELF & RICHARD OULLETTE
Owner/operator address: Not reported

SELMURO LTD (Continued) **1001220222**

Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/01/1992
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Historical Generators:
Date form received by agency: 02/26/2004
Site name: SELMURO LTD
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 05/08/1998
Site name: SELMURO LTD
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

FINDS:

Registry ID: 110003705919

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

SELMURO LTD (Continued) **1001220222**

ECHO:
Envid: 1001220222
Registry ID: 110003705919
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110003705919

48
North
1/2-1
0.657 mi.
3469 ft.

Relative:
Lower

Actual:
837 ft.

MAC ARTHUR CORPORATION **RCRA-CESQG** **1008373425**
3190 TRI PARK DR **MIK272354549**
GRAND BLANC, MI 48439

RCRA-CESQG:
Date form received by agency: 04/12/2011
Facility name: MAC ARTHUR CORPORATION
Facility address: 3190 TRI PARK DR
GRAND BLANC, MI 48439
EPA ID: MIK272354549
Contact: MICHAEL G BROWNRIGG
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: (810) 606-1777
Telephone ext.: 144
Contact email: RIG@MACARTHURCORP.COM
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: MAC ARTHUR CORPORATION
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 08/01/2000
Owner/Op end date: Not reported

Owner/operator name: MAC ARTHUR CORPORATION
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported

MAC ARTHUR CORPORATION (Continued) **1008373425**

Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 08/01/2000
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001
. Waste name: IGNITABLE WASTE

Historical Generators:
Date form received by agency: 04/21/2009
Site name: MAC ARTHUR CORPORATION
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 03/27/2007
Site name: MAC ARTHUR CORPORATION
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 08/01/2000
Site name: MAC ARTHUR CORPORATION
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Violation Status: No violations found

N49 **AUTO CITY SERVICE** **MI LUST** **S108896128**
SE **3465 POLLOCK RD** **MI INVENTORY** **N/A**
1/2-1 **GRAND BLANC, MI 48439**
0.745 mi.
3936 ft. **Site 1 of 2 in cluster N**

Relative:
Higher

Actual:
906 ft.

LUST:

Facility ID:	00041176
Source:	STATE OF MICHIGAN
Owner Name:	PLAN REVIEW OWNER
Owner Address:	Not Recorded
Owner City,St,Zip:	Not Recorded, xx 00000
Owner Contact:	Not reported
Owner Phone:	Not reported
Country:	USA
District:	Lansing District Office
Site Name:	Auto City Service
Latitude:	42.89386
Longitude:	-83.63894
Date of Collection:	07/26/2005
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0234-07
Release Date:	08/23/2007
Substance Released:	Unknown
Release Status:	Open
Release Closed Date:	Not reported

INVENTORY:

Bea Number:	Not reported
Township:	Not reported
District:	Lansing
Data Source:	Part 213
Latitude:	42.89386
Longitude:	-83.63894

N50 **HOLLY ROAD BP** **MI LUST** **U003425875**
SE **9291 HOLLY RD** **MI UST** **N/A**
1/2-1 **GRAND BLANC, MI 48430** **MI WDS**
0.825 mi.
4358 ft. **Site 2 of 2 in cluster N**

Relative:
Higher

Actual:
910 ft.

LUST:

Facility ID:	00005661
Source:	STATE OF MICHIGAN
Owner Name:	Auto City Service Inc
Owner Address:	14165 N Fenton Rd Ste 202
Owner City,St,Zip:	Fenton, MI 48430
Owner Contact:	Not reported
Owner Phone:	(810) 750-0300
Country:	USA
District:	Lansing District Office
Site Name:	Amoco Oil, #5869
Latitude:	42.89394
Longitude:	-83.63200

HOLLY ROAD BP (Continued) **U003425875**

Date of Collection: 05/20/2015
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Accuracy: 10
Accuracy Value Unit: METERS
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0838-90
Release Date: 05/11/1990
Substance Released: Not reported
Release Status: Closed
Release Closed Date: 05/12/1997

UST:
Facility ID: 00005661
Facility Type: ACTIVE
Owner Name: AUTO CITY SERVICE INC
Owner Address: 14165 N FENTON RD STE 202
Owner City,St,Zip: FENTON, MI 48430
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (810) 750-0300
Contact: David Leshock
Contact Phone: (810) 750-0300
Date of Collection: 05/20/2015
Accuracy: 10
Accuracy Value Unit: METERS
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Latitude: 42.89394
Longitude: -83.63200

Tank ID: 1
Tank Status: **Removed from Ground**
Capacity: 8000
Product: Gasoline
Install Date: 04/26/1966
Remove Date: 05/29/1991
Tank Release Detection: Inventory Control,Manual Tank Gauging,Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel,Lined Interier
Impressed Device: No

Tank ID: 2
Tank Status: **Removed from Ground**
Capacity: 8000
Product: Gasoline
Install Date: 04/26/1966
Remove Date: 05/29/1991
Tank Release Detection: Inventory Control,Manual Tank Gauging,Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing

HOLLY ROAD BP (Continued) **U003425875**

Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 8000
Product: Gasoline
Install Date: 04/26/1966
Remove Date: 05/29/1991
Tank Release Detection: Inventory Control,Manual Tank Gauging,Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 8000
Product: Gasoline
Install Date: 04/26/1972
Remove Date: 05/29/1991
Tank Release Detection: Inventory Control,Manual Tank Gauging,Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 5
Tank Status: Removed from Ground
Capacity: 500
Product: Used Oil
Install Date: 04/26/1966
Remove Date: 05/29/1991
Tank Release Detection: Inventory Control,Manual Tank Gauging,Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 6
Tank Status: Currently In Use
Capacity: 20000
Product: Gasoline, Diesel
Install Date: 06/01/1998
Remove Date: Not reported
Tank Release Detection: Manual Tank Gauging, Tank Tightness Testing, Inventory Control
Pipe Realease Detection: Not reported
Piping Material: TTL CONTAINMENT, Double Walled

HOLLY ROAD BP (Continued) **U003425875**

Piping Type: Pressure
Construction Material: PARMA, Double Walled
Impressed Device: No

Tank ID: 7
Tank Status: Currently In Use
Capacity: 12000
Product: Gasoline
Install Date: 06/01/1998
Remove Date: Not reported
Tank Release Detection: Automatic Tank Gauging,Inter Monitoring Double Walled Tank
Pipe Realease Detection: Automatic Line Leak Detectors,Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled,TTL CONTAINMENT
Piping Type: Pressure
Construction Material: Composite(Steel w/Fiberglass),Double Walled,PARMA
Impressed Device: No

WDS:
Site Id: MID985606391
WMD Id: 404531
Site Specific Name: AMOCO OIL CO 5869
Mailing Address: 30230 ORCHARD LAKE RD
Mailing City/State/Zip: 48334
Mailing County: OAKLAND

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51 **BUS GARAGE JEWETT TRAIL** **MI LUST** **U003425796**
NE **JEWITT TRAIL** **MI UST** **N/A**
1/2-1 **GRAND BLANC, MI 48439** **MI INVENTORY**
0.833 mi.
4399 ft.

Relative:
Lower

Actual:
850 ft.

LUST:
Facility ID: 00001176
Source: STATE OF MICHIGAN
Owner Name: Grand Blanc Comm Sch
Owner Address: 11920 S Saginaw St
Owner City,St,Zip: Grand Blanc, MI 48439-1402
Owner Contact: Not reported
Owner Phone: (810) 591-6032
Country: USA
District: Lansing District Office
Site Name: Bus Garage Jewett Trail
Latitude: 42.91853
Longitude: -83.62970
Date of Collection: 07/26/2005
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0060-13
Release Date: 05/21/2013
Substance Released: Diesel,Diesel

BUS GARAGE JEWETT TRAIL (Continued) **U003425796**

Release Status: Open
Release Closed Date: Not reported

Leak Number: C-0061-13
Release Date: 05/22/2013
Substance Released: Gasoline
Release Status: Closed
Release Closed Date: 03/21/2014

UST:
Facility ID: 00001176
Facility Type: CLOSED
Owner Name: GRAND BLANC COMM SCH
Owner Address: 11920 S SAGINAW ST
Owner City,St,Zip: GRAND BLANC, MI 48439-1402
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (810) 591-6032
Contact: James P. Adams
Contact Phone: (810) 591-6012
Date of Collection: 07/26/2005
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Latitude: 42.91853
Longitude: -83.62970

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 12000
Product: Diesel
Install Date: 02/26/1982
Remove Date: 05/21/2013
Tank Release Detection: Automatic Tank Gauging,Inter Monitoring Double Walled Tank
Pipe Realease Detection: Automatic Line Leak Detectors,Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled
Piping Type: Pressure
Construction Material: Lined Interier
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 12000
Product: Diesel
Install Date: 02/27/1979
Remove Date: 05/21/2013
Tank Release Detection: Automatic Tank Gauging,Inter Monitoring Double Walled Tank
Pipe Realease Detection: Automatic Line Leak Detectors,Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled
Piping Type: Pressure
Construction Material: Lined Interier

BUS GARAGE JEWETT TRAIL (Continued) **U003425796**

Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 5000
Product: Gasoline
Install Date: 02/27/1983
Remove Date: 05/22/2013
Tank Release Detection: Automatic Tank Gauging,Inter Monitoring Double Walled Tank
Pipe Realease Detection: Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled
Piping Type: Pressure
Construction Material: Cathodically Protected Steel
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 250
Product: Used Oil
Install Date: Not reported
Remove Date: 07/01/1992
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Gravity Fed?
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 5
Tank Status: Removed from Ground
Capacity: 250
Product: Used Oil
Install Date: Not reported
Remove Date: 07/01/1992
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Gravity Fed?
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

INVENTORY:
Bea Number: Not reported
Township: Not reported
District: Lansing
Data Source: Part 213
Latitude: 42.91854
Longitude: -83.62971

52
SE
1/2-1
0.844 mi.
4454 ft.

HOLLY 75
9311 HOLLY RD
GRAND BLANC, MI 48439

MI LUST **U000253386**
MI UST **N/A**
MI WDS

Relative:
Higher

Actual:
905 ft.

LUST:

Facility ID:	00020018
Source:	STATE OF MICHIGAN
Owner Name:	Holly 75
Owner Address:	9311 Holly Rd
Owner City,St,Zip:	Grand Blanc, MI 48439-8351
Owner Contact:	Not reported
Owner Phone:	(313) 695-4130
Country:	USA
District:	Lansing District Office
Site Name:	Holly 75
Latitude:	42.89007
Longitude:	-83.63066
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-1302-85
Release Date:	06/08/1990
Substance Released:	Not reported
Release Status:	Closed
Release Closed Date:	06/29/1998

UST:

Facility ID:	00020018
Facility Type:	CLOSED
Owner Name:	HOLLY 75
Owner Address:	9311 HOLLY RD
Owner City,St,Zip:	GRAND BLANC, MI 48439-8351
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(313) 695-4130
Contact:	MARGARET DACOSTA
Contact Phone:	(313) 695-4130
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Latitude:	42.89007
Longitude:	-83.63066
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	1000
Product:	Gasoline
Install Date:	07/01/1980

HOLLY 75 (Continued) **U000253386**

Remove Date: 06/12/1990
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 1000
Product: Diesel
Install Date: 07/01/1980
Remove Date: 06/12/1990
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

WDS:
Site Id: MID980793426
WMD Id: 399254
Site Specific Name: ASI PACKAGING CO
Mailing Address: 9311 HOLLY RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

O53 **HOLLY HILLS SUNOCO** **MI LUST** **U003834879**
ESE **9118 HOLLY RD** **MI UST** **N/A**
1/2-1 **GRAND BLANC, MI 48430** **MI INVENTORY**
0.884 mi. **MI WDS**
4666 ft. **Site 1 of 2 in cluster O**

Relative: Higher

Actual: 868 ft.

LUST:
Facility ID: 00018952
Source: STATE OF MICHIGAN
Owner Name: Auto City Service Inc
Owner Address: 14165 N Fenton Rd Ste 202
Owner City,St,Zip: Fenton, MI 48430
Owner Contact: Not reported
Owner Phone: (810) 750-0300
Country: USA
District: Lansing District Office
Site Name: Holly Hills #8
Latitude: 42.89859
Longitude: -83.63163
Date of Collection: 05/20/2015
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Accuracy: 10
Accuracy Value Unit: METERS
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

HOLLY HILLS SUNOCO (Continued) **U003834879**

Leak Number: C-0124-91
Release Date: 01/25/1991
Substance Released: Not reported
Release Status: Open
Release Closed Date: Not reported

Leak Number: C-0636-90
Release Date: 04/13/1990
Substance Released: Not reported
Release Status: Open
Release Closed Date: Not reported

UST:
Facility ID: 00018952
Facility Type: ACTIVE
Owner Name: AUTO CITY SERVICE INC
Owner Address: 14165 N FENTON RD STE 202
Owner City,St,Zip: FENTON, MI 48430
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (810) 750-0300
Contact: David Leshock
Contact Phone: (810) 750-0300
Date of Collection: 05/20/2015
Accuracy: 10
Accuracy Value Unit: METERS
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Latitude: 42.89859
Longitude: -83.63163

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 10000
Product: Gasoline
Install Date: 05/02/1981
Remove Date: 12/07/1998
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 10000
Product: Gasoline
Install Date: 05/02/1981
Remove Date: 12/07/1998
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Pressure

HOLLY HILLS SUNOCO (Continued) **U003834879**

Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 10000
Product: Gasoline
Install Date: 05/02/1981
Remove Date: 12/07/1998
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 550
Product: Used Oil
Install Date: 05/02/1981
Remove Date: 12/07/1998
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 5
Tank Status: Removed from Ground
Capacity: 12000
Product: Gasoline
Install Date: 12/08/1998
Remove Date: 04/21/2003
Tank Release Detection: Inventory Control, Interstitial Monitoring Double Walled Tank
Pipe Realease Detection: Automatic Line Leak Detectors, Line Tightness Testing
Piping Material: SW, Fiberglass Reinforced Plastic
Piping Type: Pressure
Construction Material: Fiberglass Reinforced Plastic, Double Walled
Impressed Device: No

Tank ID: 6
Tank Status: Removed from Ground
Capacity: 12000
Product: Gasoline
Install Date: 12/08/1998
Remove Date: 04/21/2003
Tank Release Detection: Inter Monitoring Double Walled Tank,Inventory Control
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing
Piping Material: Fiberglass reinforced plastic,SW
Piping Type: Pressure
Construction Material: Double Walled,Fiberglass Reinforced plastic

HOLLY HILLS SUNOCO (Continued) **U003834879**

Impressed Device: No

Tank ID: 7
Tank Status: **Currently In Use**
Capacity: 25000
Product: Gasoline
Install Date: 04/21/2003
Remove Date: Not reported
Tank Release Detection: Inventory Control, Automatic Tank Gauging, Interstitial Monitoring Double Walled Tank
Pipe Realease Detection: Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled, Flexible Piping
Piping Type: Pressure
Construction Material: Fiberglass Reinforced Plastic, Double Walled
Impressed Device: No

Tank ID: 8
Tank Status: **Currently In Use**
Capacity: 13000
Product: Gasoline, Diesel
Install Date: 04/21/2003
Remove Date: Not reported
Tank Release Detection: Inventory Control, Automatic Tank Gauging, Interstitial Monitoring Double Walled Tank
Pipe Realease Detection: Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled, Flexible Piping
Piping Type: Pressure
Construction Material: Fiberglass Reinforced Plastic, Double Walled
Impressed Device: No

INVENTORY:
Bea Number: Not reported
Township: Not reported
District: Lansing
Data Source: Part 213
Latitude: 42.89859
Longitude: -83.63163

WDS:
Site Id: MID985613827
WMD Id: 405268
Site Specific Name: SUNOCO SERVICE STATION GRAND BLANC
Mailing Address: 1801 MARKET ST
Mailing City/State/Zip: 19103
Mailing County: Not reported

O54 **HOLLY HILLS SUNOCO** **MI INVENTORY** **S114024279**
ESE **9118 HOLLY ROAD** **N/A**
1/2-1 **GRAND BLANC, MI 48439**
0.884 mi.
4666 ft. **Site 2 of 2 in cluster O**

Relative:
Higher

Actual:
868 ft.

INVENTORY:

Bea Number:	Not reported
Township:	Grand Blanc
District:	Lansing
Data Source:	Part 201
Latitude:	42.89877
Longitude:	-83.63157

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55 **DEPT OF PUBLIC WORKS** **MI LUST** **U003211098**
NNE **507 E GRAND BLANC RD** **MI UST** **N/A**
1/2-1 **GRAND BLANC, MI 48439** **MI WDS**
0.946 mi.
4997 ft.

Relative:
Lower

Actual:
843 ft.

LUST:

Facility ID:	00014803
Source:	STATE OF MICHIGAN
Owner Name:	City Of Grand Blanc
Owner Address:	200 HIGH ST
Owner City,St,Zip:	GRAND BLANC, MI 48439
Owner Contact:	Not reported
Owner Phone:	(810) 694-5420
Country:	USA
District:	Lansing District Office
Site Name:	Grand Blanc, City Of, Dpw
Latitude:	42.92357
Longitude:	-83.63479
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0083-94
Release Date:	02/01/1994
Substance Released:	Gasoline
Release Status:	Closed
Release Closed Date:	07/06/1995
Leak Number:	C-0182-94
Release Date:	03/03/1994
Substance Released:	Diesel
Release Status:	Closed
Release Closed Date:	07/06/1995
Leak Number:	C-0311-94
Release Date:	04/11/1994
Substance Released:	Used Oil
Release Status:	Closed
Release Closed Date:	07/06/1995

UST:

DEPT OF PUBLIC WORKS (Continued) **U003211098**

Facility ID:	00014803
Facility Type:	CLOSED
Owner Name:	CITY OF GRAND BLANC
Owner Address:	200 HIGH ST
Owner City,St,Zip:	GRAND BLANC, MI 48439
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(810) 694-5420
Contact:	JACK KIPP
Contact Phone:	(810) 694-5420
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Latitude:	42.92357
Longitude:	-83.63479

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	4000
Product:	Gasoline
Install Date:	03/06/1980
Remove Date:	02/01/1994
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	1000
Product:	Used Oil
Install Date:	03/06/1985
Remove Date:	02/01/1994
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device:	No

Tank ID:	3
Tank Status:	**Removed from Ground**
Capacity:	1000
Product:	Diesel
Install Date:	03/06/1980
Remove Date:	01/31/1994
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported

DEPT OF PUBLIC WORKS (Continued) **U003211098**

Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device: No

WDS:
Site Id: MI0000180976
WMD Id: 390690
Site Specific Name: CITY OF GRAND BLANC PUBLIC WORKS DEPT
Mailing Address: 507 E GRAND BLANC RD
Mailing City/State/Zip: 48439
Mailing County: GENESEE

56
North
1/2-1
0.952 mi.
5026 ft.

ROSS PROPERTIES **MI LUST** **U004066591**
G-6434 S DORT HWY **MI UST** **N/A**
GRAND BLANC, MI 33169

Relative:
Lower

Actual:
814 ft.

LUST:
Facility ID: 00041962
Source: STATE OF MICHIGAN
Owner Name: Ross Properties
Owner Address: 16805 Northwest 12th Avenue
Owner City,St,Zip: Miami, FL 33169
Owner Contact: Not reported
Owner Phone: (305) 424-9330
Country: USA
District: Lansing District Office
Site Name: Ross Properties
Latitude: 42.92916
Longitude: -83.64888
Date of Collection: 08/02/2007
Method of Collection: Interpolation-Map
Accuracy: 40
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Not reported

Leak Number: C-0005-07
Release Date: 01/10/2007
Substance Released: Unknown
Release Status: Closed
Release Closed Date: 11/24/2007

UST:
Facility ID: 00041962
Facility Type: CLOSED
Owner Name: ROSS PROPERTIES
Owner Address: 16805 NORTHWEST 12TH AVENUE
Owner City,St,Zip: MIAMI, FL 33169
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (305) 424-9330
Contact: Frank Owen
Contact Phone: (305) 757-4340
Date of Collection: 08/02/2007

ROSS PROPERTIES (Continued) **U004066591**

Accuracy:	40
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Not reported
Method of Collection:	Interpolation-Map
Latitude:	42.92916
Longitude:	-83.64888

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	4000
Product:	Diesel
Install Date:	Not reported
Remove Date:	01/10/2007
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Unknown
Impressed Device:	No

57
NNE
> 1
1.423 mi.
7512 ft.

Relative:
Lower

Actual:
818 ft.

MOTORS LIQUIDATION COMPANY **CORRACTS** **1000254412**
10800 S SAGINAW ST **MI LUST** **MID005356944**
GRAND BLANC, MI 48439 **MI UST**
MI INVENTORY
RCRA NonGen / NLR
PADS
ICIS
US AIRS
FINDS
MI AIRS
NY MANIFEST
MI WDS
ECHO

CORRACTS:

EPA ID:	MID005356944
EPA Region:	05
Area Name:	ENTIRE FACILITY
Actual Date:	20140620
Action:	CA750YE - Migration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified
NAICS Code(s):	33637 52592 333992 Motor Vehicle Metal Stamping Trusts, Estates, and Agency Accounts Welding and Soldering Equipment Manufacturing
Original schedule date:	Not reported
Schedule end date:	Not reported

EPA ID:	MID005356944
EPA Region:	05
Area Name:	ENTIRE FACILITY
Actual Date:	20120928
Action:	CA725YE - Current Human Exposures Under Control, Yes, Current Human

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Exposures Under Control has been verified
NAICS Code(s): 33637 52592 333992
Motor Vehicle Metal Stamping
Trusts, Estates, and Agency Accounts
Welding and Soldering Equipment Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

LUST:
Facility ID: 00014278
Source: STATE OF MICHIGAN
Owner Name: Cadillac Motors Car Div GMC
Owner Address: 10800 S Saginaw St
Owner City,St,Zip: Grand Blanc, MI 48439-8120
Owner Contact: Not reported
Owner Phone: (313) 234-1236
Country: USA
District: Lansing District Office
Site Name: GM - Cadillac Motor Car Division
Latitude: 42.93228
Longitude: -83.63618
Date of Collection: 01/11/2001
Method of Collection: Address Matching-House Number
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0096-85
Release Date: 12/20/1989
Substance Released: Not reported
Release Status: Closed
Release Closed Date: 10/03/1990

Leak Number: C-0751-89
Release Date: 10/27/1989
Substance Released: Not reported
Release Status: Closed
Release Closed Date: 09/14/1995

Leak Number: C-0752-89
Release Date: 10/27/1989
Substance Released: Not reported
Release Status: Closed
Release Closed Date: 10/03/1990

Leak Number: C-1179-89
Release Date: 12/12/1989
Substance Released: Not reported
Release Status: Closed
Release Closed Date: 07/12/1996

Leak Number: C-2697-90
Release Date: 12/13/1990
Substance Released: Not reported
Release Status: Closed

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Release Closed Date: 07/12/1996

UST:

Facility ID:	00014278
Facility Type:	CLOSED
Owner Name:	CADILLAC MOTORS CAR DIV GMC
Owner Address:	10800 S SAGINAW ST
Owner City,St,Zip:	GRAND BLANC, MI 48439-8120
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(313) 234-1236
Contact:	KEITH J. WILSON
Contact Phone:	(313) 234-1236
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Latitude:	42.93228
Longitude:	-83.63618

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	500
Product:	Diesel
Install Date:	05/09/1955
Remove Date:	10/14/1991
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Bare Steel,Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	200
Product:	Diesel
Install Date:	05/09/1955
Remove Date:	10/14/1991
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Bare Steel,Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

Tank ID:	3
Tank Status:	**Removed from Ground**
Capacity:	12000
Product:	NEW OIL
Install Date:	05/08/1942
Remove Date:	12/01/1989

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 12000
Product: Used Oil
Install Date: 05/08/1942
Remove Date: 12/01/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 5
Tank Status: Removed from Ground
Capacity: 12000
Product: Used Oil
Install Date: 05/08/1942
Remove Date: 12/01/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 6
Tank Status: Removed from Ground
Capacity: 30000
Product: Diesel
Install Date: 05/08/1942
Remove Date: 12/01/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 7
Tank Status: Removed from Ground
Capacity: 30000
Product: Used Oil
Install Date: 05/08/1942
Remove Date: 12/01/1989
Tank Release Detection: Not reported

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 8
Tank Status: Removed from Ground
Capacity: 30000
Product: Used Oil
Install Date: 05/08/1942
Remove Date: 12/01/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 9
Tank Status: Removed from Ground
Capacity: 2000
Product: Gasoline
Install Date: 05/08/1942
Remove Date: 12/01/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 10
Tank Status: Removed from Ground
Capacity: 2000
Product: Gasoline
Install Date: 05/08/1942
Remove Date: 12/01/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 11
Tank Status: Removed from Ground
Capacity: 2000
Product: Gasoline
Install Date: 05/08/1980
Remove Date: 10/14/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 12
Tank Status: Removed from Ground
Capacity: 5000
Product: Used Oil
Install Date: 05/09/1971
Remove Date: 08/03/1988
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 13
Tank Status: Removed from Ground
Capacity: 5000
Product: Used Oil
Install Date: 05/09/1971
Remove Date: 08/03/1988
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 14
Tank Status: Removed from Ground
Capacity: 5000
Product: Used Oil
Install Date: 05/09/1971
Remove Date: 08/03/1988
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

INVENTORY:
Bea Number: Not reported
Township: Not reported
District: Lansing
Data Source: Part 213
Latitude: 42.93229
Longitude: -83.63618

RCRA NonGen / NLR:

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Date form received by agency: 03/30/2011
Facility name: MOTORS LIQUIDATION COMPANY
Facility address: 10800 S SAGINAW ST
GRAND BLANC, MI 48439
EPA ID: MID005356944
Mailing address: 401 S OLD WOODWARD AVE
STE 370 ATTN R HARE
BIRMINGHAM, MI 48009
Contact: ROBERT HARE
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: (248) 225-3277
Contact email: RHARE@ALIXPARTNERS.COM
EPA Region: 05
Land type: Other land type
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/01/2010
Owner/Op end date: Not reported

Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/01/2010
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

. Waste code: D001
. Waste name: IGNITABLE WASTE

Historical Generators:
Date form received by agency: 07/10/2009
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 06/09/2009
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 07/20/2006
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 06/01/2006
Site name: MOTORS LIQUIDATION COMPANY
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 03/13/2006
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 07/16/2002
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 12/01/2000
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 11/01/2000
Site name: MOTORS LIQUIDATION COMPANY
Classification: Large Quantity Generator

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 05/14/1999
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 02/27/1998
Site name: METAL FABRICATION DIVISION, GMC
Classification: Large Quantity Generator

Date form received by agency: 02/16/1996
Site name: METAL FABRICATING DIV, GMC GRAND BLANC
Classification: Large Quantity Generator

Date form received by agency: 02/24/1994
Site name: GMC, CADILLAC-GRAND BLANC
Classification: Large Quantity Generator

Date form received by agency: 03/10/1992
Site name: CADILLAC MOTOR CAR DIV/GMC GRAND BLANC
Classification: Large Quantity Generator

Date form received by agency: 03/30/1990
Site name: CADILLAC MOTOR CAR DIV. GMC GRAND BLANC
Classification: Large Quantity Generator

Date form received by agency: 11/19/1980
Site name: MOTORS LIQUIDATION COMPANY
Classification: Not a generator, verified

. Waste code: D001
. Waste name: IGNITABLE WASTE

Date form received by agency: 08/15/1980
Site name: MOTORS LIQUIDATION COMPANY
Classification: Small Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE WASTE

Corrective Action Summary:
Event date: 09/28/2012
Event: Current Human Exposures under Control, Yes, Current Human Exposures Under Control has been verified. Based on a review of information contained in the EI determination, current human exposures are expected to be under control at the facility under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

Event date: 06/20/2014
Event: Igration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified. Based on a

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 09/01/1995
Date achieved compliance: 06/20/1996
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/01/1995
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 02/08/1991
Date achieved compliance: 12/05/1991
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/15/1991
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 05/25/1988
Date achieved compliance: 08/29/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 06/15/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 04/09/1987
Date achieved compliance: 05/07/1987
Violation lead agency: State

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/16/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 06/18/1996
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Generators - General
Date achieved compliance: 06/20/1996
Evaluation lead agency: State

Evaluation date: 08/10/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 06/20/1996
Evaluation lead agency: State

Evaluation date: 02/05/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/12/1991
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 02/08/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 12/05/1991
Evaluation lead agency: State

Evaluation date: 10/03/1989
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/29/1988
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/01/1988
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Evaluation date: 05/25/1988
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 08/29/1988
Evaluation lead agency: State

Evaluation date: 05/07/1987
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 04/09/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 05/07/1987
Evaluation lead agency: State

Evaluation date: 04/17/1986
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 04/18/1985
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

PADS:
EPAID: MID005356944
Facility name: GENERAL MOTORS GRAND BLANC
Facility Address: 10800 S SAGINAW ST
GRAND BLANC, MI 48439-7698
Facility country: US
Generator: Yes
Storer: No
Transporter: No
Disposer: No
Research facility: No
Smelter: No
Facility owner name: GENERAL MOTORS CORP
Contact title: Not reported
Contact name: WILSON KEITH J
Contact tel: (313)234-1236
Contact extension: Not reported
Mailing address: 10800 S SAGINAW ST
GRAND BLANC, MI 48439-7698
Mailing country: US
Cert. title: Not reported
Cert. name: Not reported
Cert. date: 04/03/1990
Date received: 05/22/1990

ICIS:
Enforcement Action ID: 05-2011-9941

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

FRS ID: 110044973286
Program ID: RCRAINFO MID005356944
Action Name: RACER TRUST - DORT HIGHWAY [EXECUTED PERFORMANCE-BASED VOLUNTARY AGREEMENT]
Full Address: 10800 S SAGINAW ST GRAND BLANC MI 48439
State: Michigan
Facility Name: MOTORS LIQUIDATION COMPANY
Facility Address: 10800 S SAGINAW ST
GRAND BLANC, MI 48439
Enforcement Action Type: RCRA 3008H AO For Corrective Action
Facility County: GENESEE
EPA Region #: 5

Enforcement Action ID: 05-2011-9941
FRS ID: 110044973286
Program ID: FRS 110044973286
Action Name: RACER TRUST - DORT HIGHWAY [EXECUTED PERFORMANCE-BASED VOLUNTARY AGREEMENT]
Full Address: 10800 S SAGINAW ST GRAND BLANC MI 48439
State: Michigan
Facility Name: MOTORS LIQUIDATION COMPANY
Facility Address: 10800 S SAGINAW ST
GRAND BLANC, MI 48439
Enforcement Action Type: RCRA 3008H AO For Corrective Action
Facility County: GENESEE
EPA Region #: 5

Program ID: FRS 110044973286
Facility Name: MOTORS LIQUIDATION COMPANY
Address: 10800 S SAGINAW ST
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: Not reported

Program ID: RCRAINFO MID005356944
Facility Name: MOTORS LIQUIDATION COMPANY
Address: 10800 S SAGINAW ST
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: Not reported

US AIRS MINOR:
Envid: 1000254412
Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
D and B Number: Not reported
Primary SIC Code: 3465
NAICS Code: 336370
Default Air Classification Code: MIN
Facility Type of Ownership Code: POF
Air CMS Category Code: TVM
HPV Status: Not reported

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

US AIRS MINOR:

Region Code:	05
Programmatic ID:	AIR MI00000000000B1610
Facility Registry ID:	110041159091
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	CFC Tracking (CAA Title VI)
Activity Date:	2004-06-09 00:00:00
Activity Status Date:	Not reported
Activity Group:	Compliance Monitoring
Activity Type:	Information Request
Activity Status:	Not reported

Region Code:	05
Programmatic ID:	AIR MI00000000000B1610
Facility Registry ID:	110041159091
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	CFC Tracking (CAA Title VI)
Activity Date:	2005-09-22 00:00:00
Activity Status Date:	Not reported
Activity Group:	Compliance Monitoring
Activity Type:	Inspection/Evaluation
Activity Status:	Not reported

Region Code:	05
Programmatic ID:	AIR MI00000000000B1610
Facility Registry ID:	110041159091
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	MACT Standards (40 CFR Part 63)
Activity Date:	2007-09-18 00:00:00
Activity Status Date:	Not reported
Activity Group:	Compliance Monitoring
Activity Type:	Inspection/Evaluation
Activity Status:	Not reported

Region Code:	05
Programmatic ID:	AIR MI00000000000B1610
Facility Registry ID:	110041159091
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	MACT Standards (40 CFR Part 63)
Activity Date:	2007-11-20 00:00:00
Activity Status Date:	Not reported
Activity Group:	Compliance Monitoring
Activity Type:	Inspection/Evaluation
Activity Status:	Not reported

Region Code:	05
Programmatic ID:	AIR MI00000000000B1610
Facility Registry ID:	110041159091
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	MACT Standards (40 CFR Part 63)
Activity Date:	2008-03-11 00:00:00
Activity Status Date:	Not reported

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: MACT Standards (40 CFR Part 63)
Activity Date: 2008-03-13 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: MACT Standards (40 CFR Part 63)
Activity Date: 2008-03-17 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: MACT Standards (40 CFR Part 63)
Activity Date: 2008-03-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: MACT Standards (40 CFR Part 63)
Activity Date: 2010-03-18 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Air Program: MACT Standards (40 CFR Part 63)
Activity Date: 2010-03-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2007-09-18 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2007-11-20 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2008-03-11 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2008-03-13 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2008-03-17 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2008-03-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2010-03-18 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: New Source Performance Standards
Activity Date: 2010-03-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: Not reported
Activity Status Date: 1993-01-07 00:00:00
Activity Group: Case File
Activity Type: Case File
Activity Status: Resolved

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: Not reported
Activity Status Date: 2003-05-08 00:00:00
Activity Group: Case File
Activity Type: Case File
Activity Status: Resolved

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: Not reported
Activity Status Date: 2008-04-16 00:00:00
Activity Group: Case File
Activity Type: Case File
Activity Status: Resolved

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1981-06-30 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1982-12-31 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1983-09-30 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1984-05-16 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1985-08-29 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1986-09-17 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1987-02-19 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Activity Date: 1987-09-15 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1989-07-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1990-05-03 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1991-02-15 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1992-03-04 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1994-01-05 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1996-05-14 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1997-07-02 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1998-01-13 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1999-08-17 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1999-12-15 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2001-11-07 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2002-11-07 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2007-09-18 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2007-11-20 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2008-03-11 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2008-03-13 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2008-03-17 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2008-03-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Activity Date: 2010-03-18 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2010-03-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2002-01-23 00:00:00
Activity Status Date: 2002-01-23 00:00:00
Activity Group: Enforcement Action
Activity Type: Administrative - Formal
Activity Status: Final Order Issued

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2005-12-07 00:00:00
Activity Status Date: 2005-12-07 00:00:00
Activity Group: Enforcement Action
Activity Type: Administrative - Formal
Activity Status: Final Order Issued

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 1990-05-22 00:00:00
Activity Status Date: 1990-05-22 00:00:00
Activity Group: Enforcement Action
Activity Type: Administrative - Informal
Activity Status: Achieved

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2002-11-15 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2003-11-15 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2004-11-09 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2006-02-13 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2006-11-20 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2008-03-17 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2008-03-18 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2009-03-16 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2009-03-23 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2010-03-15 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2010-03-18 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 05
Programmatic ID: AIR MI00000000000B1610
Facility Registry ID: 110041159091
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: Title V Permits
Activity Date: 2010-03-25 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

FINDS:

Registry ID: 110044973286

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

AIRS:
State Registration Number: B1610
Naics Code: Not reported
Contact Name: Not reported
Contact Phone: Not reported
Contact Address: Not reported
Contact City,St,Zip: Not reported
Permit Number: 51-79
Date Received: 02/05/1979
Application Reason: BOAT MFG'R.
Record Type: Not reported
State County FIPS: Not reported
Facility Category: Not reported
SIC Primary: Not reported
Tribal Code: Not reported

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Facility Status:	Not reported
Supplemental Location Text:	Not reported
Business Name:	Not reported
Principal Product:	Not reported
Principal Product Description:	Not reported
UTM Zone (Geo Coordinates Universal Transverse Mercator System):	Not reported
UTM Horizontal Coord:	Not reported
UTM Vertical Coord:	Not reported
Mailing Name:	Not reported
Mailing Contact Person:	Not reported
Mailing Street:	Not reported
Mailing City:	Not reported
Mailing State:	Not reported
Mailing Zip:	Not reported
Mailing Zip 4 Extension:	Not reported
Compliance Person:	Not reported
Compliance Area Code:	Not reported
Compliance Phone Number:	Not reported
Emission Inventory Contact Person:	Not reported
EI Contact Area Code:	Not reported
EI Contact Phone Number:	Not reported
Permit Contact Person:	Not reported
Permit Contact Person Area Code:	Not reported
Permit Contact Person Phone Number:	Not reported
Federal Employer Id Number:	Not reported
# Of Employees:	Not reported
Reporting Year:	Not reported
Date Record Was Created:	Not reported

NY MANIFEST:

EPA ID:	MID005356944
Country:	USA
Location Address 1:	10800 SOUTH SAGINAW STREET
Location Address 2:	Not reported
Location City:	GRAND BLANC
Location State:	MI
Location Zip Code:	48439
Location Zip Code 4:	Not reported

Mailing Info:

Name:	GENERAL MOTORS CORP
Contact:	ELDON L HARDENBURG
Address:	10800 SOUTH SAGINAW STREET
City/State/Zip:	GRAND BLANC, MI 48439
Country:	USA
Phone:	313-234-1228

Manifest:

Document ID:	NYB9556695
Manifest Status:	Not reported
Trans1 State ID:	TLL3374OH
Trans2 State ID:	Not reported
Generator Ship Date:	08/27/2003
Trans1 Recv Date:	08/27/2003
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	08/28/2003

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MID005356944
Trans1 EPA ID:	OHD068913409
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	B007 - OTHER MISCELLANEOUS PCB WASTES
Quantity:	02005
Units:	K - Kilograms (2.2 pounds)
Number of Containers:	001
Container Type:	CM - Metal boxes, cases, roll-offs
Handling Method:	L Landfill.
Specific Gravity:	01.00
Year:	2003

Document ID:	NYB9523278
Manifest Status:	Not reported
Trans1 State ID:	TML8564OH
Trans2 State ID:	Not reported
Generator Ship Date:	05/15/2003
Trans1 Recv Date:	05/15/2003
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	05/16/2003
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MID005356944
Trans1 EPA ID:	OHD068913409
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	B007 - OTHER MISCELLANEOUS PCB WASTES
Quantity:	01842
Units:	K - Kilograms (2.2 pounds)
Number of Containers:	001
Container Type:	CM - Metal boxes, cases, roll-offs
Handling Method:	L Landfill.
Specific Gravity:	01.00
Year:	2003

Document ID:	NYG0047601
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	HQ89783OR
Trans2 State ID:	Not reported
Generator Ship Date:	08/13/1997
Trans1 Recv Date:	08/13/1997
Trans2 Recv Date:	/ /
TSD Site Recv Date:	08/22/1997
Part A Recv Date:	09/16/1997
Part B Recv Date:	09/11/1997
Generator EPA ID:	MID005356944
Trans1 EPA ID:	MOD095038998
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	D009 - MERCURY 0.2 MG/L TCLP
Quantity:	00165
Units:	G - Gallons (liquids only)* (8.3 pounds)

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Number of Containers: 003
Container Type: DM - Metal drums, barrels
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 100
Waste Code: B005 - PCB ARTICLES WITH 500 PPM OR > PCB
Quantity: 00853
Units: K - Kilograms (2.2 pounds)
Number of Containers: 004
Container Type: DM - Metal drums, barrels
Handling Method: B Incineration, heat recovery, burning.
Specific Gravity: 100
Year: 1997

Document ID: NYB9523242
Manifest Status: Not reported
Trans1 State ID: PUR8994OH
Trans2 State ID: Not reported
Generator Ship Date: 07/12/2002
Trans1 Recv Date: 07/12/2002
Trans2 Recv Date: Not reported
TSD Site Recv Date: 07/15/2002
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MID005356944
Trans1 EPA ID: OHD068913409
Trans2 EPA ID: Not reported
TSDF ID: NYD049836679
Waste Code: B007 - OTHER MISCELLANEOUS PCB WASTES
Quantity: 02096
Units: K - Kilograms (2.2 pounds)
Number of Containers: 001
Container Type: CM - Metal boxes, cases, roll-offs
Handling Method: L Landfill.
Specific Gravity: 01.00
Year: 2002

Document ID: NYB9570402
Manifest Status: Not reported
Trans1 State ID: OHD068913409
Trans2 State ID: Not reported
Generator Ship Date: 02/08/2005
Trans1 Recv Date: 02/08/2005
Trans2 Recv Date: Not reported
TSD Site Recv Date: 02/09/2005
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MID005356944
Trans1 EPA ID: T117060TN
Trans2 EPA ID: Not reported
TSDF ID: NYD049836679
Waste Code: D008 - LEAD 5.0 MG/L TCLP
Quantity: 00660
Units: P - Pounds
Number of Containers: 012
Container Type: DM - Metal drums, barrels

MOTORS LIQUIDATION COMPANY (Continued) **1000254412**

Handling Method: L Landfill.
Specific Gravity: 01.00
Year: 2005

WDS:
Site Id: MID005356944
WMD Id: 393438
Site Specific Name: FORMERLY GRAND BLANC WELD TOOL CENTER
Mailing Address: 401 S OLD WOODWARD AVE
Mailing City/State/Zip: 48009
Mailing County: OAKLAND

Site Id: MIK882475114
WMD Id: 422959
Site Specific Name: CSX TRANSPORTATION INC
Mailing Address: 500 W WATER ST
Mailing City/State/Zip: 32202
Mailing County: Not reported

Site Id: MIK882123342
WMD Id: 486771
Site Specific Name: GM GRAND BLANC
Mailing Address: 10800 S SAGINAW ST
Mailing City/State/Zip: 48439
Mailing County: GENESEE

ECHO:
Envid: 1000254412
Registry ID: 110044973286
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110044973286

Count: 35 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BURTON	S111120912	4057 AND 4085 SOUTH DORT HIGHWAY	4057 AND 4085 SOUTH DORT HIGHW	48439	MI BEA
GENESEE COUNTY	S114035188	G-5107 NORTH DORT HIGHWAY	(SLC GENESEE RECYCLING INDUSTR		MI INVENTORY
GENESEE COUNTY	S114025684	3701 AND 3751 S. DORT HWY	3701 & 3751 S. DORT HWY		MI INVENTORY
GENESEE COUNTY	S114026521	4315 & 4349 S. DORT HIGHWAY	4315 & 4349 S. DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114025683	3701 AND 3751 S. DORT HIGHWAY	3701 AND 3751 S. DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114023031	1512 AND 1514 S. DORT HWY.	1512 AND 1514 S. DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114026110	4057 AND 4085 SOUTH DORT HIGHWAY	4057 AND 4085 SOUTH DORT HIGHW	48439	MI INVENTORY
GENESEE COUNTY	S114027585	5130 AND 5122 NORTH DORT HIGHWAY	5130 AND 5122 NORTH DORT HIGHW		MI INVENTORY
GENESEE COUNTY	S114023508	2.7 ACRES NE CORNER N. DORT HWY/DA	NE CORNER N. DORT HWY/DAVISON		MI INVENTORY
GENESEE COUNTY	S114021737	0.619 ACRES NE CORNER OF N.DORT HW	NE CORNER OF N.DORT HWY/DAVISO		MI INVENTORY
GENESEE COUNTY	S114023636	2010 NORTH DORT HWY, PARCEL B	2010 NORTH DORT HWY		MI INVENTORY
GENESEE COUNTY	S114022858	1419 N. DORT HWY.	1419 N. DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114032145	902 SOUTH DORT HIGHWAY	902 SOUTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114030670	810 SOUTH DORT HIGHWAY	810 S. DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114023705	2060 S. DORT HWY.	2060 S. DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114024394	2525 SOUTH DORT HIGHWAY	2525 SOUTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114021869	10098 NORTH DORT HIGHWAY	10098 NORTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114035193	G-5150 DORT HIGHWAY	G-5150 DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114027600	5167 NORTH DORT HIGHWAY	5167 NORTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114030071	7365 N. DORT HIGHWAY	7365 N. DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114021868	10092 NORTH DORT HIGHWAY	10092 NORTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114023343	1801 S. DORT HIGHWAY	1801 S. DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114027826	5443 S. DORT HWY.	5443 S. DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114029382	6312 NORTH DORT HIGHWAY	6312 NORTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114023789	2102 S. DORT HWY.	2102 S. DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114025395	3302 SOUTH DORT HIGHWAY	3302 SOUTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114025394	3302 S. DORT HIGHWAY	3302 S. DORT HWY		MI INVENTORY
GENESEE COUNTY	S114023273	1733 N. DORT HIGHWAY	1733 N. DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114026076	4012 NORTH DORT HIGHWAY	4012 N. DORT		MI INVENTORY
GENESEE COUNTY	S114035191	G-5135, G-5145 & G-5155 NORTH DORT	G-5135, G-5145 & G-5155 NORTH		MI INVENTORY
GENESEE COUNTY	S114035190	G-5107 NORTH DORT HWY	G-5107 NORTH DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114035198	G-5395 NORTH DORT HIGHWAY	G-5395 NORTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114035206	G-8010 NORTH DORT HIGHWAY	G-8010 NORTH DORT HIGHWAY		MI INVENTORY
GENESEE COUNTY	S114035189	G-5107 NORTH DORT HWY.	G-5107 NORTH DORT HWY.		MI INVENTORY
GENESEE COUNTY	S114035177	G-3509 SOUTH DORT HIGHWAY	G-3509 SOUTH DORT HIGHWAY		MI INVENTORY

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/13/2015
Date Data Arrived at EDR: 01/06/2016
Date Made Active in Reports: 05/20/2016
Number of Days to Update: 135

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/08/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/05/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2015
Date Data Arrived at EDR: 05/29/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 13

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/16/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/28/2016
Date Data Arrived at EDR: 03/30/2016
Date Made Active in Reports: 05/20/2016
Number of Days to Update: 51

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

Date of Government Version: N/A
Date Data Arrived at EDR: 10/31/2013
Date Made Active in Reports: 11/20/2013
Number of Days to Update: 20

Source: Dept of Environmental Quality
Telephone: 517-284-5103
Last EDR Contact: 04/21/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: No Update Planned

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Facilities Database

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/28/2016
Date Data Arrived at EDR: 03/30/2016
Date Made Active in Reports: 05/05/2016
Number of Days to Update: 36

Source: Dept of Environmental Quality
Telephone: 517-335-4035
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Semi-Annually

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Sites

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 02/01/2016
Date Data Arrived at EDR: 02/18/2016
Date Made Active in Reports: 04/04/2016
Number of Days to Update: 46

Source: Dept of Environmental Quality
Telephone: 517-373-9837
Last EDR Contact: 05/18/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Annually

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/17/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 02/05/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 35
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Semi-Annually

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 12/11/2015
Date Data Arrived at EDR: 02/19/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 105
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/27/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 02/25/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/09/2015
Date Data Arrived at EDR: 02/12/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 112
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

State and tribal registered storage tank lists

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/11/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Varies

UST 2: Underground Storage Tank Listing
A listing of underground storage tank site locations that have unknown owner information.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 04/04/2016
Number of Days to Update: 68
Source: Dept of Environmental Quality
Telephone: 517-241-8847
Last EDR Contact: 05/16/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Annually

UST: Underground Storage Tank Facility List
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/03/2015
Date Data Arrived at EDR: 11/18/2015
Date Made Active in Reports: 12/22/2015
Number of Days to Update: 34
Source: Dept of Environmental Quality
Telephone: 517-241-8847
Last EDR Contact: 05/18/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Annually

AST: Aboveground Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 03/09/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 05/05/2016
Number of Days to Update: 30
Source: Dept of Environmental Quality
Telephone: 517-241-8847
Last EDR Contact: 05/16/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: No Update Planned

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 02/05/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 35
Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/05/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 12/03/2015
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 120

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 01/26/2016
Date Data Arrived at EDR: 02/05/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 119

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 02/25/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/29/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

State and tribal institutional control / engineering control registries

AUL: Engineering and Institutional Controls
A listing of sites with institutional and/or engineering controls in place.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 03/08/2016
Date Made Active in Reports: 05/05/2016
Number of Days to Update: 58

Source: Dept of Environmental Quality
Telephone: 517-373-4828
Last EDR Contact: 05/31/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/01/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields and USTfield Site Database
All state funded Part 201 and 213 sites, as well as LUST sites that have been redeveloped by private entities using the BEA process. Be aware that this is not a list of all of the potential brownfield sites in Michigan.

Date of Government Version: 01/15/2016
Date Data Arrived at EDR: 02/02/2016
Date Made Active in Reports: 04/04/2016
Number of Days to Update: 62

Source: Dept of Environmental Quality
Telephone: 517-373-4805
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

BROWNFIELDS 2: Brownfields Building and Land Site Locations
A listing of brownfield building and land site locations. The listing is a collaborative effort of Michigan Economic Development Corporation, Michigan Economic Developers Association, Detrot Edison, Detroit Area Commercial Board of Realtors

Date of Government Version: 04/09/2007
Date Data Arrived at EDR: 04/10/2007
Date Made Active in Reports: 05/01/2007
Number of Days to Update: 21

Source: Economic Development Corporation
Telephone: 888-522-0103
Last EDR Contact: 05/27/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/22/2015
Date Data Arrived at EDR: 12/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/22/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: Recycling Facilities
A listing of recycling center locations.

Date of Government Version: 03/31/2016
Date Data Arrived at EDR: 04/01/2016
Date Made Active in Reports: 05/05/2016
Number of Days to Update: 34

Source: Dept of Environmental Quality
Telephone: 517-241-5719
Last EDR Contact: 03/28/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

HIST LF: Inactive Solid Waste Facilities
The database contains historical information and is no longer updated.

Date of Government Version: 03/01/1997
Date Data Arrived at EDR: 02/28/2003
Date Made Active in Reports: 03/06/2003
Number of Days to Update: 6

Source: Dept of Environmental Quality
Telephone: 517-335-4034
Last EDR Contact: 02/28/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/21/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 02/18/2016
Date Data Arrived at EDR: 03/07/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 88

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

PART 201: Part 201 Site List

A Part 201 Listed site is a location that has been evaluated and scored by the DEQ using the Part 201 scoring model. The location is or includes a "facility" as defined by Part 201, where there has been a release of a hazardous substance(s) in excess of the Part 201 residential criteria, and/or where corrective actions have not been completed under Part 201 to meet the applicable cleanup criteria for unrestricted residential use. The Part 201 List does not include all of the sites of contamination that are subject to regulation under Part 201 because owners are not required to inform the DEQ about the sites and can pursue cleanup independently. Sites of environmental contamination that are not known to DEQ are not on the list, nor are sites with releases that resulted in low environmental impact.

Date of Government Version: 10/01/2013
Date Data Arrived at EDR: 10/03/2014
Date Made Active in Reports: 10/03/2014
Number of Days to Update: 0

Source: Department of Environmental Quality
Telephone: 517-284-5103
Last EDR Contact: 04/21/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: No Update Planned

INVENTORY: Inventory of Facilities

The Inventory of Facilities has three data sources: Facilities under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) identified through state funded or private party response activities (Projects); Facilities under Part 213, Leaking Underground Storage Tanks of the NREPA; and Facilities identified through submittals of Baseline Environmental Assessments (BEA) submitted pursuant to Part 201 or Part 213 of the NREPA. The Part 201 Projects Inventory does not include all of the facilities that are subject to regulation under Part 201 because owners are not required to inform the Department of Environmental Quality (DEQ) about the facilities and can pursue cleanup independently. Facilities that are not known to DEQ are not on the Inventory, nor are locations with releases that resulted in low environmental impact. Part 213 facilities listed here may have more than one release; a list of releases for which corrective actions have been completed and list of releases for which corrective action has not been completed is located on the Leaking Underground Storage Tanks Site Search webpage. The DEQ may or may not have reviewed and concurred with the conclusion that the corrective actions described in a closure report meets criteria. A BEA is a document that new or prospective property owners/operations disclose to the DEQ identifying the property as a facility pursuant to Part 201 and Part 213. The Inventory of BEA Facilities overlaps in part with the Part 201 Projects facilities and Part 213 facilities. There may be more than one BEA for each facility.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/28/2016
Date Made Active in Reports: 04/04/2016
Number of Days to Update: 67

Source: Department of Environmental Quality
Telephone: 517-284-5136
Last EDR Contact: 04/27/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Quarterly

CDL: Clandestine Drug Lab Listing

A listing of clandestine drug lab locations.

Date of Government Version: 11/30/2015
Date Data Arrived at EDR: 02/16/2016
Date Made Active in Reports: 04/07/2016
Number of Days to Update: 51

Source: Department of Community Health
Telephone: 517-373-3740
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

DEL PART 201: Delisted List of Contaminated Sites

A deleted site has been removed from the Part 201 List because information known to the DEQ at the time of the evaluation does not support inclusion on the Part 201 List. This designation is often applied to sites where changes in cleanup criteria resulted in a determination that the site no longer exceeds any applicable cleanup criterion.
A delisted site has been removed from the Part 201 List because response actions have reduced the levels of contaminants to concentrations which meet or are below the criteria for unrestricted residential use.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 09/11/2013
Number of Days to Update: 41

Source: Dept of Environmental Quality
Telephone: 517-373-9541
Last EDR Contact: 04/21/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/18/2016
Date Data Arrived at EDR: 03/07/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 88

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/31/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Quarterly

Local Land Records

LIENS: Lien List

An Environmental Lien is a charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon a property, including (but not limited to) liens imposed pursuant to CERCLA 42 USC * 9607(1) and similar state or local laws. In other words: a lien placed upon a property's title due to an environmental condition

Date of Government Version: 07/07/2015
Date Data Arrived at EDR: 07/24/2015
Date Made Active in Reports: 08/05/2015
Number of Days to Update: 12

Source: Dept of Environmental Quality
Telephone: 517-241-7603
Last EDR Contact: 04/22/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/02/2015
Number of Days to Update: 68

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

PEAS: Pollution Emergency Alerting System

Environmental pollution emergencies reported to the Department of Environmental Quality such as tanker accidents, pipeline breaks, and release of reportable quantities of hazardous substances.

Date of Government Version: 02/29/2016
Date Data Arrived at EDR: 03/03/2016
Date Made Active in Reports: 05/19/2016
Number of Days to Update: 77

Source: Dept of Environmental Quality
Telephone: 517-373-8427
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/30/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/11/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/15/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/15/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/20/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/01/2015
Date Data Arrived at EDR: 09/03/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 05/18/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/09/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/12/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 133

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/24/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/08/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2015
Date Data Arrived at EDR: 08/26/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/25/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 05/12/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 33
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/12/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 31
Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/08/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 05/20/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 05/20/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 03/18/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 28
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 05/06/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 04/15/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/11/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 04/26/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/07/2015
Date Data Arrived at EDR: 07/09/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/08/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/04/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 46

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 05/27/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/15/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/11/2016
Date Data Arrived at EDR: 03/15/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 80

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 05/09/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/23/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/07/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/09/2016
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 44

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/02/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 06/03/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 06/03/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/20/2015
Date Data Arrived at EDR: 09/09/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 55

Source: EPA
Telephone: (312) 353-2000
Last EDR Contact: 03/08/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2015
Date Data Arrived at EDR: 01/29/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 67

Source: Department of Defense
Telephone: 571-373-0407
Last EDR Contact: 04/18/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 03/01/2016
Date Data Arrived at EDR: 03/03/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/12/2016
Data Release Frequency: Varies

AIRS: Permit and Emissions Inventory Data

Permit and emissions inventory data.

Date of Government Version: 03/23/2016
Date Data Arrived at EDR: 03/24/2016
Date Made Active in Reports: 04/20/2016
Number of Days to Update: 27

Source: Dept of Environmental Quality
Telephone: 517-373-7074
Last EDR Contact: 03/21/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

BEA: Baseline Environmental Assessment Database

A BEA is a document that new or prospective property owners/operations disclose to the DEQ identifying the property as a facility pursuant to Part 201 and Part 213. The Inventory of BEA Facilities overlaps in part with the Part 201 Projects facilities and Part 213 facilities. There may be more than one BEA for each facility.

Date of Government Version: 08/21/2013
Date Data Arrived at EDR: 08/23/2013
Date Made Active in Reports: 09/12/2013
Number of Days to Update: 20

Source: Dept of Environmental Quality
Telephone: 517-373-9541
Last EDR Contact: 05/13/2016
Next Scheduled EDR Contact: 08/22/2016
Data Release Frequency: No Update Planned

COAL ASH: Coal Ash Disposal Sites

Coal fired power plants in Southeast Michigan that have coal ash handling on site.

Date of Government Version: 10/15/2014
Date Data Arrived at EDR: 10/16/2014
Date Made Active in Reports: 11/26/2014
Number of Days to Update: 41

Source: Dept of Environmental Quality
Telephone: 586-753-3754
Last EDR Contact: 05/02/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Varies

DRYCLEANERS: Drycleaning Establishments

A listing of drycleaning facilities in Michigan.

Date of Government Version: 01/26/2016
Date Data Arrived at EDR: 01/29/2016
Date Made Active in Reports: 04/01/2016
Number of Days to Update: 63

Source: Dept of Environmental Quality
Telephone: 517-335-4586
Last EDR Contact: 04/18/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Annually

Financial Assurance 1: Financial Assurance Information Listing

Financial assurance information.

Date of Government Version: 02/10/2016
Date Data Arrived at EDR: 02/12/2016
Date Made Active in Reports: 04/04/2016
Number of Days to Update: 52

Source: Dept of Environmental Quality
Telephone: 517-335-6610
Last EDR Contact: 04/04/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 01/05/2011
Date Data Arrived at EDR: 01/07/2011
Date Made Active in Reports: 02/14/2011
Number of Days to Update: 38

Source: Dept of Environmental Quality
Telephone: 517-335-4034
Last EDR Contact: 03/28/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

LEAD CERT: Lead Safe Housing Registry

A listing of Michigan properties included in the Lead Safe Housing Registry.

Date of Government Version: 09/15/2015
Date Data Arrived at EDR: 09/16/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 14

Source: Department of Community Health
Telephone: 517-335-9699
Last EDR Contact: 03/04/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Quarterly

NPDES: List of Active NPDES Permits

General information regarding NPDES (National Pollutant Discharge Elimination System) permits and NPDES Storm Water permits.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/07/2016
Date Made Active in Reports: 05/05/2016
Number of Days to Update: 28

Source: Dept of Environmental Quality
Telephone: 517-241-1300
Last EDR Contact: 04/07/2016
Next Scheduled EDR Contact: 07/18/2016
Data Release Frequency: Varies

UIC: Underground Injection Wells Database
A listing of underground injection well locations. The UIC Program is responsible for regulating the construction, operation, permitting, and closure of injection wells that place fluids underground for storage or disposal.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 04/07/2016
Number of Days to Update: 71

Source: Dept of Environmental Quality
Telephone: 517-241-1515
Last EDR Contact: 05/09/2016
Next Scheduled EDR Contact: 08/08/2016
Data Release Frequency: Varies

WDS: Waste Data System
The Waste Data System (WDS) tracks activities at facilities regulated by the Solid Waste, Scrap Tire, Hazardous Waste, and Liquid Industrial Waste programs.

Date of Government Version: 02/26/2016
Date Data Arrived at EDR: 03/01/2016
Date Made Active in Reports: 04/04/2016
Number of Days to Update: 34

Source: Dept of Environmental Quality
Telephone: 517-284-6562
Last EDR Contact: 05/23/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/22/2016
Date Data Arrived at EDR: 02/24/2016
Date Made Active in Reports: 05/20/2016
Number of Days to Update: 86

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/25/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/20/2015
Date Data Arrived at EDR: 09/23/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 103

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 03/23/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historic Gas Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA PART 201: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Michigan.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/24/2013
Number of Days to Update: 176

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Michigan.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Michigan.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/24/2013
Number of Days to Update: 176

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/13/2016
Next Scheduled EDR Contact: 08/29/2016
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/17/2015
Date Made Active in Reports: 08/12/2015
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/12/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 02/01/2016
Date Data Arrived at EDR: 02/03/2016
Date Made Active in Reports: 03/22/2016
Number of Days to Update: 48

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/06/2016
Next Scheduled EDR Contact: 08/15/2016
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/24/2015
Date Made Active in Reports: 08/18/2015
Number of Days to Update: 25

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/18/2016
Next Scheduled EDR Contact: 08/01/2016
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/23/2016
Next Scheduled EDR Contact: 09/05/2016
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 04/14/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 50

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/14/2016
Next Scheduled EDR Contact: 06/27/2016
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Day Care Centers, Group & Family Homes
Source: Bureau of REgulatory Services
Telephone: 517-373-8300

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Natural Resources
Telephone: 517-241-2254

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

APPENDIX C

NOISE ANALYSIS IMPACT AND BENEFITTING UNITS TABLE AND MAPS

FINAL REPORT

Dort Highway Corridor Extension Project Genesee County

Traffic Noise Impact Analysis

Michigan Department of Transportation

January 2017

CDM Smith

Table of Contents

List of Figures

List of Tables

Appendices

Abbreviations and Acronyms

EA	Environmental Assessment
FONSI	Finding of No Significant Impact
CFR	Code of Federal Regulations
dB	decibel
dB(A)	A-weighted sound level in decibels
DCD	Double Crossover Diamond
FHWA	Federal Highway Administration
Hz	Hertz
Leq	equivalent sound pressure level
mph	miles per hour
NAC	Noise Abatement Criteria
MDOT	Michigan Department of Transportation
SPL	sound pressure level
TNM 2.5	FHWA Traffic Noise Model Version 2.5

Executive Summary

The Genesee County Road Commission is proposing to extend Dort Highway south from I-75 to Baldwin Road in Grand Blanc Township, Genesee County. Currently Dort Highway ends at I-75 (Exit 109). Genesys Health Park, one of the largest employers in the county, is currently served by the Holly Road interchange (Exit 108), one interchange south of the Dort Highway terminus. The Holly Road interchange is operating at a level of service D and approaching capacity. The proposed extension would provide additional access to the Genesys Health Park campus, significantly relieve congestion, and improve safety. Three build alternatives – Option 1, Option 2, and Option 3, McWain Road were evaluated in this traffic noise impact analysis.

This traffic noise impact analysis identifies all traffic noise impacts, and in accordance with MDOT Noise Analysis and Abatement Handbook (2011), presents the recommendations for, or against, the construction of traffic noise abatement measures for the proposed Dort Highway extension.

This traffic noise impact analysis documents the evaluation of existing ambient noise levels at eight (8) noise monitoring locations and the assessment of existing (2015) and design year (2040) traffic noise levels and traffic noise impacts at 184 receptors in the vicinity of the proposed Dort Highway extension. Build Option 1 Preferred Alternative and Option 2 are expected to impact four (4) and three (3) receptors respectively. Option 3 McWain is expected to have six (6) impacted receptors. No abatement measures were recommended as none met the required feasibility and reasonableness criteria.

Loud construction noise activities such as usage of pile-drivers and impact hammers will cause temporary, sporadic, and acute construction noise impacts in isolated areas. If construction persists for a period longer than two years and where impacts to nearby receptors are determined to be likely, the project team should incorporate construction noise abatement measures into the project.

Section 1
Introduction

This section describes the proposed project.

1.1 Project Description

The Genesee County Road Commission is proposing to extend Dort Highway south from I-75 to Baldwin Road in Grand Blanc Township, Genesee County. Currently Dort Highway ends at I-75 (Exit 109). Genesys Health Park, one of the largest employers in the county, is currently served by the Holly Road interchange (Exit 108), one interchange south of the Dort Highway terminus. The Holly Road interchange is operating at a level of service D and approaching capacity. The proposed project is an extension of Dort Highway south from I-75/M-54 north (Exit 109) to Baldwin Road. The proposed extension would provide additional access to the Genesys Health Park campus, significantly relieve congestion, and improve safety.

The Dort Highway extension project has been in various stages of development for more than 40 years. This extension has been included in all succeeding regional transportation plans, including the most recent, Freight and Connectivity Study, 2009. The Dort Highway extension project is also supported locally by Grand Blanc Township, as expressed in the Township's Master Plan (2013 Supplemental Amendment), as a key component of a planned Technology Village encompassing 4,000 acres including the Genesys Health Park campus. The preliminary design includes two lanes in each direction with turn lanes at intersections and a shared use path and sidewalks.

Land uses within the study area is primarily residential connected to I-75 and other institutional/commercial land uses to the east. The proposed project study area map with alternatives are shown in **Figure 1-1**.

Three build alternatives for the Dort Highway extension were considered for a more detailed study. The alternatives included:

- **Option 1**

  This alternative is the Preferred Alternative and meets all the criteria stated in the Purpose and Need of the project. The corridor is proposed to be a two-lane road with a lane in each direction and a center two-way, left turn lane. It begins with a roundabout on the west side of I-75, which connects the existing north and south I-75 ramps at Dort Highway (Exit 109). The roundabout is located approximately 500 feet southwest of the existing I-75 bridge. There is also a roundabout on the east side of I-75, which connects the I-75 entrance and exit ramps to Dort Highway. From the roundabout on the west side of I-75, the new Dort Highway extension utilizes a reverse horizontal curve and turns south to cross Cook Road at a 90-degree angle. The roadway continues south beyond Cook Road and parallels the Consumers Energy right-of-way. South of Cook Road, it intersects with Pollock Road, then continues south and ties into Baldwin Road at a 90-degree angle.

- **Option 2**

  This alternative is a slight variation on Option 1, in that the extension of Dort Highway would begin on the west side of I-75 slightly east of the connection to the ramp proposed in Build Option 1. The extension would then proceed to the southeast and intersect with Cook Road east of the intersection proposed for Build Option 1. At this point, the road extension would curve south and connect at the same location as proposed for Option 1.

- **Option 3 McWain Road**

  This alternative includes extending Dort Highway south and west to intersect with the existing ROW for McWain Road south of Cook Road. Property would need to be acquired at the northern end of the extension to make the connection to the existing ramp. The road section would be similar to the Build Alternative 1. The McWain Road ROW varies in width south of the Cook Road/McWain Road Intersection. Additional ROW will be needed where existing ROW is insufficient. Also, grading easements will be required throughout this area of the alignment.

This traffic noise impact analysis identifies all traffic noise impacts, and in accordance with MDOT Noise Analysis and Abatement Handbook (2011), presents the recommendations for, or against, the construction of traffic noise abatement measures for the Dort Highway extension.

1.2 Statement of Compliance

This analysis will follow Federal Highway Administration (FHWA) Regulation 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," and the MDOT Noise Analysis and Abatement Handbook (2011).

According to FHWA and MDOT, there are three types of projects:

- Type I Project - Noise abatement accomplished in conjunction with a construction or reconstruction project on a section of federal-aid highway, as designated in 23 CFR Part 772.
- Type II Project - Noise abatement on an existing section of a federal-aid highway which does not include construction or reconstruction, as designated in 23 CFR Part 772. MDOT participates in the Type II program but currently it is suspended due to financial constraints.
- Type III Project - A Federal or Federal-aid highway project that does not meet the classifications of a Type I or Type II project, as designated in 23 CFR Part 772. Type III projects are exempt from doing a noise analysis.

The proposed project is designated as a Type I project because the project modifies an existing interchange and construction of a highway on new location.

1.3 Date of Public Knowledge

The Date of Public Knowledge or the date of approval of the final environmental document for this project will be the date of approval of the Finding of No Significant Impact (FONSI) for the project.

The criteria for determining when undeveloped land is "permitted" for development will be the approval date of a building permit for an individual lot. After the Date of Public Knowledge for the project, federal and state governments are no longer responsible for providing noise abatement measures for new development within the noise impact area of the proposed highway project. It is the responsibility of local governments and private landowners to ensure that noise compatible designs are used for development permitted after the Date of Public Knowledge.

The state and federal policy applies only to developed land and to undeveloped land with an active building permit before the project Date of Public Knowledge. Mitigation measures studied in this traffic noise impact analysis are evaluated for developed and undeveloped land permitted for development prior to the date of public knowledge.

Dort Highway Extension

Genesee County, MI

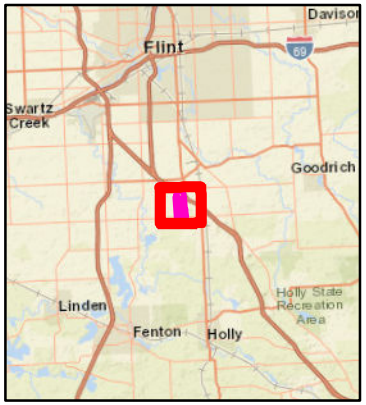
Project Vicinity Map

Figure 1-1

Legend

Name

- McWain Road Option
- Options 1 and 2
- Project Area Boundary



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Rowe Professional Services Company

Section 2
Basic Noise Concepts

This section describes basic noise terminology and concepts and applicable regulations.

2.1 Fundamentals of Noise

Noise can be defined as unwanted sound. Traffic noise (or any noise) can disrupt normal activities when the noise reaches certain levels and when the noise is distinctly louder than the typical ambient noise environment. **Figure 2-1** shows some examples of common noise sources and their sound levels.

Sound levels are usually measured and expressed in decibels (dB). The decibel scale is logarithmic and expresses the ratio of the sound pressure unit being measured to a standard reference level. Most sounds heard in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The intensities of each frequency add to generate sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound according to a weighting system, which reflects the fact that human hearing is less sensitive at low and extremely high frequencies than at the mid-range frequencies. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (dBA). "A" weighting most closely represents the response of the human ear to sound. In practice, the level of a noise source is measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from various sources, including relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of traffic noise, a statistical noise descriptor called the equivalent hourly sound level (Leq(h)) is commonly used. Leq(h) describes a noise sensitive receiver's cumulative exposure in a single value representing the average sound level in dB(A) over a one-hour period. Noise sensitive receivers are locations that may be subject to interference from noise. They include picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.

Additional noise measures included the minimum A-weighted noise level (Lmin) and maximum Aweighted noise level Lmax. The Lmin represents the minimum noise level that occurs during a time period, while Lmax represents the maximum level that occurs.

A key concept in evaluating potential noise impacts is the perceived effect of incremental increases in existing noise levels. The relationships between changes in sound levels, loudness, and acoustic energy are presented in **Table 2-1**. The table shows that an increase of 3 dB(A) is barely

perceptible, an increase of 5 dB(A) is readily perceptible, and a 10 dB(A) increase would be perceived by someone to be a doubling of the noise level (loudness).

Figure 2-1

Common Sound/Noise Levels

Common Outdoor Noise Levels	Noise Level (dB(A))	Common Indoor Noise Levels
	110	Rock Band
Jet Flyover at 1,000 feet	100	Inside Subway Train (NY)
Gas Lawn Mower at 3 feet		
Diesel Truck at 50 feet	90	Food Blender at 3 feet
Noisy Urban Daytime	80	Garbage Disposal at 3 feet
Gas Lawn Mower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Small Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
	30	
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (Background)
	20	
		Broadcast and Recording Studio
	10	
	0	Threshold of Hearing

Adapted from Guide on Evaluation and Attenuation of Traffic Noise, American Association of State Highway and Transportation Officials (AASHTO). 1974 (revised 1993).

Table 2-1 Relationships between Changes in Sound Levels and Loudness

Sound Level Change	Changes in Loudness
+30 dB(A)	Eight Times as Loud
+20 dB(A)	Four Times as Loud
+10 dB(A)	Twice as Loud
+5 dB(A)	Readily Perceptible
+3 dB(A)	Barely Perceptible
0 dB(A)	No Change
-3 dB(A)	Barely Perceptible
-5 dB(A)	Readily Perceptible
-10 dB(A)	Half as Loud
-20 dB(A)	1/4 as Loud
-30 dB(A)	1/8 as Loud

Source: FHWA 2011

Note: Relative to the loudness of an initial sound level. E.g. the loudness of a 63 dB(A) sound would be barely perceptible from the loudness of a 60 dB(A) sound. An 80 dB(A) sound would generally be perceived as four times as loud as a 60 dB(A) sound.

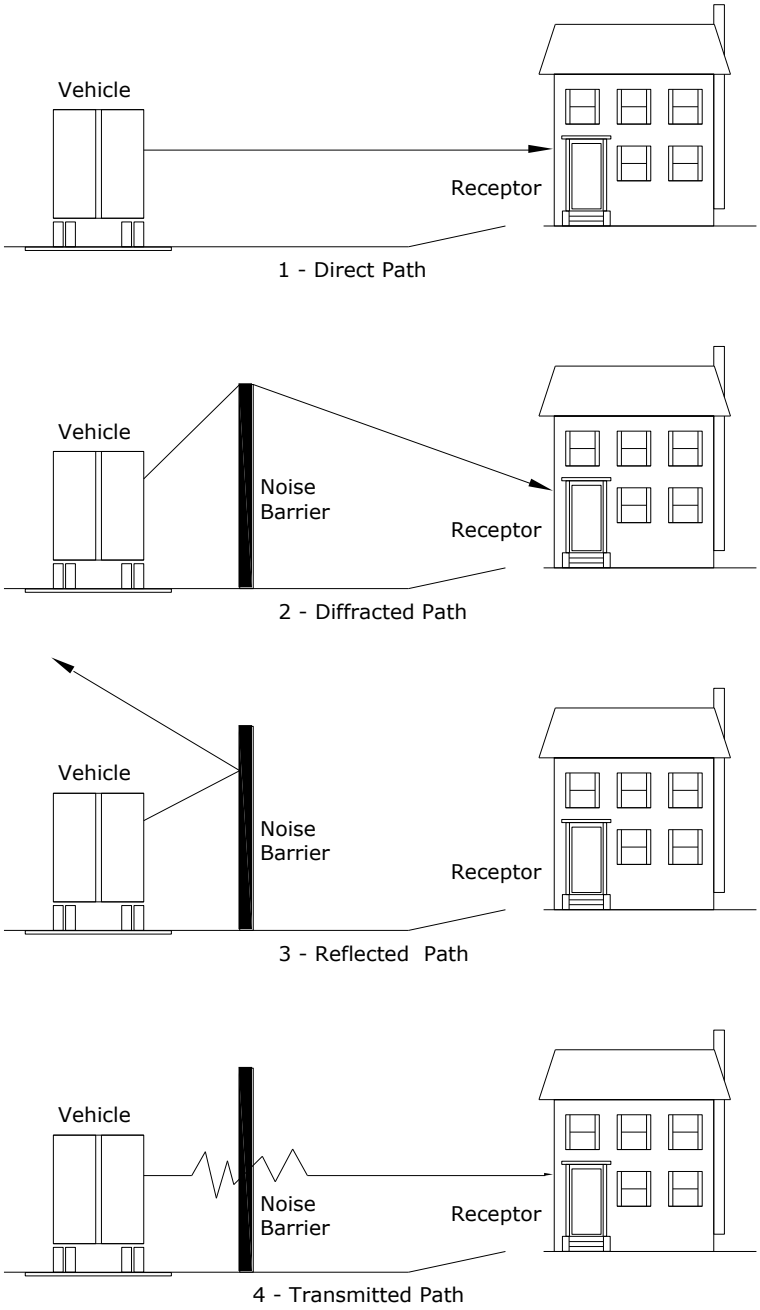
2.2 Traffic Noise and Propagation

Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Traffic noise can also be increased by defective mufflers or other faulty equipment on vehicles. Any condition (such as a steep incline) that causes heavy laboring of motor vehicle engines will also increase traffic noise levels.

As a person moves away from a highway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and manmade obstacles. Noise emanating from a roadway can follow four paths to reach nearby receptors (**Figure 2-2**):

1. Direct Path: The noise follows a straight path from the source to the receptor.
2. Diffracted Path: The noise follows a path from the source to the top of a barrier and then is bent down toward the receptor.
3. Reflected path: The noise is bounced off of a barrier and concerns only the receptor on the opposite side of the roadway from the barrier.
4. Transmitted Path: The noise is transmitted directly through the barrier.

Thus, a wall, building, earth berm, hill, or any type of solid structure or terrain feature, if large enough, can serve as a sound barrier and can provide some reduction at receptors in the "shadow zone" created by the barrier. Maximum reduction is achieved by breaking the line of sight between the noise source and the receptor.



Source: FHWA

Figure 2-2
Different Paths Followed by Noise

Vehicle traffic sounds are generally considered to be unwanted, or noise, to most people. The level of highway traffic noise depends on three things:

- the volume of the traffic;

- the speed of the traffic; and
- the number of trucks in the flow of traffic.

Highway traffic noise is never constant. The noise level is always changing with the number, speed, and type of the vehicles which produce the noise as well as the driving habits of the vehicle operator. Heavier traffic volumes, higher speeds, and greater number of trucks increase traffic noise as shown in **Figure 2-4**.

2000 vehicles per hour sound twice as loud as

200 vehicles per hour

How Speed Affects Traffic Noise

Traffic at 65 miles per hour sounds twice as loud as

traffic at 30 miles per hour

How Trucks Affect Traffic Noise

One truck at 55 miles per hour sounds as loud as

12 cars at 55 miles per hour

Source: FHWA 2010

Figure 2-4
Effect of Traffic Volume, Speed, and Vehicle Types on Noise Levels

2.3 Highway Noise Regulations

To determine if highway noise levels are compatible with various land uses, FHWA have developed noise abatement criteria (NAC) and procedures to be used in the planning and design of highways. These abatement criteria and procedures are in accordance with Title 23 CFR Part 772 and MDOT's noise policy. A summary of the current FHWA NAC for various land uses is presented in **Table 2-2**.

Table 2-2 Noise Abatement Criteria Hourly A-Weighted Sound Level in Decibels

Activity Category	Activity Leq(h) (dB(A))	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67	Exterior	Residential
C[1]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[1]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	NA	NA	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), and warehousing.
G	NA	NA	Undeveloped lands that are not permitted

Source: MDOT 2011

Note: [1] Includes undeveloped lands permitted for this activity category.

A receptor is defined as a discrete or representative location of a noise sensitive area such as a single residence or apartment, for any of the land uses listed in **Table 2-2**. Traffic noise impact occurs when predicted levels "approach" the NAC (at least 1 dB(A) of NAC) or when predicted traffic noise levels "substantially" exceed the existing noise level. Based on MDOT's noise policy, a 10 dB(A) increase of future predicted noise levels above existing noise levels is considered a "substantial increase" (MDOT 2011).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any action taken to reduce the impact of traffic noise on an activity area. For the areas where impacts are identified, methods of noise abatement are evaluated to determine the feasibility and reasonableness of their implementation. An abatement measure must meet both feasible and reasonable criteria. An abatement measure is considered to "benefit" a residence if the noise level at that residence is reduced by at least 5 dB(A). Feasibility is primarily concerned with the acoustical and engineering ability and limitations of a noise abatement measure. Feasibility

evaluation is based on many factors, including topography, availability of space, drainage, presence of other noise sources, safety, and maintenance requirements. Abatement is feasible when it provides a 5 dBA or greater noise reduction for at least 75% of impacted receptors or may cause constructability, safety or maintenance problems (MDOT 2011).

Reasonableness is a more subjective criterion than feasibility. MDOT reasonableness criteria include, but are not limited to, number of benefited residences in relation to the cost of the abatement, views of the benefiting receptors determined through NEPA public involvement process and voting, and design year noise levels. The objective of a noise abatement measure is to provide design year noise level reduction by a minimum of 10 dB(A) for at least one benefited receptor and 7 dB(A) for at least 50 percent of the benefited receptors. Residences (i.e. owner occupied, rental units, mobile homes, etc.) include all dwelling units, including each unit in a multi-family building. Noise abatement measures should cost $45,103 (calculated at $45.00 per square foot of wall) per benefited residence or less in 2016 dollars. A copy of the 2011 MDOT noise handbook is included in **Appendix B**.

Section 3
Ambient Noise Levels

This section describes the noise monitoring procedure and measured noise levels in the project area.

3.1 Noise Monitoring Procedure

The initial step in a noise analysis involves measuring ambient noise levels at various locations throughout the project area. Noise from natural and mechanical sources and human activity typically constitute the ambient noise in an area. The purpose of the ambient noise level measurement is to quantify the existing acoustic environment and provide a baseline for assessing the impact of future noise levels on the receptors in the vicinity of the proposed action resulting from increased traffic and the new roadway alignment. Field measurements will also assist in evaluating the level of noise reduction that may be provided by existing elements such as fences and scattered vegetation that cannot be precisely modeled by the computer. This information will be an important consideration in the determination of noise impacts and the evaluation of any associated noise abatement measures for the project.

Outdoor measurements were taken using a Type 1 SoundPro DL sound level meter on August 11, 2016. The noise meter was placed 5 feet above the ground level. Noise levels were measured for 15 minutes at each location and the equivalent steady-state sound level (Leq) was collected for each site logged in one minute intervals. One-minute data log is important to determine any aberrant noise events at each site. Noise monitoring locations are shown in **Figure 3-1** and are described in more detail with photos in **Appendix A**. No interior noise level measurements were performed.

Traffic counts were recorded concurrently at monitoring locations "Validate 1-5" to compare between measured and predicted levels to validate the TNM 2.5 model. The noise modeling validation procedure typically is as follows.

1. While recording the short–term (15 minute) traffic noise level field measurements along the project corridor, observe and record traffic volumes from roadways (classifying the appropriate vehicular types based on FHWA vehicle types) and determine the average vehicular speed.

2. Calculate the noise levels Using TNM 2.5 model built by inputting the traffic characteristics recorded during noise monitoring (expanded to one hour), site geometry, and any other pertinent existing features.

3. Compare the field-observed values to the predicted values. If the difference between the two values is less than ±3 dB(A), the model is within the accepted level of accuracy.

4. If the observed noise levels differ from the modeled noise levels by greater than ±3 dB(A), and after thorough examination of the observed and predicted data, it may be practical to establish an "adjustment factor" to be applied to modeling results after consultation with MDOT in certain cases.

3.2 Noise Monitoring Results

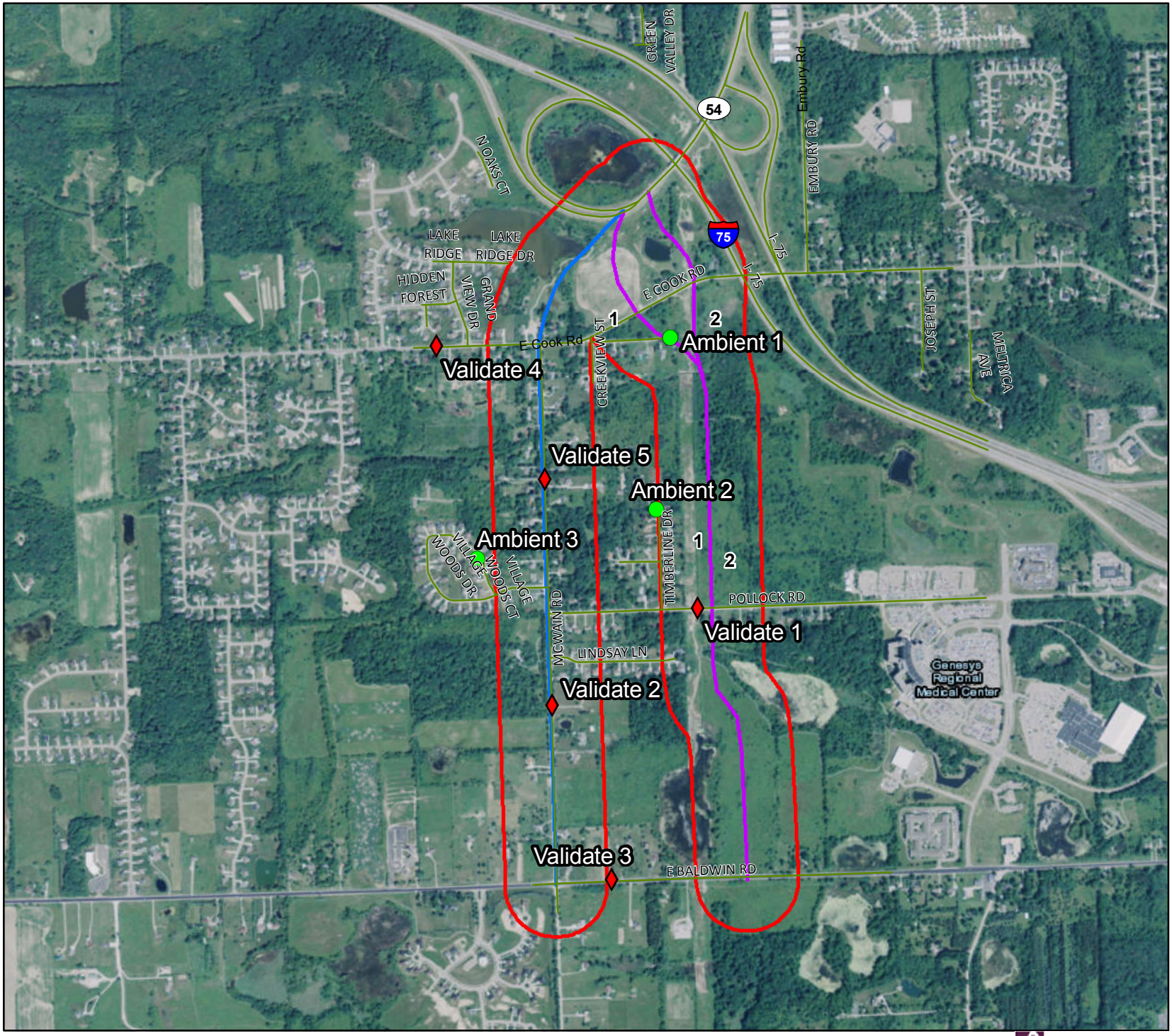
A summary of measured noise levels are provided in **Table 3-1**. Measured noise levels ranged from 47.7 dB(A) to 75.7 dB(A). Summary of output from the noise meter at each monitoring location is included in **Appendix A**. Meteorological data was collected at the Bishop International Airport (KFNT). No precipitation during the monitoring period was observed or reported (Weather Underground 2016). A summary of meteorological data from the monitoring periods are presented in **Table 3-2**.

Dort Highway Extension

Genesee County, MI

Field Monitoring Noise Levels

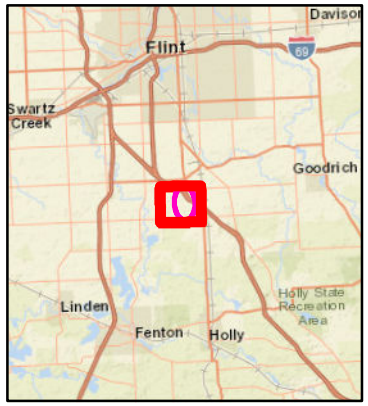
Figure 3-1



Legend

Monitoring Site

- Validation Site
- Ambient Site
- McWain Road Option
- Options 1 and 2
- Project Area Boundary



0 500 1,000 2,000 3,000 4,000 5,000 Feet

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Table 3-1 Measured Noise Levels

Site #	Date	Start	End	Leq (dBA)	Location	Auto	MT	HT
Validate 1	8/11/2016	8:07	8:22	61.6	Pollock Rd	52	0	0
Validate 2	8/11/2016	8:30	8:45	60.8	McWain Rd (South)	52	0	0
Validate 3	8/11/2016	8:53	9:08	75.7	E Baldwin Rd	628	20	4
Validate 4	8/11/2016	7:19	7:34	69.8	E Cook Rd	204	0	0
Validate 5	8/11/2016	7:44	7:59	61.8	McWain Rd (North)	40	4	0
Ambient 1	8/11/2016	10:08	10:23	48.8	E Cook Rd (Spur)			
Ambient 2	8/11/2016	9:20	9:35	47.7	Timberline Dr			
Ambient 3	8/11/2016	9:44	9:59	48.3	Village Woods Ct			

Note: Traffic data was not collected at monitoring locations "Ambient 1" through "Ambient 3".

Table 3-2 Meteorological Data during Monitoring

Time EST	Temperature F	Dew Point F	Humidity	Wind Direction	Wind Speed MPH	Precipitation In	Conditions	Date UTC
6:53:00 AM	77	71.1	82	SSW	3.5	N/A	Overcast	8/11/2016
7:53:00 AM	78.1	72	81	South	5.8	N/A	Overcast	8/11/2016
8:53:00 AM	82	73	74	SSW	8.1	N/A	Mostly Cloudy	8/11/2016
9:53:00 AM	86	73	65	SSW	9.2	N/A	Partly Cloudy	8/11/2016
10:53:00 AM	88	72	59	SW	11.5	N/A	Scattered Clouds	8/11/2016
11:53:00 AM	89.1	72	57	SSW	10.4	N/A	Scattered Clouds	8/11/2016

Source: Bishop International Airport- (KSDF), Michigan (Weather Underground 2016)

Note: This is the closest station to the project area with readily available data.

Section 4
Noise Analysis

This section describes the noise analysis procedure and results.

4.1 Noise Analysis Procedure

Land use in the project area is primarily single family residential with undeveloped wooded lands zoned residential as shown in zoning map on Figure 4-1. Sites within the Dort Highway corridor with similar land use and traffic, i.e. land use and traffic characteristics were identified into a single residential Common Noise Environments (CNE) for analysis for all options. For the undeveloped lands, there were no currently approved building permits at the time of the noise study.

FHWA's Traffic Noise Model Version 2.5 (TNM 2.5) traffic noise prediction and analysis software is capable of predicting highway traffic noise. Released in April 2004, TNM 2.5 is the latest version currently available and is the required noise analysis software on all federal-aid highway projects. TNM2.5 predicts noise levels at receptor locations based on vehicle volume, speed, fleet mix, distance to receiver, and area terrain.

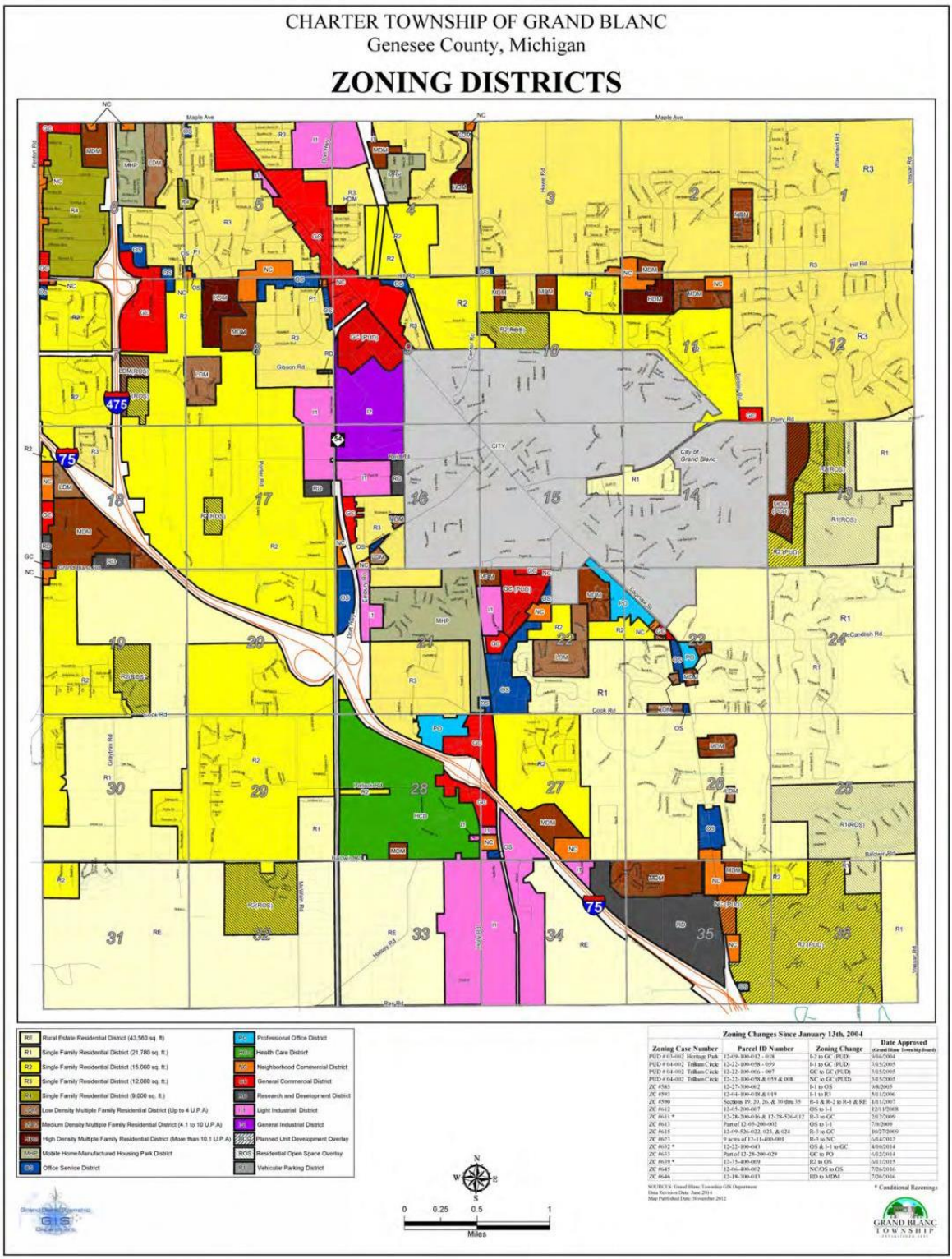
The traffic noise scenarios evaluated in this analysis include the following:

- Existing (2015) loudest-hour noise levels;
- Design year (2040) No Build loudest-hour noise levels; and
- Design year (2040) Build loudest-hour noise levels.

Traffic forecasts and truck percentages for the project was provided by MDOT for all scenarios. Provided traffic volumes were separated into auto, medium trucks, and heavy trucks based on the given truck percentages. Receptors in the model were placed at every residence and land use category within the project area. 184 receptors were modeled within the study area.

The "loudest noise hours" usually occurs during peak traffic hours when truck volumes and vehicle speeds are the greatest and when traffic is at or near free-flow conditions. Based on field observations and traffic data provided for the project, the daily flow of traffic into and out of the study area, the "loudest noise hours" for the receptors occurs between 7 and 9 AM and between 4 and 6 PM. Since the proposed zoning for the study area is residential and the new location Options were expected to be similar to the existing McWain Road, the loudest hour was assumed to be the same for all options. The existing (2015) and future (2040) traffic volumes (AM and PM peak) that were used. The existing and future traffic volumes were developed by MDOT as a part of the Environmental Assessment (EA). Vehicle class distributions used in the noise impact analysis were based on information that MDOT provided.

Figure 4-1 Zoning Map



4.2 Comparison with Field Measured Noise Levels

Traffic volumes collected during noise monitoring were modeled. Modeled noise levels for the existing conditions were compared against monitored noise levels presented in Section 3.2 to evaluate the accuracy of the model setup. **Table 4-1** compares monitored noise levels and the respective modeled noise levels.

Table 4-1 Measured and Modeled Noise Levels

Monitoring Location	Measured Leq (dB(A))	Modeled Leq (dB(A))	Difference (dB(A))
Validate 1	61.6	60.7	-0.9
Validate 2	60.8	58.7	-2.1
Validate 3	75.7	72.3	-3.4
Validate 4	69.8	67.5	-2.3
Validate 5	61.8	59.3	-2.5

Modeled and monitored noise levels at monitoring locations are within +/- 3 dB (A), as required by MDOT to validate models (MDOT 2011). Validate 3 station was higher than 3dBA in the field measurement due to background noise and close proximity of the noise meter to the road. Lpk events up to 106 dBA was recorded at certain intervals from exhaust/tire noise from vehicles. Since Validate 3 didn't fall within the 3dBA, the model was not used for further analysis.

4.3 Predicted Noise Levels

Noise levels were calculated for existing (2015) and design year (2040) loudest-hour traffic volumes at 184 receptor sites. The receptor sites are numbered in numeric order beginning with "R1." Predicted noise levels for the No Build and Build scenarios were calculated and compared to the existing conditions noise levels at all modeled receptors. The magnitude of the predicted noise levels and their increase over existing levels determines if a noise impact occurs (i.e. approaching FHWA NAC or substantial increase in noise level).

It was estimated that the modeled receptors currently experience noise levels between 46 and 68 dB(A), with 3 impacted receptors. In 2040, the noise levels are anticipated to increase to between 49 and 70 dB(A) with or without the proposed project. Without the project, 3 receptors would be impacted. With the project, Option 1 would result in 4 impacts and Option 2 would have 3 impacts. Option 3 is expected to have 4 receptors that meet or exceed the NAC criteria and 2 receptors for the substantial increase criteria. Build Option 3 is expected to have 6 impacts. Due to the close proximity of receptors on McWain Road, Build Option 3 results in more impacts and residents along McWain Road are expected to experience an increase in noise levels due to increase traffic. Residents can expect an approximate increase up to 10dBA in some areas within the study area. These impacted receptors are located at the residential properties closest to the new Dort Highway extension. Noise levels are anticipated to be similar between Build Option 1 and Option 2 Alternatives. Receptors along Lindsay Lane and Timberline Drive can expect noise levels to increase up to 9 dBA but not impacted from NAC or substantial increase criteria. The Build Alternative 3 McWain Road option results in higher noise impacts due to the increase in traffic on

McWain Road compared to the existing. The noise impact summary for the existing (2015) and design year (2040) are shown in **Table 4-2** and **Figures 4-1** through **4-5**.

Table 4-2 Traffic Noise Impact Summary (184 modeled receptors)

Scenario	Approximate # of Impacted Receptors Approaching or Exceeding FHWA NAC							Substantial Noise Level Increase [1]	Total Impacts per 23 CFR 772 [2]
	A	B	C	D	E	F	G		
Build – Option 1	0	4	0	0	0	0	-	0	4
Build – Option 2	0	3	0	0	0	0	-	0	3
Build – Option 3 McWain	0	4	0	0	0	0	-	2	6

Note:

[1] Predicted MDOT "substantial increase" traffic noise level impact.

[2] The total number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion.

A summary of the 2015 existing, 2040 No-Build, and 2040 Build Alternatives predicted noise levels by receptor number and description with maps for each option are also provided in **Appendix C.**

4.4 Abatement Analysis

4.4.1 Federal and State Abatement Guidance

MDOT's Noise Policy has established the criteria for determining where noise abatement must be provided. The policy is summarized as follows:

Where adverse noise impacts are expected to occur, noise abatement will be considered and will be implemented if found feasible and reasonable for existing developments, and future developments that were approved before the date of public knowledge of the project. Approved means that a building permit has been received. After the date of public knowledge, MDOT is not responsible for providing noise abatement for new developments. The date of public knowledge is the date that the project's environmental analysis and documentation is approved (i.e. the date of approval of the Finding of No Significant Impact for an EA for this project). The provision of noise abatement for new developments becomes the responsibility of local governments and private developers.

Feasible - This refers to engineering considerations such as: constructability of a noise barrier on the existing topography; achievement of substantial noise reductions; the presence of other noise sources in the area; and the ability to maintain access, drainage, safety, utilities in the area. While every reasonable effort should be made to obtain a substantial noise reduction, a noise abatement measure is not feasible if it cannot achieve at least a 5 dB(A) noise reduction for 75% of impacted receivers during design year traffic noise.

Reasonable - Noise mitigation will be considered reasonable if:

- During the environmental clearance phase, the preliminary cost per benefiting unit is less than 3% above allowable per benefitting unit level ($45,103 in 2016 dollars, based on a $45/square foot unit cost);
- The public viewpoint reasonableness factor for the environmental clearance phase receives generally positive comments from the benefiting units; and
- The noise barrier provides a design year traffic noise reduction of 10 dB(A) for at least one benefitted unit and at least a 7 dB(A) for 50% or more of the benefitted units.

Highway traffic noise abatement alternatives, which are listed in 23 CFR 772.15(c) include:

- Construction of noise barriers including acquisition of property rights, either within or outside the highway right-of-way;
- Traffic management measures;

- Alteration of horizontal and vertical alignments;
- Acquisition of real property or interests therein, to serve as a buffer zone to preempt development;
- Noise insulation of Activity Category D land use facilities listed in the Noise Abatement Criteria Table.

Reduction in the speed limit or other traffic management measures are not considered appropriate for noise abatement due to their effect on the capacity and level–of-service of the proposed project. The existing terrain and land uses restrict substantial horizontal and vertical alignment shifts that could potentially produce noticeable changes in the noise environment and therefore are not considered. Due to significant right of way required for noise berm construction, the construction of noise berms is neither feasible nor reasonable. Category D land uses are not present in the study area. Therefore, the construction of noise barriers within the existing right of way was evaluated for feasibility and reasonableness for the build alternatives as a potential mitigation measure.

4.4.2 Noise Barrier Analysis

Mitigation using noise barriers involves construction of solid mass barriers to effectively diffract, absorb, and reflect highway traffic noise. A noise barrier must be high enough and long enough to shield the receptor from significant sections of the highway in order to provide sufficient noise reduction. Access openings in the barrier severely reduce the noise reduction provided by the barrier. It is economically unreasonable to construct a barrier for a small noise reduction. Safety at access openings (driveways, crossing streets, etc.) due to restricted sight distance is also a concern. Furthermore, to provide a sufficient reduction, a barrier's length would normally be eight times the distance from the barrier to the receptor. For example, a receptor located 50 feet from the barrier would normally require a barrier 400 feet long. An access opening of 40 feet (10 percent of the area) would limit its noise reduction to approximately 4 dB(A). For the impacted receptors on McWain Road, construction of noise barriers are not reasonable due to the proximity of the receptors to Pollock Road and Lindsay Lane on McWain Road. For Options 1 and 2, impacted receptors are isolated receptors and the noise level increase is primarily due to increase in traffic in the Build year on existing facilities. For Option 1, R92 is directly impacted due to the close proximity of the proposed facility to the receptor. Quantitative noise barrier analysis is not conducted for the isolated impacted receptors for Option 1&2 since they are not feasible.

Table 4-3 Impacted Receptors

Receptor Address	Dwelling Units or Equivalent Receptors	NAC	2040 Build Noise Level (dBA)	Change in Noise Level from Existing (dBA)	Major Noise Source	Barrier Feasible? (Reason)	Barrier Reason-able?
Option 1							
R58 – 2405 E Baldwin Rd	1	B	66	2	E Baldwin Road	No (isolated receptors)	N/A
R92 – E Cook Rd	1	B	66	9	Build Option 1		
R105 – E Cook Rd	1	B	69	1	I-75		
R111 – 3107 E Baldwin Rd	1	B	68	3	E Baldwin Road		
Option 2							
R58 – 2405 E Baldwin Rd	1	B	66	2	E Baldwin Road	No (isolated receptors)	N/A
R105 – E Cook Rd	1	B	70	2	I-75		
R111 – 3107 E Baldwin Rd	1	B	67	2	E Baldwin Road		
Option 3 McWain							
R43- 2404 Pollock Rd	1	B	67	10	Build Option 3	No (driveways/side streets)	N/A
R45- 2401 Lindsay Ln	1	B	65	10	Build Option 3		
R46 – 9317 McWain Rd	1	B	65	10	Build Option 3		
R58 – 2405 E Baldwin Rd	1	B	67	3	E Baldwin Road and Build Option 3		
R105 – E Cook Rd	1	B	69	1	I-75		
R111 – 3107 E Baldwin Rd	1	B	67	2	E Baldwin Road		

4.5 Coordination with Local Officials

Local communities and private developers are strongly encouraged to practice noise compatible land use planning to avoid future noise impacts. Local governments should use their power to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway or that the developments are planned, designed and constructed in such a way that noise impacts are minimized.

Federal participation in noise abatement measures will not be considered for lands that are not permitted by the date of public knowledge of the project and MDOT will not analyze or provide noise abatement for these lands. After the date of public knowledge, provision of noise abatement becomes the responsibility of local communities or private developers.

Local planning officials should use the information from this traffic noise impact analysis for preliminary identification of noise sensitive receptors and to determine suitable future development and zoning along undeveloped lands for Options 1 and option 2.

The extent of the 71 and 66 dBA noise level contours from the Build Options varies depending on the predicted traffic volumes for each alternative. This information should assist local authorities in exercising land use control over the remaining undeveloped lands adjacent to the roadway within the local jurisdiction. With the proper information on noise, the local authorities can prevent development of incompatible activities and land uses with the predicted noise level of an adjacent highway. To aid in this planning the future (2040), a 66 dBA noise contour (the noise level corresponding with MDOTs definition of "approaching" the NAC for Activity Categories B&C, and E) has been evaluated as a part of this study. The 66 dBA noise contour is offset approximately 101 feet and 63 feet for the 71 dBA from the center line of the alignment. The construction of noise sensitive properties within these limits should be avoided to prevent future impacts on the new location alignments. The contour lines are depicted in C1-C14 of Appendix C.

Section 5
Construction Noise

The major construction activities for this project are expected to be earth removal, hauling, grading, and paving. Temporary and localized construction noise impacts will likely occur as a result of these activities. Temporary speech interference for passersby and individuals living or working near the project can be expected. Noise levels in the project area will be increased during construction. The sound levels resulting from construction activities at nearby noise-sensitive receptors will be a function of the types of equipment utilized, the duration of the activities, and the distances between construction activities and nearby land uses. Default sound levels from construction equipment used in roadway construction are shown in **Table 5-1**.

If meeting the project schedule requires that earth removal, grading, hauling, and/or paving must occur during evening, nighttime, and/or weekend hours in the vicinity of residences, the Contractor shall notify Genesee County Road Commission as soon as possible. In such instances, all reasonable attempts shall be made to notify and to make appropriate arrangements for the mitigation of the predicted construction noise impacts upon the affected property owners and/or residents. Construction projects lasting longer than 2 years that are known to cause impacts must also incorporate mitigation measures.

Low-cost and easily implemented construction noise control measures should be incorporated into the project plans and specifications to the extent possible. These measures include, but are not limited to, work-hour limits, equipment exhaust muffler requirements, haul-road locations, elimination of "tail gate banging," ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

Table 5-1 FHWA RCNM Default Noise Emission Reference Levels and Usage Factors

Equipment Description	Impact Device?	Acoustical Use Factor	Spec 721.560 Lmax @ 50ft (dB(A), slow)	Actual Measured Lmax @ 50 ft (dB(A), slow)
Auger Drill Rig	No	20%	85	84
Backhoe	No	40%	80	78
Boring Jack Power Unit	No	50%	80	83
Chain Saw	No	20%	85	84
Clam Shovel (dropping)	Yes	20%	93	87
Compactor (ground)	No	20%	80	83
Compressor (air)	No	40%	80	78
Concrete Mixer Truck	No	40%	85	79
Concrete Pump Truck	No	20%	82	81
Concrete Saw	No	20%	90	90
Crane	No	16%	85	81
Dozer	No	40%	85	82
Drill Rig Truck	No	20%	84	79
Drum Mixer	No	50%	80	80
Dump Truck	No	40%	84	76
Excavator	No	40%	85	81
Flat Bed Truck	No	40%	84	74
Front End Loader	No	40%	80	79
Generator	No	50%	82	81
Generator (<25KVA, VMS signs)	No	50%	70	73
Gradall	No	40%	85	83
Grader	No	40%	85	N/A
Grapple (on backhoe)	No	40%	85	87
Horizontal Boring Hydr. Jack	No	25%	80	82
Hydra Break Ram	Yes	10%	90	N/A
Impact Pile Driver	Yes	20%	95	101
Jackhammer	Yes	20%	85	89
Man Lift	No	20%	85	75
Mounted Impact Hammer (hoe ram)	Yes	20%	90	90
Pavement Scarifier	No	20%	85	90
Paver	No	50%	85	77
Pickup Truck	No	40%	55	75
Pneumatic Tools	No	50%	85	85
Pumps	No	50%	77	81
Rock Drill	No	20%	85	81
Roller	No	20%	85	80
Scraper	No	40%	85	84
Shears (on backhoe)	No	40%	85	96
Tractor	No	40%	84	N/A
Vibratory Concrete Mixer	No	20%	80	80
Vibratory Pile Driver	No	20%	95	101
Warning Horn	No	5%	85	83
Welder/Torch	No	40%	73	74

Source: USDOT 2006

Section 6
Conclusions

This report documents the evaluation of existing ambient noise levels at six noise monitoring locations and the assessment of predicted loudest-hour equivalent existing, No Build, and Build condition traffic noise levels and traffic noise impacts at 184 receptors in the vicinity of the project. In 2040, the noise levels are anticipated to increase to with or without the proposed project. Based on the analysis, the Build Option 1 would result in 4 impacts and Build Option 2 would have 3 impacts. Build Option 3 is expected to have 6 impacts. Due to the close proximity of receptors on McWain Road, Build Option 3 results in more impacts and residents along McWain Road are expected to experience an increase in noise levels due to increase traffic. Residents can expect an approximate increase up to 10dBA in some areas within the study area. Driveways are located along McWain Road, therefore and effective noise barrier is not a feasible option for mitigation. No abatement measures would be reasonable for these impacted receptors. Any subsequent project design changes may require a reevaluation of the noise impacts and abatement measures.

Based on feedback received at the public meeting held in June 2016, residents shared their concerned on potential noise impacts from the project. Residents along McWain Road were primarily concerned about Option 3-McWain Road due to the close proximity of homes to the project.

Based on the traffic noise analysis, the Option 1 preferred alternative is expected to impact four noise receptors in the study area. Since the preferred option follows a new location alignment, direct impacts to receptors are minimal. To aid in this planning the future (2040), a 66 dBA noise contour (the noise level corresponding with MDOTs definition of “approaching” the NAC for Activity Categories B&C, and E) was developed to help local officials plan future development. The 66 dBA noise contour is offset approximately 101 feet from the center line of the alignment and should be taken into consideration for future residential development.

Construction noise impacts, some of them potentially extreme, will occur due to the close proximity of numerous noise-sensitive receptors to project construction activities. It is the recommendation of this report that all reasonable efforts should be made to minimize exposure of noise-sensitive areas to construction noise impacts. If construction persists for a period longer than two years and where impacts to nearby receptors are determined to be likely, the project team shall have the flexibility to incorporate construction noise abatement measures into the project.

Section 7
References

1. 23 CFR 772. *Procedures for Abatement of Highway Traffic Noise and Construction Noise.*

2. Arizona Department of Transportation. 2005. *Atmospheric Effects Associated with Highway Noise Propagation*. October.

3. Federal Highway Administration (FHWA). 1980. *Noise Fundamentals Training Document: Highway Noise Fundamentals.* September.

4. Federal Highway Administration (FHWA). 2010. *Highway Traffic Noise Website.* Available at: http://www.fhwa.dot.gov/environment/noise/. Accessed on: June 24, 2016.

5. Federal Highway Administration (FHWA). 2011. *Highway Traffic Noise Analysis and Abatement Guidance.* December. Available at: http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf. Accessed on: June 24, 2016.

6. Michigan Department of Transportation (MDOT). 2011. Michigan Department of Transportation Highway Noise Analysis and Abatement Handbook. July 13.

7. United States Environmental Protection Agency (USEPA). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.*

8. Weather Underground. August 11, 2016 Weather Data from Bishop International Airport . Available at: https://www.wunderground.com/history/airport/KFNT/2016/8/11/DailyHistory.html?req_city=&req_state=&req_statename=&reqdb.zip=&reqdb.magic=&reqdb.wmo=

Appendix A

Noise Monitoring Data

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date 8/11/16 Monitor Site # V1(3)

travel lanes 2 Direction of Lanes EB/WB

Speed limit 55 Surface Conditions HMA / Gravel shoulder

Grade Flat Wind Speed 4 Humidity 80%

Surrounding Land uses Residential / Rural

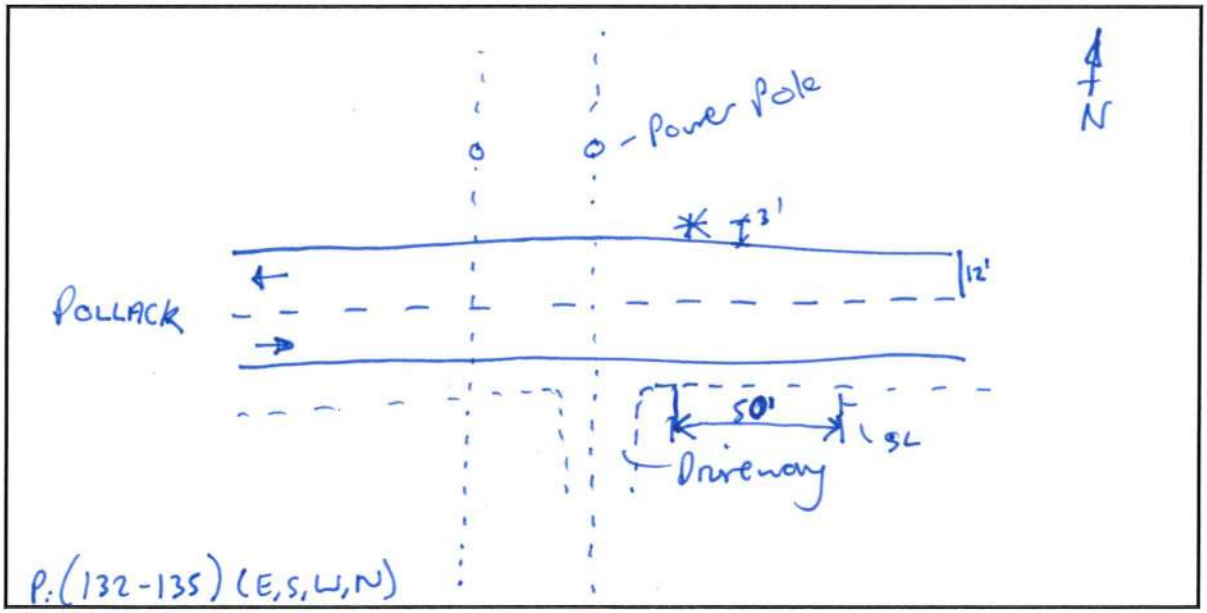
Time monitoring began 8:08 Time monitoring ended 8:23

Traffic # (15 min)	EB Lane			WB Lane		
Heavy Truck	0	# 0	VPH	0	# 0	VPH
Medium Truck	0	# 0	VPH	0	# 0	VPH
Cars	10	# 40	VPH	3	# 12	VPH
Total	10	# 40	VPH	3	# 12	VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 3 ft

Height above roadway 4 ft Height above Ground 4.5 ft



Site Sketch if needed

Background Noise Crickets / Birds

Major Noise Source Traffic

Unusual Events N/A

Comments


NORTH


SOUTH


EAST


WEST

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date 8/11/16 Monitor Site # V2 (4)

travel lanes 2 Direction of Lanes NB/SB

Speed limit 45 Surface Conditions Gravel/HMA

Grade Flat Wind Speed 4 Humidity 72

Surrounding Land uses Residential

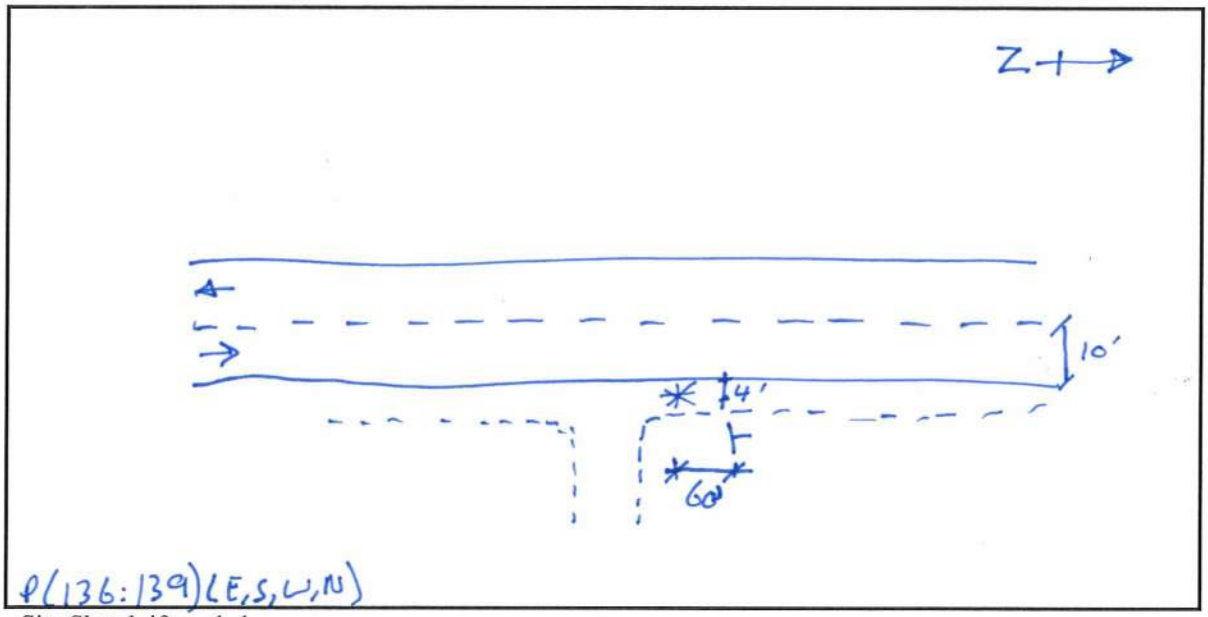
Time monitoring began 8:30 Time monitoring ended 8:45

Traffic # (15 min)	NB Lane			SB Lane		
Heavy Truck	0	# 0	VPH	0	# 0	VPH
Medium Truck	0	# 0	VPH	0	# 0	VPH
Cars	7	# 28	VPH	6	# 24	VPH
Total	7	# 28	VPH	6	# 24	VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 4 ft

Height above roadway 3.5 ft Height above Ground 4.5 ft



Site Sketch if needed

Background Noise Crickets/Birds

Major Noise Source Traffic

Unusual Events N/A

Comments


NORTH


SOUTH


EAST


WEST

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date 8/11/16 Monitor Site # V3 (S)

travel lanes 2 Direction of Lanes EB/WB

Speed limit 55 Surface Conditions HMA

Grade -2% Wind Speed 4 Humidity 72%

Surrounding Land uses Residential

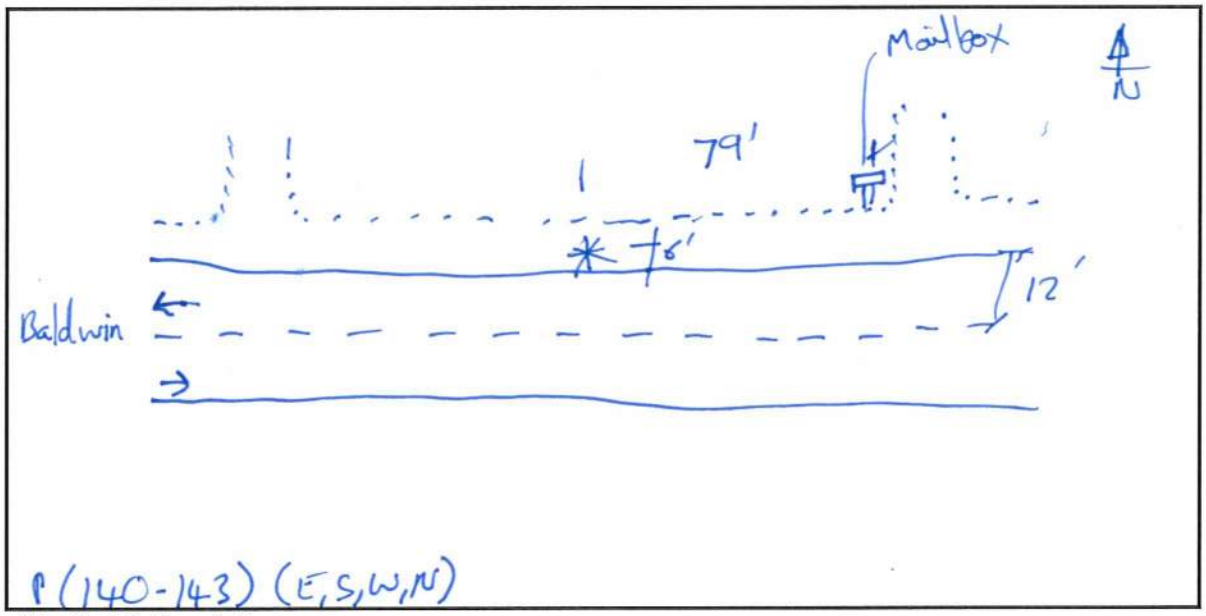
Time monitoring began 8:53 Time monitoring ended 9:08

Traffic # (15 min)	EB Lane		WB Lane	
Heavy Truck	1	# ~~1~~ 4 VPH	0	# 0 VPH
Medium Truck	4	# 16 VPH	1	# 4 VPH
Cars	94	# 376 VPH	~~63~~	# 252 VPH
Total	99	# 396 VPH	64	# 256 VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 6 ft

Height above roadway 4 ft Height above Ground 4.5 ft



P (140-143) (E,S,W,N)

Site Sketch if needed

Background Noise Crickets

Major Noise Source Traffic

Unusual Events N/A

Comments brief sprinkle


NORTH


SOUTH


EAST


WEST

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date 8/11/16 Monitor Site # V4 (1)

travel lanes 2 Direction of Lanes EB/WB

Speed limit 55 Surface Conditions Degraded HMA / Gravel Shldr

Grade FLAT Wind Speed SSW 4 Humidity 86%

Surrounding Land uses Residential

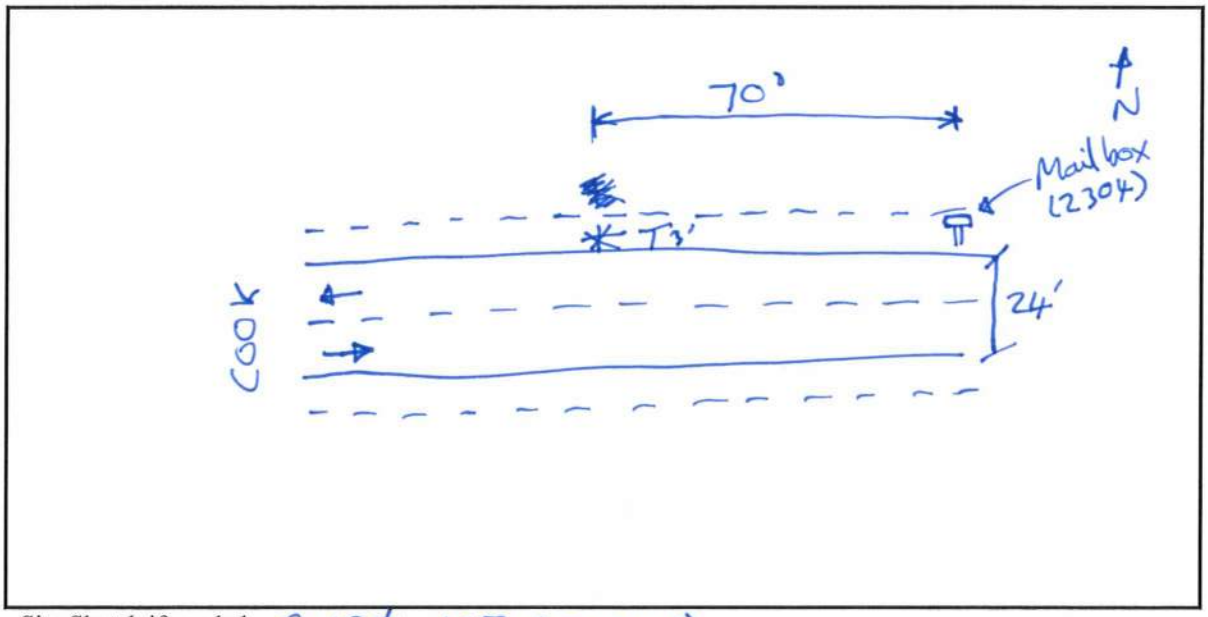
Time monitoring began _____ Time monitoring ended _____

Traffic # (15 min)	EB Lane			WB Lane		
Heavy Truck	0	# 0	VPH	0	# 0	VPH
Medium Truck	0	# 0	VPH	0	# 0	VPH
Cars	33	# 132	VPH	18	# 72	VPH
Total	33	# 132	VPH	18	# 72	VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 3 ft

Height above roadway 4 ft Height above Ground 4.5 ft



Site Sketch if needed P: 124 - 127 (E,S,W,N)

Background Noise Crickets

Major Noise Source ~~N/A~~ Traffic

Unusual Events N/A

Comments _____


NORTH


SOUTH


EAST


WEST

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date 8/11/16 Monitor Site # VS (2)

travel lanes 2 Direction of Lanes NB/SB

Speed limit 45 Surface Conditions Gravel/HMA

Grade 2% Wind Speed 4 Humidity 82%

Surrounding Land uses Residential

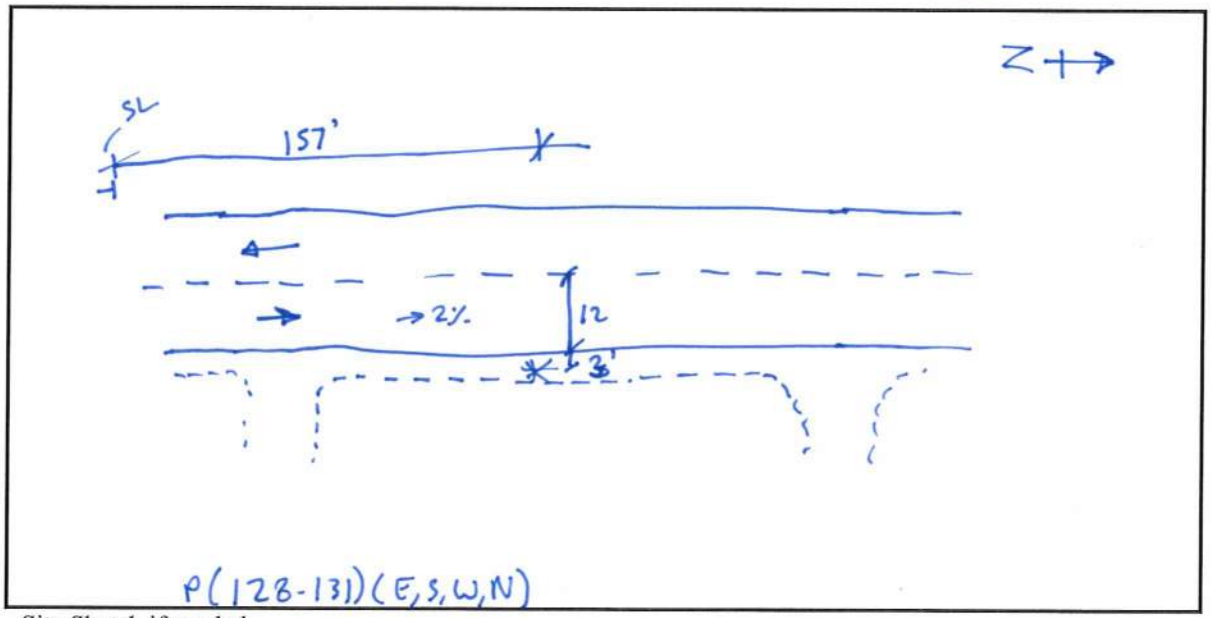
Time monitoring began 7:45 Time monitoring ended 8:00

Traffic # (15 min)	NB Lane			SB Lane		
Heavy Truck	0	# 0	VPH	0	# 0	VPH
Medium Truck	1	# 4	VPH	0	# 0	VPH
Cars	7	# 28	VPH	3	# 12	VPH
Total	8	# 32	VPH	3	# 12	VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 3 ft

Height above roadway 4 ft Height above Ground 4.5 ft



Site Sketch if needed

Background Noise Crickets

Major Noise Source ~~N/A~~ Traffic

Unusual Events N/A

Comments


NORTH


SOUTH


EAST


WEST


ROAD SURFACE

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date 8/11/10 Monitor Site # A1 (8)

travel lanes 2 Direction of Lanes EB/WB

Speed limit 25 Surface Conditions HMA

Grade Flat Wind Speed 7 Humidity 73%

Surrounding Land uses Residential/Rural

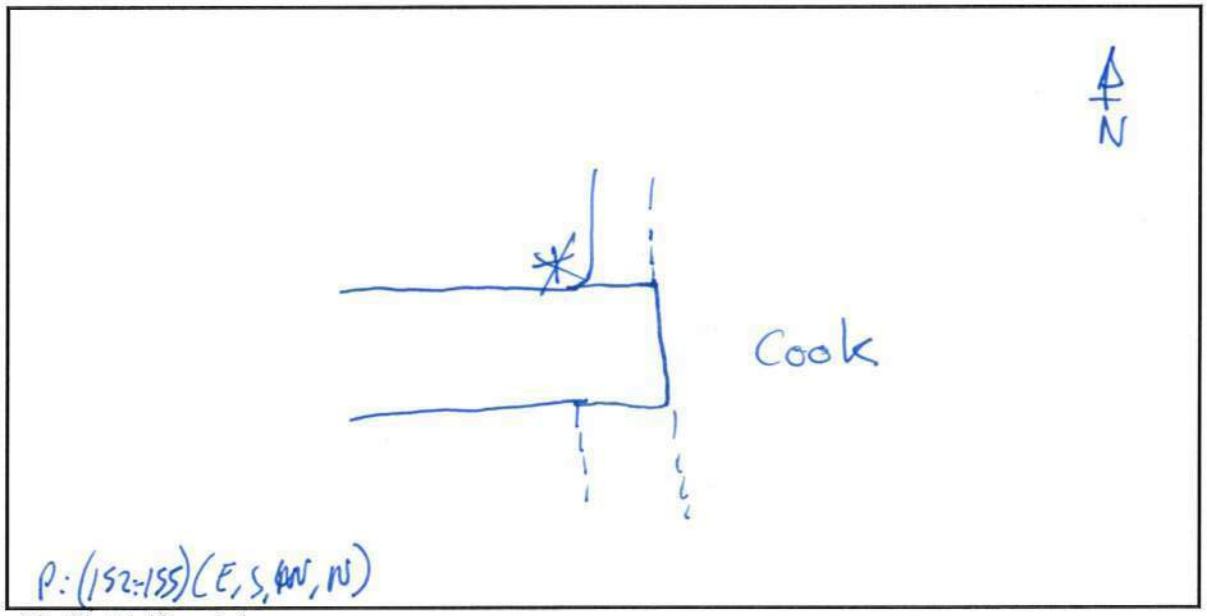
Time monitoring began 10:00 Time monitoring ended 10:25

Traffic # (15 min)	_____ Lane	_____ Lane
Heavy Truck	_____ # _____ VPH	_____ # _____ VPH
Medium Truck	_____ # _____ VPH	_____ # _____ VPH
Cars	_____ # _____ VPH	_____ # _____ VPH
Total	_____ # _____ VPH	_____ # _____ VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 0' ft

Height above roadway 4.5 ft Height above Ground 4.5 ft



Site Sketch if needed

Background Noise Crickets / birds / freeway

Major Noise Source nearby freeway

Unusual Events N/A

Comments _____


NORTH


SOUTH


EAST


WEST

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date _____ Monitor Site # A2(6)

travel lanes 2 - dead end Direction of Lanes NB - SB

Speed limit 25 Surface Conditions HMA

Grade flat Wind Speed _____ Humidity _____

Surrounding Land uses Residential

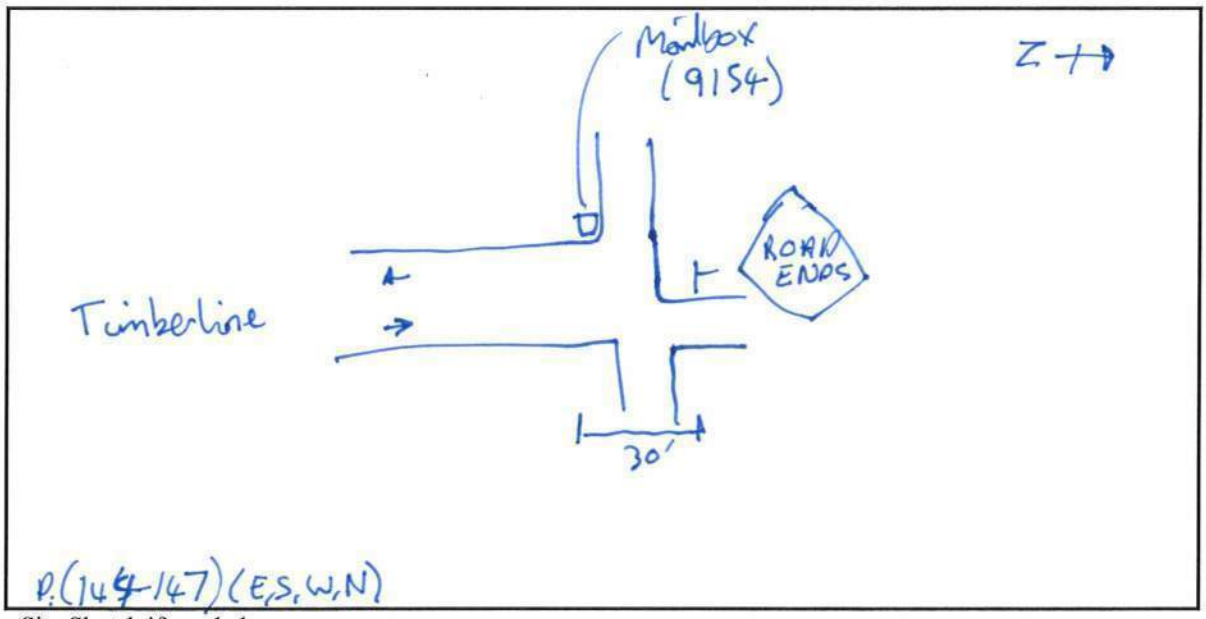
Time monitoring began 9:20 Time monitoring ended 9:35.

Traffic # (15 min)	_____ Lane			_____ Lane		
Heavy Truck	_____	# _____	VPH	_____	# _____	VPH
Medium Truck	_____	# _____	VPH	_____	# _____	VPH
Cars	_____	# _____	VPH	_____	# _____	VPH
Total	_____	# _____	VPH	_____	# _____	VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 0 ft

Height above roadway 4.5 ft Height above Ground 4.5 ft



P.(144-147)(E,S,W,N)

Site Sketch if needed

Background Noise N/A

Major Noise Source N/A

Unusual Events tripped over tripod at 14 mins

Comments _____

NORTH


SOUTH


EAST


WEST

CDM Smith

Project #:
County:
Division:

Observer's Name Matt Hunter

Date 8/11/16 Monitor Site # A3 (7)

travel lanes Cul de sac Direction of Lanes NB/SB

Speed limit 25 Surface Conditions HMA

Grade Flat Wind Speed 4 Humidity 70%

Surrounding Land uses Residential

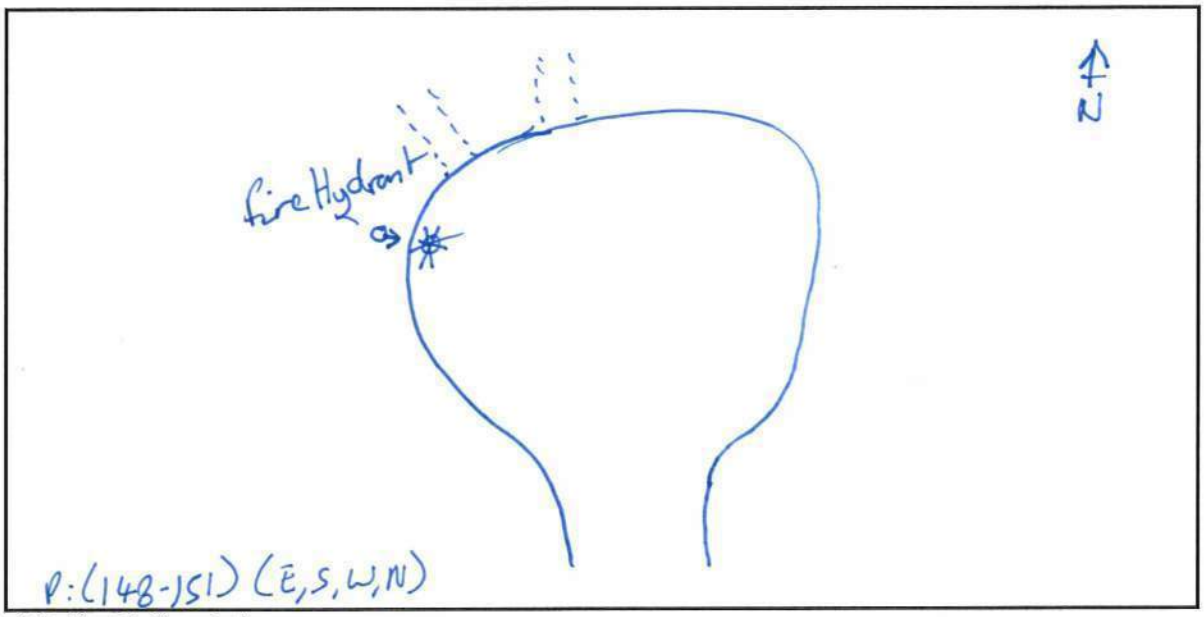
Time monitoring began 9:44 Time monitoring ended 9:59

Traffic # (15 min)	_____ Lane			_____ Lane		
Heavy Truck	_____	# _____	VPH	_____	# _____	VPH
Medium Truck	_____	# _____	VPH	_____	# _____	VPH
Cars	_____	# _____	VPH	_____	# _____	VPH
Total	_____	# _____	VPH	_____	# _____	VPH

VPH (volume per hour) Multiply by 4 to get hourly volumes

Leq Noise Level L(avg)_____ dB Distance from Travel Lane 0 ft

Height above roadway 4.5 ft Height above Ground 4.5 ft



Site Sketch if needed

Background Noise Sprinkler fountains / Birds

Major Noise Source N/A

Unusual Events N/A

Comments _____


NORTH


SOUTH


EAST


WEST

Ambient 1

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 10:08:57
Stop Time	Thursday, August 11, 2016 10:23:57

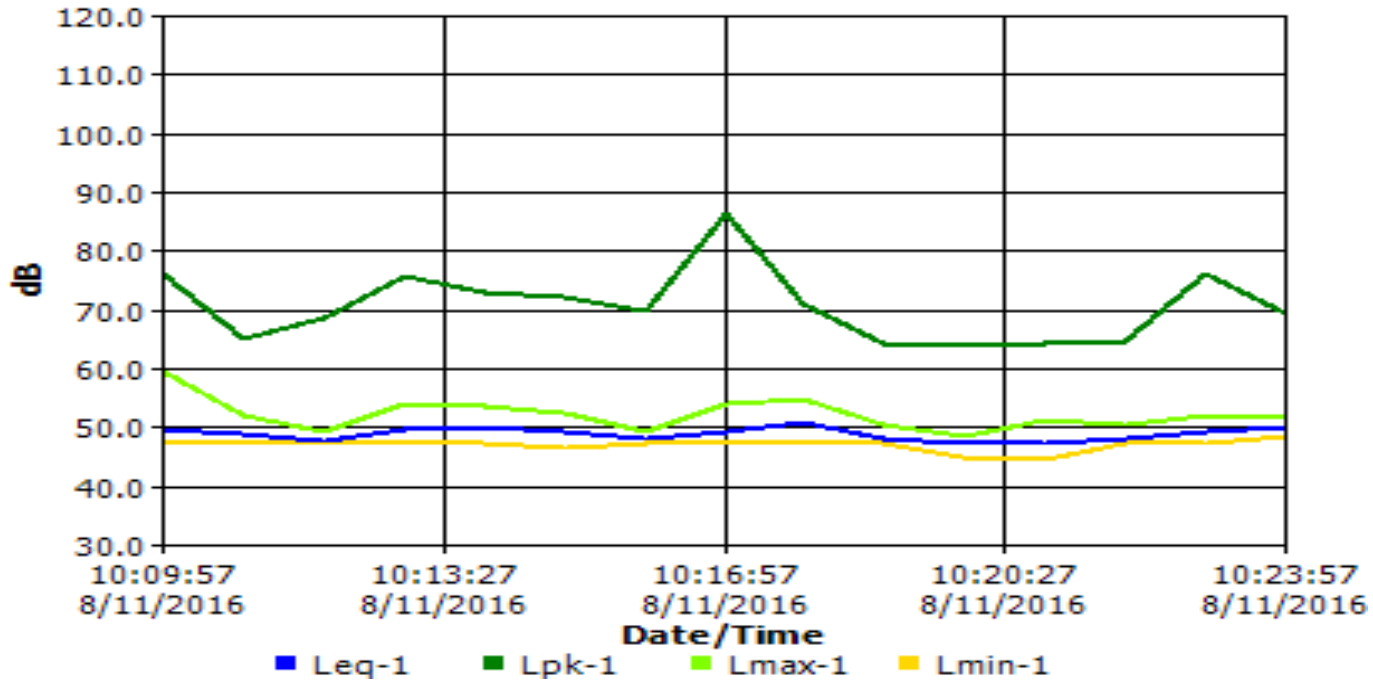
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	86.2 dB	Lmax	1	59.6 dB
Lmin	1	44.3 dB	Leq	1	48.8 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 10:09:57 AM	49.5	76.0	59.6	47.3
8/11/2016 10:10:57 AM	48.6	65.0	52.1	47.3
8/11/2016 10:11:57 AM	47.6	68.6	49.2	47.3
8/11/2016 10:12:57 AM	49.5	75.6	54.0	47.3
8/11/2016 10:13:57 AM	49.9	72.8	53.4	47.3
8/11/2016 10:14:57 AM	49.2	71.9	52.3	46.2
8/11/2016 10:15:57 AM	47.8	69.6	49.2	47.3
8/11/2016 10:16:57 AM	49.0	86.2	53.9	47.3
8/11/2016 10:17:57 AM	50.8	70.9	54.7	47.3
8/11/2016 10:18:57 AM	47.9	64.2	50.2	47.2
8/11/2016 10:19:57 AM	47.2	63.9	48.4	44.7
8/11/2016 10:20:57 AM	47.1	64.2	51.0	44.3
8/11/2016 10:21:57 AM	48.1	64.4	50.4	47.2
8/11/2016 10:22:57 AM	49.3	75.9	51.8	47.3
8/11/2016 10:23:57 AM	49.8	69.3	51.5	48.2

Logged Data Chart



Ambient 2

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 09:20:16
Stop Time	Thursday, August 11, 2016 09:35:16

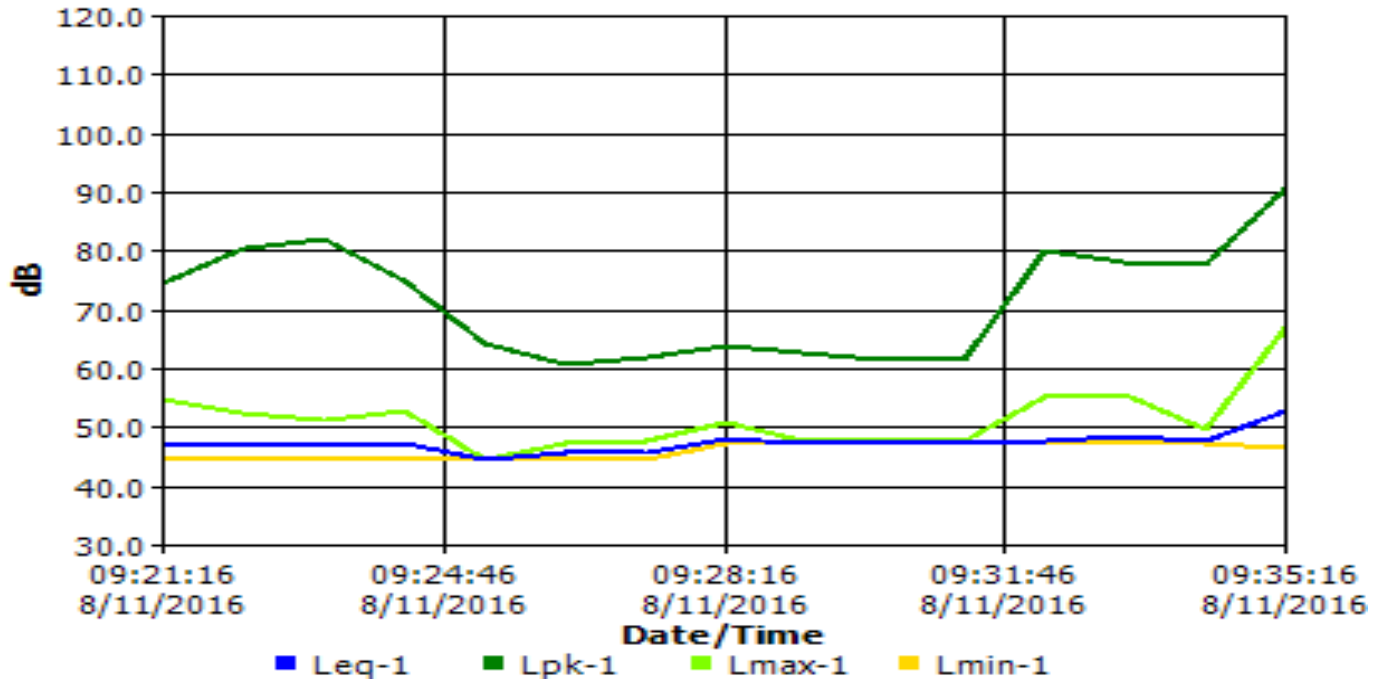
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	90.7 dB	Lmax	1	67 dB
Lmin	1	44.3 dB	Leq	1	47.7 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 9:21:16 AM	46.9	74.4	54.5	44.3
8/11/2016 9:22:16 AM	46.8	80.4	52.3	44.3
8/11/2016 9:23:16 AM	46.8	82.1	51.3	44.3
8/11/2016 9:24:16 AM	47.2	74.7	52.6	44.3
8/11/2016 9:25:16 AM	44.3	64.1	44.4	44.3
8/11/2016 9:26:16 AM	45.4	60.7	47.3	44.3
8/11/2016 9:27:16 AM	45.6	61.9	47.4	44.3
8/11/2016 9:28:16 AM	48.1	63.7	50.7	47.0
8/11/2016 9:29:16 AM	47.3	62.7	47.4	47.1
8/11/2016 9:30:16 AM	47.3	61.2	47.5	47.2
8/11/2016 9:31:16 AM	47.3	61.4	47.4	47.3
8/11/2016 9:32:16 AM	47.6	80.0	54.9	47.3
8/11/2016 9:33:16 AM	48.2	77.9	55.6	47.3
8/11/2016 9:34:16 AM	47.5	77.4	49.7	47.2
8/11/2016 9:35:16 AM	52.7	90.7	67.0	46.5

Logged Data Chart



Ambient 3

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 09:44:12
Stop Time	Thursday, August 11, 2016 09:59:12

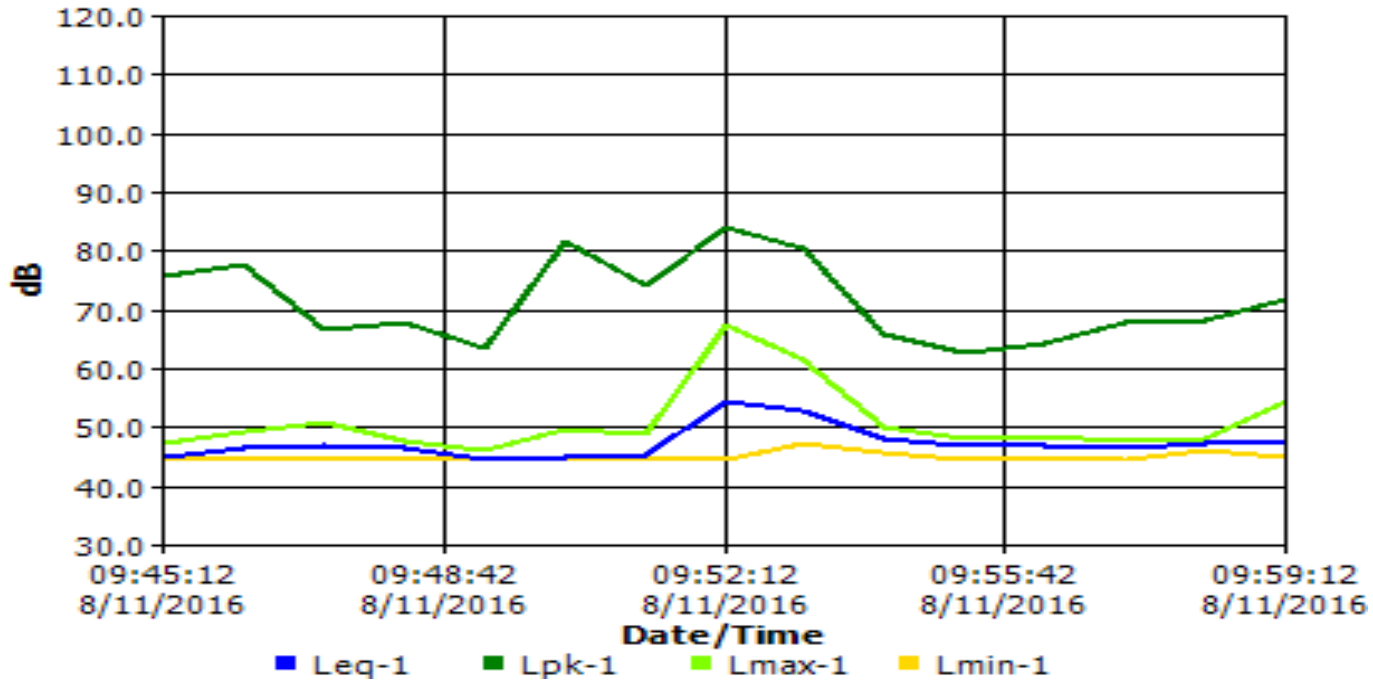
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	84 dB	Lmax	1	67.3 dB
Lmin	1	44.3 dB	Leq	1	48.3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 9:45:12 AM	44.8	75.7	47.3	44.3
8/11/2016 9:46:12 AM	46.4	77.4	49.2	44.3
8/11/2016 9:47:12 AM	46.7	66.5	50.9	44.3
8/11/2016 9:48:12 AM	46.2	67.8	47.4	44.3
8/11/2016 9:49:12 AM	44.3	63.4	46.0	44.3
8/11/2016 9:50:12 AM	44.8	81.6	49.7	44.3
8/11/2016 9:51:12 AM	45.1	74.0	48.7	44.3
8/11/2016 9:52:12 AM	54.4	84.0	67.3	44.3
8/11/2016 9:53:12 AM	52.8	80.5	61.5	47.1
8/11/2016 9:54:12 AM	47.8	65.9	50.1	45.6
8/11/2016 9:55:12 AM	46.8	62.6	47.8	44.3
8/11/2016 9:56:12 AM	46.8	64.3	48.5	44.3
8/11/2016 9:57:12 AM	46.2	67.8	47.4	44.3
8/11/2016 9:58:12 AM	47.0	68.2	48.0	45.9
8/11/2016 9:59:12 AM	47.3	71.5	54.4	44.8

Logged Data Chart



Validate 1

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 08:07:24
Stop Time	Thursday, August 11, 2016 08:22:24

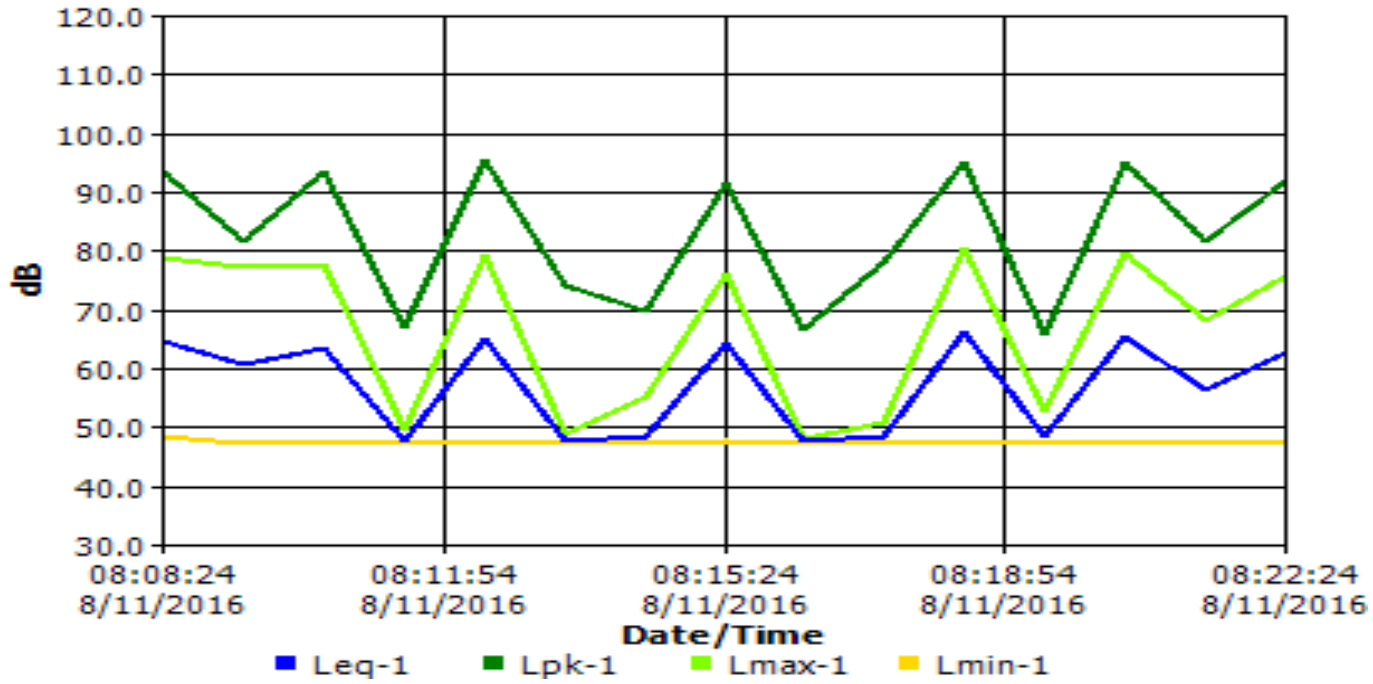
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	95.3 dB	Lmax	1	80.5 dB
Lmin	1	47.3 dB	Leq	1	61.6 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 8:08:24 AM	64.4	93.5	78.8	48.3
8/11/2016 8:09:24 AM	60.7	81.5	77.1	47.3
8/11/2016 8:10:24 AM	63.5	93.5	77.4	47.3
8/11/2016 8:11:24 AM	47.6	66.9	49.5	47.3
8/11/2016 8:12:24 AM	64.8	95.3	79.2	47.3
8/11/2016 8:13:24 AM	47.4	74.2	48.7	47.3
8/11/2016 8:14:24 AM	48.3	69.8	55.2	47.3
8/11/2016 8:15:24 AM	64.2	91.4	75.9	47.7
8/11/2016 8:16:24 AM	47.4	66.6	48.1	47.3
8/11/2016 8:17:24 AM	48.2	77.8	50.7	47.3
8/11/2016 8:18:24 AM	66.3	95.0	80.5	47.3
8/11/2016 8:19:24 AM	48.5	65.7	52.7	47.3
8/11/2016 8:20:24 AM	65.3	94.8	79.4	47.3
8/11/2016 8:21:24 AM	56.1	81.5	68.1	47.3
8/11/2016 8:22:24 AM	62.7	91.7	75.5	47.3

Logged Data Chart



Validate 2

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 08:30:09
Stop Time	Thursday, August 11, 2016 08:45:09

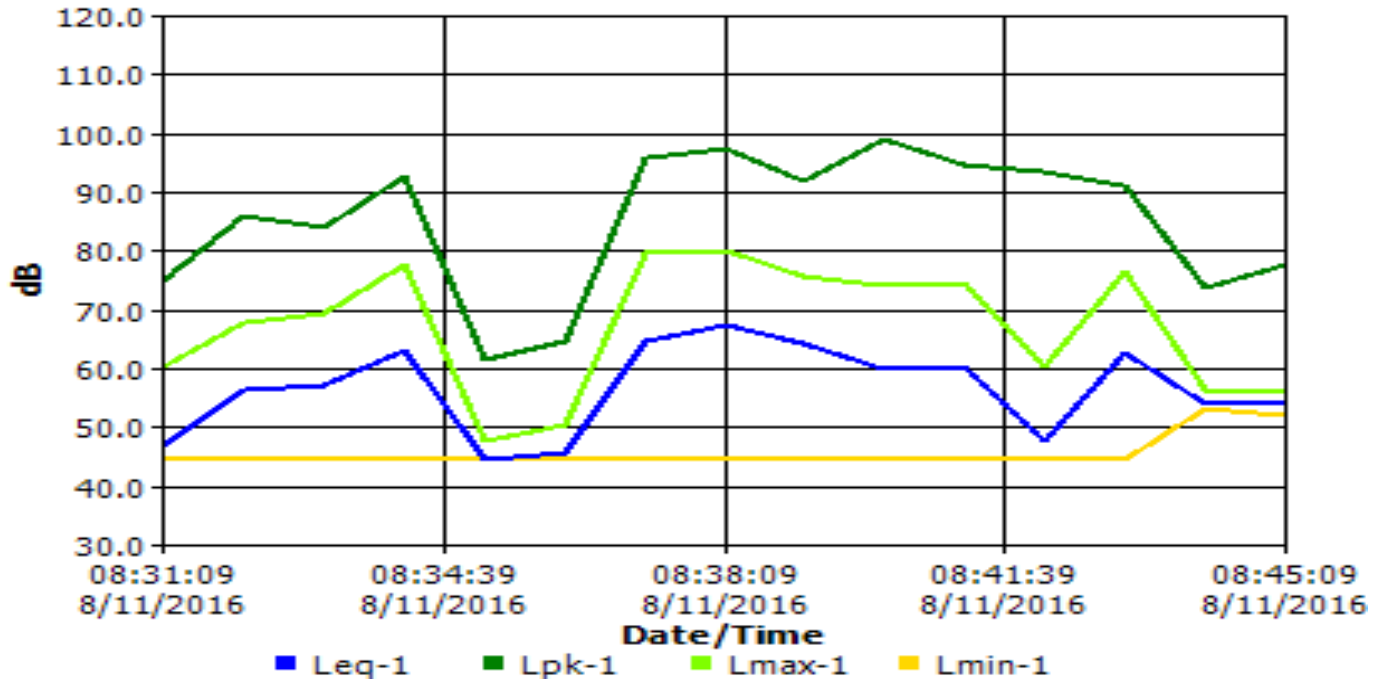
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	98.7 dB	Lmax	1	80.1 dB
Lmin	1	44.3 dB	Leq	1	60.8 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 8:31:09 AM	46.6	74.9	60.2	44.3
8/11/2016 8:32:09 AM	56.4	85.7	67.8	44.3
8/11/2016 8:33:09 AM	56.9	83.7	69.4	44.3
8/11/2016 8:34:09 AM	62.9	92.6	77.6	44.3
8/11/2016 8:35:09 AM	44.5	61.5	47.4	44.3
8/11/2016 8:36:09 AM	45.6	64.5	50.5	44.3
8/11/2016 8:37:09 AM	64.5	95.7	79.7	44.3
8/11/2016 8:38:09 AM	67.5	97.3	80.1	44.3
8/11/2016 8:39:09 AM	64.1	91.9	75.6	44.3
8/11/2016 8:40:09 AM	59.7	98.7	74.0	44.3
8/11/2016 8:41:09 AM	60.3	94.5	74.6	44.3
8/11/2016 8:42:09 AM	47.7	93.3	60.1	44.3
8/11/2016 8:43:09 AM	62.6	90.9	76.4	44.3
8/11/2016 8:44:09 AM	53.9	73.7	56.3	53.2
8/11/2016 8:45:09 AM	53.9	77.7	55.9	52.0

Logged Data Chart



Validate 3

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 08:53:04
Stop Time	Thursday, August 11, 2016 09:08:04

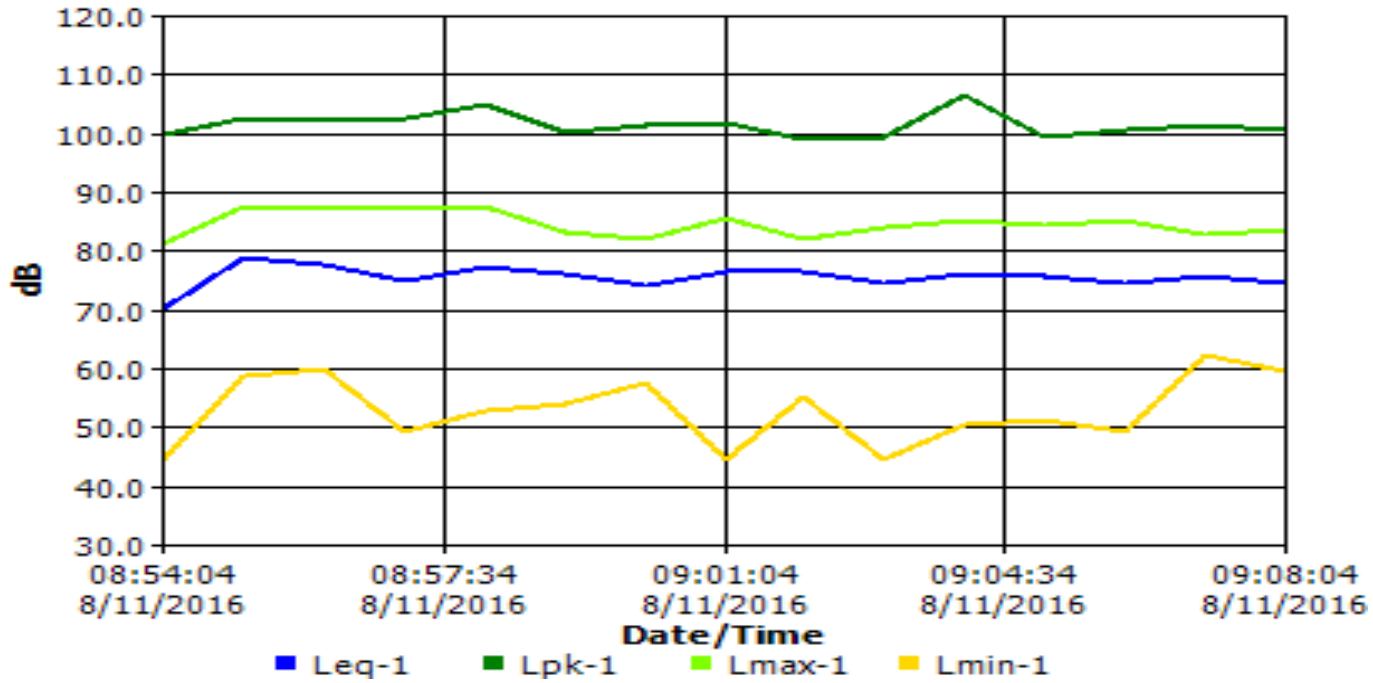
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	106.3 dB	Lmax	1	87.5 dB
Lmin	1	44.3 dB	Leq	1	75.7 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 8:54:04 AM	70.2	99.5	81.0	44.3
8/11/2016 8:55:04 AM	78.8	102.6	87.4	58.8
8/11/2016 8:56:04 AM	77.5	102.1	87.1	59.7
8/11/2016 8:57:04 AM	74.8	102.3	86.9	49.0
8/11/2016 8:58:04 AM	77.0	104.8	87.5	52.8
8/11/2016 8:59:04 AM	75.9	100.1	83.2	53.8
8/11/2016 9:00:04 AM	74.1	101.4	82.0	57.4
8/11/2016 9:01:04 AM	76.2	101.5	85.6	44.3
8/11/2016 9:02:04 AM	76.2	98.8	81.8	54.9
8/11/2016 9:03:04 AM	74.6	99.4	83.9	44.3
8/11/2016 9:04:04 AM	75.8	106.3	85.2	50.3
8/11/2016 9:05:04 AM	75.5	99.1	84.4	51.2
8/11/2016 9:06:04 AM	74.3	100.4	85.0	49.0
8/11/2016 9:07:04 AM	75.4	101.3	82.6	62.3
8/11/2016 9:08:04 AM	74.5	100.6	83.3	59.6

Logged Data Chart



Validate 4

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 07:19:51
Stop Time	Thursday, August 11, 2016 07:34:51

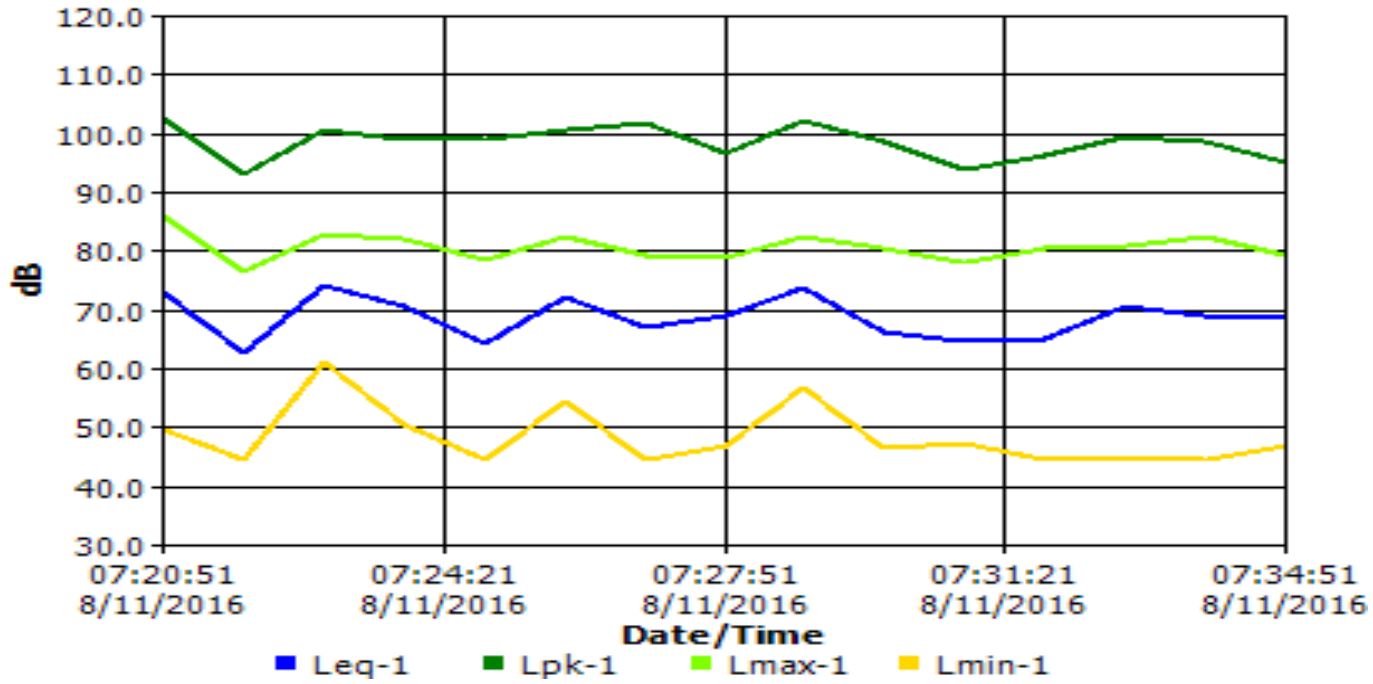
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	102.5 dB	Lmax	1	85.8 dB
Lmin	1	44.3 dB	Leq	1	69.8 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 7:20:51 AM	72.8	102.5	85.8	49.5
8/11/2016 7:21:51 AM	62.4	93.0	76.2	44.3
8/11/2016 7:22:51 AM	73.9	100.4	82.6	61.0
8/11/2016 7:23:51 AM	70.4	98.8	82.0	50.3
8/11/2016 7:24:51 AM	64.2	98.7	78.3	44.3
8/11/2016 7:25:51 AM	72.1	100.5	82.4	54.2
8/11/2016 7:26:51 AM	67.1	101.6	79.3	44.3
8/11/2016 7:27:51 AM	68.8	96.5	78.9	46.8
8/11/2016 7:28:51 AM	73.6	101.9	82.4	56.6
8/11/2016 7:29:51 AM	66.0	98.6	80.5	46.4
8/11/2016 7:30:51 AM	64.5	93.7	78.1	47.3
8/11/2016 7:31:51 AM	64.9	96.2	80.4	44.3
8/11/2016 7:32:51 AM	70.4	99.1	80.6	44.3
8/11/2016 7:33:51 AM	69.0	98.5	82.4	44.3
8/11/2016 7:34:51 AM	68.5	95.1	79.2	46.9

Logged Data Chart



Validate 5

8/11/2016

Study 1

Information Panel

Name	Study 1
Start Time	Thursday, August 11, 2016 07:44:44
Stop Time	Thursday, August 11, 2016 07:59:44

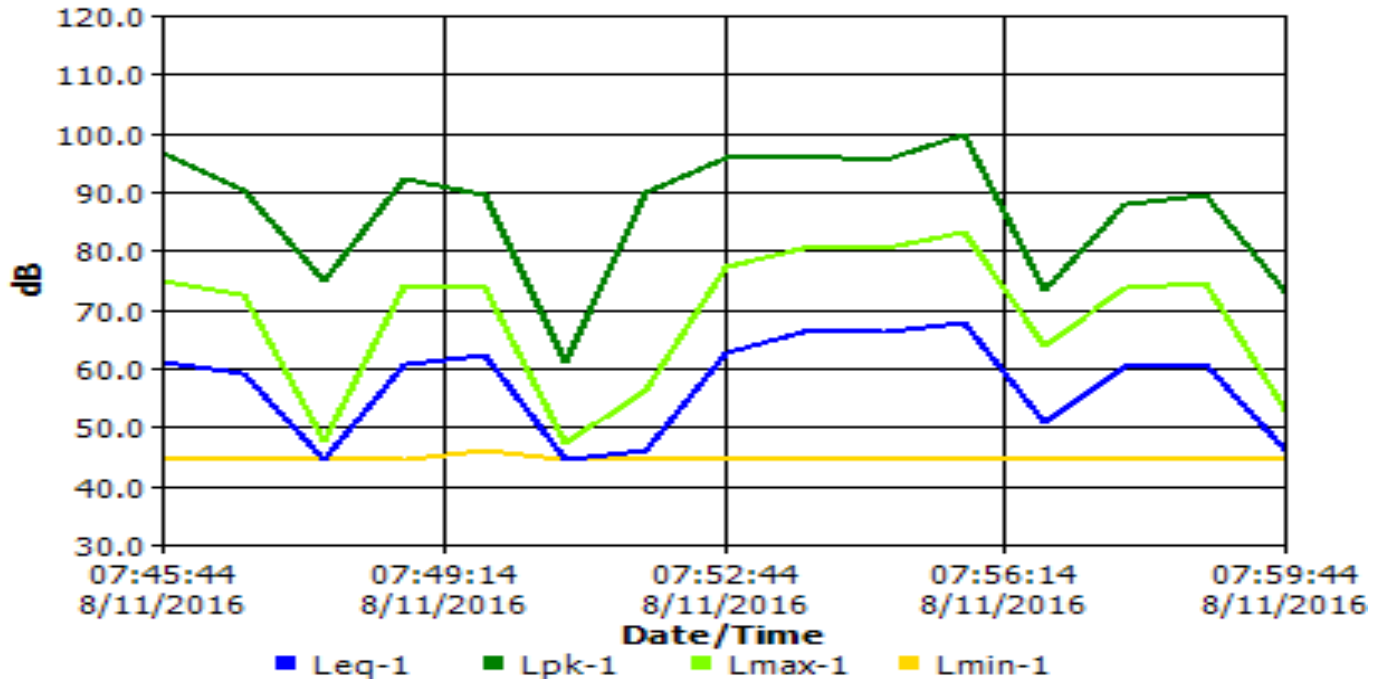
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	99.7 dB	Lmax	1	83 dB
Lmin	1	44.3 dB	Leq	1	61.8 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/3	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1
8/11/2016 7:45:44 AM	61.0	96.6	74.8	44.3
8/11/2016 7:46:44 AM	59.2	90.1	72.6	44.3
8/11/2016 7:47:44 AM	44.5	74.9	47.4	44.3
8/11/2016 7:48:44 AM	60.4	92.2	74.2	44.3
8/11/2016 7:49:44 AM	62.3	89.3	73.5	46.0
8/11/2016 7:50:44 AM	44.4	60.8	47.1	44.3
8/11/2016 7:51:44 AM	46.1	89.7	56.4	44.3
8/11/2016 7:52:44 AM	62.5	95.6	77.1	44.3
8/11/2016 7:53:44 AM	66.2	96.2	80.3	44.3
8/11/2016 7:54:44 AM	66.0	95.4	80.5	44.3
8/11/2016 7:55:44 AM	67.7	99.7	83.0	44.3
8/11/2016 7:56:44 AM	50.8	73.1	63.9	44.3
8/11/2016 7:57:44 AM	60.3	88.0	73.5	44.3
8/11/2016 7:58:44 AM	60.6	89.6	74.6	44.3
8/11/2016 7:59:44 AM	46.1	73.0	52.8	44.3

Logged Data Chart



WILNER-GREENE ASSOCIATES INC
INSTRUMENTATION AND CALIBRATIONS
an ISO 9001:2000 Company

CERTIFICATE OF CALIBRATION

Certificate Number 355889 - 116769

Issued To:	Equipment:	
CAMP DRESSER & McKEE INC. ONE CAMBRIDGE PLACE 153 SOUTH ST SOMERVILLE, MA 02143	Manufacturer: QUEST Model Number: SP-DL-1-1/3 SerialNumber: BLG040005 ControlNumber	DateReceived: 9/2/2015 DateCalibrated 9/2/2015 Next Calibration Due: Sep 2016

Test Conditions :

Temperature: 24.7 deg C RelativeHumidity: 53 % BarometricPressure: 1015 mBar

Condition Received:
DAMAGED MICROPHONE DIAPHRAGM. OTHERWISE IN TOLERANCE.

Condition Returned:
FULLY FUNCTIONAL AND WITHIN TOLERANCE.

Special Conditions:
NONE

Work Performed:
REPLACED MICROPHONE. CALIBRATED PER CALIBRATION PROCEDURE WG-SL-005.

Specification: CALIBRATED TO ANSI S1.11-2004 ANSI 1.43 -1997 TYPE 1

Reference Standards Used
Asset Number, Device, Report Number, Date Next Calibration Due

219, HEWLET-PACKARD 8903B, AUDIO ANALYZER, 1212495, 8/31/2016

277, B&K 4144, 1" CONDENSER MICROPHONE 200V POL, 25300-1, 5/11/2016

501, SOUNDPRO SE-SP-1-1/3, TYPE 1 SOUND LEVEL METER AND 1/1 OB RTA, 354802-113832, 9/10/2015

71, QUEST QC-20, ACOUSTIC CALIBRATOR, 354802-113833, 9/10/2015

74, FLUKE 8050A, DIGITAL MULTIMETER, 1212496, 8/31/2016

506, SP SE-1-1/1, , 1508190226BEP080001, 8/19/2016

MeasurementUncertainties: ACOUSTIC 1.0 DB, FREQUENCY +/- 0.1 HZ, DC VOLTAGE 0.1%, AC VOLTAGE 0.5%

Calibrated and Reviewed by _____ _____ 9/2/2015

Authorized Signature

This report certifies that all calibration equipment used in the test is traceable to the National Institue of Standards (NIST) , and applies only to the unit identified under "Equipment" above. This report must not be reproduced except in it's entirety without the written approval of Wilner-Greene Associates.

Appendix B

MDOT Noise Analysis and Abatement Handbook

MDOT Highway Noise Analysis and Abatement Handbook

Return to Traffic Noise Home Page

Appendix C

Noise Analysis Results

Dort Highway Extension

Table C-1. Identification of Receptors & Existing and Predicted Noise Levels

Receptor ID	Address	Dwelling Units or # Receptors	NAC Category	Existing Noise Level	Build Option 1	Option 1 Change in Noise Level	Build Option 2	Option 2 Change in Noise Level	Build Option 3 McWain	Option 3 McWain Change in Noise
R1	2356 E COOK RD	1	B	59	60	1	60	1	61	2
R2	9084 MCWAIN RD	1	B	52	54	2	53	1	60	8
R3	9302 MCWAIN RD	1	B	48	49	1	49	1	55	7
R4	9130 MCWAIN RD	1	B	47	49	2	49	2	53	6
R5	2349 E COOK RD	1	B	59	59	0	59	0	60	1
R6	9204 VILLAGE WOODS CT	1	B	47	49	2	49	2	51	4
R7	9212 VILLAGE WOODS CT	1	B	47	50	3	48	1	52	5
R8	9228 VILLAGE WOODS CT	1	B	47	49	2	47	0	51	4
R9	2372 VILLAGE WOODS DR	1	B	47	49	2	48	1	53	6
R10	2359 E COOK RD	1	B	57	58	1	58	1	59	2
R11	2345 E BALDWIN RD	1	B	50	51	1	52	2	53	3
R12	2366 E COOK RD	1	B	61	61	0	61	0	62	1
R13	2386 VILLAGE WOODS DR	1	B	48	50	2	49	1	54	6
R14	2365 LAKE RIDGE DR	1	B	51	52	1	51	0	53	2
R15	9204 MCWAIN RD	1	B	50	52	2	52	2	59	9
R16	10035 MULBERRY LN	1	B	53	55	2	55	2	56	3
R17	2368 LAKE RIDGE DR	1	B	51	52	1	51	0	53	2
R18	9070 MCWAIN RD	1	B	53	54	1	54	1	60	7
R19	9230 MCWAIN RD	1	B	52	54	2	54	2	61	9
R20	9050 MCWAIN RD	1	B	54	55	1	55	1	61	7
R21	9140 MCWAIN RD	1	B	50	52	2	52	2	58	8
R22	9156 MCWAIN RD	1	B	50	52	2	52	2	58	8
R23	9166 MCWAIN RD	1	B	50	51	1	51	1	58	8
R24	9030 MCWAIN RD	1	B	56	57	1	57	1	61	5
R25	9124 MCWAIN RD	1	B	50	52	2	52	2	58	8
R26	10039 MULBERRY LN	1	B	56	58	2	58	2	59	3
R27	2384 E COOK RD	1	B	61	62	1	62	1	64	3
R28	9104 MCWAIN RD	1	B	51	53	2	52	1	59	8

Dort Highway Extension

Table C-1. Identification of Receptors & Existing and Predicted Noise Levels

Receptor ID	Address	Dwelling Units or # Receptors	NAC Category	Existing Noise Level	Build Option 1	Option 1 Change in Noise Level	Build Option 2	Option 2 Change in Noise Level	Build Option 3 McWain	Option 3 McWain Change in Noise
R29	9040 MCWAIN RD	1	B	54	56	2	55	1	61	7
R30	9176 MCWAIN RD	1	B	52	54	2	54	2	61	9
R31	9186 MCWAIN RD	1	B	52	54	2	54	2	61	9
R32	9214 MCWAIN RD	1	B	52	54	2	54	2	61	9
R33	9250 MCWAIN RD	1	B	52	54	2	54	2	61	9
R34	9404 MCWAIN RD	1	B	50	52	2	52	2	59	9
R35	9424 MCWAIN RD	1	B	51	51	0	51	0	59	8
R36	9472 MCWAIN RD	1	B	51	53	2	53	2	59	8
R37	2375 E COOK RD	1	B	56	57	1	57	1	65	9
R38	9069 MCWAIN RD	1	B	55	56	1	56	1	64	9
R39	9021 MCWAIN RD	1	B	58	59	1	60	2	64	6
R40	9033 MCWAIN RD	1	B	56	57	1	58	2	63	7
R41	9045 MCWAIN RD	1	B	55	56	1	56	1	63	8
R42	9065 MCWAIN RD	1	B	55	57	2	56	1	64	9
R43	**2404 POLLOCK RD**	1	B	57	58	1	58	1	**67**	10
R44	2407 POLLOCK RD	1	B	56	58	2	58	2	65	9
R45	**2401 LINDSAY LN**	1	B	55	56	1	56	1	**65**	10
R46	**9317 MCWAIN RD**	1	B	55	56	1	56	1	**65**	10
R47	2409 E COOK RD	1	B	57	58	1	57	0	61	4
R48	9187 MCWAIN RD	1	B	52	53	1	54	2	60	8
R49	9197 MCWAIN RD	1	B	52	53	1	53	1	60	8
R50	9209 MCWAIN RD	1	B	52	53	1	53	1	60	8
R51	9225 MCWAIN RD	1	B	52	53	1	53	1	60	8
R52	9235 MCWAIN RD	1	B	51	53	2	53	2	60	9
R53	2414 POLLOCK RD	1	B	53	54	1	55	2	60	7
R54	2424 E COOK RD	1	B	60	61	1	61	1	62	2
R55	9479 MCWAIN RD	1	B	54	55	1	55	1	62	8
R56	2417 POLLOCK RD	1	B	52	54	2	54	2	58	6

Dort Highway Extension

Table C-1. Identification of Receptors & Existing and Predicted Noise Levels

Receptor ID	Address	Dwelling Units or # Receptors	NAC Category	Existing Noise Level	Build Option 1	Option 1 Change in Noise Level	Build Option 2	Option 2 Change in Noise Level	Build Option 3 McWain	Option 3 McWain Change in Noise
R57	9497 MCWAIN RD	1	B	56	58	2	58	2	62	6
R58	**2405 E BALDWIN RD**	1	B	64	**66**	2	**66**	2	**67**	3
R59	9034 CREEKVIEW CT	1	B	53	54	1	55	2	56	3
R60	2411 LINDSAY LN	1	B	50	52	2	52	2	57	7
R61	2412 LINDSAY LN	1	B	50	51	1	51	1	57	7
R62	9157 MCWAIN RD	1	B	50	52	2	53	3	58	8
R63	9135 MCWAIN RD	1	B	52	54	2	53	1	60	8
R64	9024 CREEKVIEW CT	1	B	55	56	1	56	1	57	2
R65	2424 POLLOCK RD	1	B	51	53	2	53	2	57	6
R66	9119 MCWAIN RD	1	B	50	51	1	51	1	56	6
R67	9042 CREEKVIEW CT	1	B	52	54	2	53	1	54	2
R68	9099 MCWAIN RD	1	B	50	52	2	51	1	56	6
R69	2434 E COOK RD	1	B	60	61	1	61	1	61	1
R70	2431 POLLOCK RD	1	B	51	53	2	54	3	56	5
R71	2421 LINDSAY LN	1	B	49	51	2	51	2	55	6
R72	2422 LINDSAY LN	1	B	49	50	1	51	2	54	5
R73	2434 POLLOCK RD	1	B	51	53	2	53	2	55	4
R74	2431 LINDSAY LN	1	B	49	51	2	51	2	53	4
R75	2432 LINDSAY LN	1	B	48	50	2	51	3	53	5
R76	2444 POLLOCK RD	1	B	51	53	2	53	2	54	3
R77	2441 POLLOCK RD	1	B	51	53	2	53	2	55	4
R78	2427 E BALDWIN RD	1	B	56	58	2	58	2	59	3
R79	2454 E COOK RD	1	B	60	61	1	61	1	61	1
R80	2450 POLLOCK RD	1	B	52	54	2	54	2	55	3
R81	2466 E COOK RD	1	B	58	59	1	59	1	59	1
R82	9035 CREEKVIEW CT	1	B	53	55	2	54	1	54	1
R83	9347 MCWAIN RD	1	B	48	49	1	50	2	54	6
R84	9393 MCWAIN RD	1	B	48	49	1	50	2	53	5

Dort Highway Extension

Table C-1. Identification of Receptors & Existing and Predicted Noise Levels

Receptor ID	Address	Dwelling Units or # Receptors	NAC Category	Existing Noise Level	Build Option 1	Option 1 Change in Noise Level	Build Option 2	Option 2 Change in Noise Level	Build Option 3 McWain	Option 3 McWain Change in Noise
R85	2476 E COOK RD	1	B	55	57	2	56	1	56	1
R86	9415 MCWAIN RD	1	B	49	50	1	50	1	56	7
R87	2488 E COOK RD	1	B	55	58	3	56	1	55	0
R88	2573 E COOK RD	1	B	61	63	2	63	2	62	1
R89	2506 POLLOCK RD	1	B	51	55	4	55	4	54	3
R90	9157 TIMBERLINE DR	1	B	49	56	7	54	5	50	1
R91	2503 LINDSAY LN	1	B	50	54	4	53	3	52	2
R92	**2510 E COOK RD**	1	B	57	**66**	9	58	1	58	1
R93	2506 LINDSAY LN	1	B	46	52	6	52	6	49	3
R94	9177 TIMBERLINE DR	1	B	48	54	6	54	6	49	1
R95	9187 TIMBERLINE DR	1	B	48	55	7	54	6	49	1
R96	9167 TIMBERLINE DR	1	B	48	54	6	54	6	50	2
R97	9199 TIMBERLINE DR	1	B	48	53	5	56	8	50	2
R98	9207 TIMBERLINE DR	1	B	47	54	7	53	6	49	2
R99	9217 TIMBERLINE DR	1	B	47	54	7	53	6	49	2
R100	9227 TIMBERLINE DR	1	B	47	54	7	54	7	49	2
R101	9239 TIMBERLINE DR	1	B	48	54	6	54	6	50	2
R102	2523 POLLOCK RD	1	B	53	57	4	57	4	56	3
R103	2511 LINDSAY LN	1	B	49	54	5	54	5	51	2
R104	2516 LINDSAY LN	1	B	46	55	9	54	8	49	3
R105	**3035 E COOK RD**	1	B	68	**69**	1	**70**	2	**69**	1
R106	3020 POLLOCK RD	1	B	51	R/W Aqusition	-	R/W Aqusition	-	54	3
R107	3030 POLLOCK RD	1	B	51	R/W Aqusition	-	R/W Aqusition	-	54	3
R108	3050 POLLOCK RD	1	B	51	60	9	60	9	54	3
R109	3060 POLLOCK RD	1	B	51	59	8	59	8	54	3
R110	3070 POLLOCK RD	1	B	51	58	7	58	7	54	3
R111	**3107 E BALDWIN RD**	1	B	65	**68**	3	**67**	2	**67**	2
R112	8386 NORTH OAKS CT	2	B	53	54	1	53	0	52	-1

Dort Highway Extension

Table C-1. Identification of Receptors & Existing and Predicted Noise Levels

Receptor ID	Address	Dwelling Units or # Receptors	NAC Category	Existing Noise Level	Build Option 1	Option 1 Change in Noise Level	Build Option 2	Option 2 Change in Noise Level	Build Option 3 McWain	Option 3 McWain Change in Noise
R113	8381 CROSSBOW CT	3	B	52	52	0	52	0	52	0
R114	8384 CROSSBOW CT	4	B	49	49	0	49	0	49	0
R115	8403 NOOR DR	5	B	48	49	1	48	0	49	1
R116	8400 CROSSBOW CT	6	B	49	50	1	48	-1	49	0
R117	8397 CROSSBOW CT	7	B	50	51	1	50	0	50	0
R118	2355 LAKE RIDGE DR	8	B	49	51	2	50	1	51	2
R119	2343 LAKE RIDGE DR	9	B	51	52	1	51	0	52	1
R120	2331 LAKE RIDGE DR	10	B	51	52	1	51	0	52	1
R121	2323 LAKE RIDGE DR	11	B	49	50	1	49	0	50	1
R122	2317 LAKE RIDGE DR	12	B	49	50	1	50	1	51	2
R123	2305 LAKE RIDGE DR	13	B	49	50	1	50	1	50	1
R124	2297 LAKE RIDGE DR	14	B	49	50	1	49	0	50	1
R125	2302 LAKE RIDGE DR	15	B	48	49	1	48	0	51	3
R126	8488 GRAND VIEW DR	16	B	49	50	1	49	0	51	2
R127	8494 GRAND VIEW DR	17	B	50	51	1	50	0	52	2
R128	2295 HIDDEN FOREST DR	18	B	49	50	1	50	1	51	2
R129	2285 HIDDEN FOREST DR	19	B	49	50	1	49	0	51	2
R130	8504 HIDDEN FOREST DR	20	B	52	52	0	52	0	53	1
R131	8510 HIDDEN FOREST CT	21	B	55	55	0	55	0	55	0
R132	8516 HIDDEN FOREST CT	22	B	62	63	1	63	1	63	1
R133	8511 HIDDEN FOREST CT	23	B	58	59	1	59	1	59	1
R134	2300 HIDDEN FOREST DR	24	B	53	53	0	53	0	54	1
R135	8502 GRAND VIEW DR	25	B	52	53	1	53	1	54	2
R136	8508 GRAND VIEW DR	26	B	55	56	1	56	1	57	2
R137	8514 GRAND VIEW DR	27	B	62	63	1	63	1	63	1
R138	8485 GRAND VIEW DR	28	B	49	50	1	49	0	51	2
R139	2332 LAKE RIDGE DR	29	B	49	51	2	50	1	51	2
R140	2344 LAKE RIDGE DR	30	B	50	51	1	50	0	52	2

Dort Highway Extension

Table C-1. Identification of Receptors & Existing and Predicted Noise Levels

Receptor ID	Address	Dwelling Units or # Receptors	NAC Category	Existing Noise Level	Build Option 1	Option 1 Change in Noise Level	Build Option 2	Option 2 Change in Noise Level	Build Option 3 McWain	Option 3 McWain Change in Noise
R141	8491 GRAND VIEW DR	31	B	50	52	2	51	1	52	2
R142	8497 GRAND VIEW DR	32	B	51	52	1	51	0	52	1
R143	8503 GRAND VIEW DR	33	B	52	53	1	53	1	54	2
R144	8509 GRAND VIEW DR	34	B	55	55	0	55	0	56	1
R145	8515 GRAND VIEW DR	35	B	62	62	0	62	0	63	1
R146	9043 CREEKVIEW CT	36	B	52	55	3	53	1	54	2
R147	9154 TIMBERLINE DR	37	B	48	51	3	53	5	50	2
R148	9176 TIMBERLINE DR	38	B	47	54	7	53	6	49	2
R149	9186 TIMBERLINE DR	39	B	47	54	7	53	6	49	2
R150	9196 TIMBERLINE DR	40	B	49	53	4	53	4	50	1
R151	9210 TIMBERLINE CT	41	B	48	52	4	52	4	50	2
R152	9214 TIMBERLINE CT	42	B	48	51	3	51	3	50	2
R153	9216 TIMBERLINE CT	43	B	48	51	3	50	2	51	3
R154	9212 TIMBERLINE CT	44	B	48	51	3	51	3	50	2
R155	9218 TIMBERLINE CT	45	B	47	50	3	51	4	51	4
R156	9220 TIMBERLINE CT	46	B	47	50	3	51	4	50	3
R157	9222 TIMBERLINE CT	47	B	47	51	4	50	3	50	3
R158	9224 TIMBERLINE CT	48	B	47	51	4	51	4	50	3
R159	9226 TIMBERLINE CT	49	B	47	51	4	51	4	49	2
R160	2511 POLLOCK RD	50	B	53	56	3	56	3	56	3
R161	2495 POLLOCK RD	51	B	50	54	4	53	3	53	3
R162	2459 POLLOCK RD	52	B	50	53	3	53	3	53	3
R163	9215 VILLAGE WOODS CT	53	B	46	49	3	47	1	49	3
R164	9225 VILLAGE WOODS CT	54	B	47	48	1	47	0	50	3
R165	2361 VILLAGE WOODS DR	55	B	46	48	2	46	0	49	3
R166	2351 VILLAGE WOODS DR	56	B	46	48	2	47	1	49	3
R167	2343 VILLAGE WOODS DR	57	B	46	48	2	46	0	49	3
R168	2362 VILLAGE WOODS DR	58	B	47	49	2	47	0	50	3

Dort Highway Extension

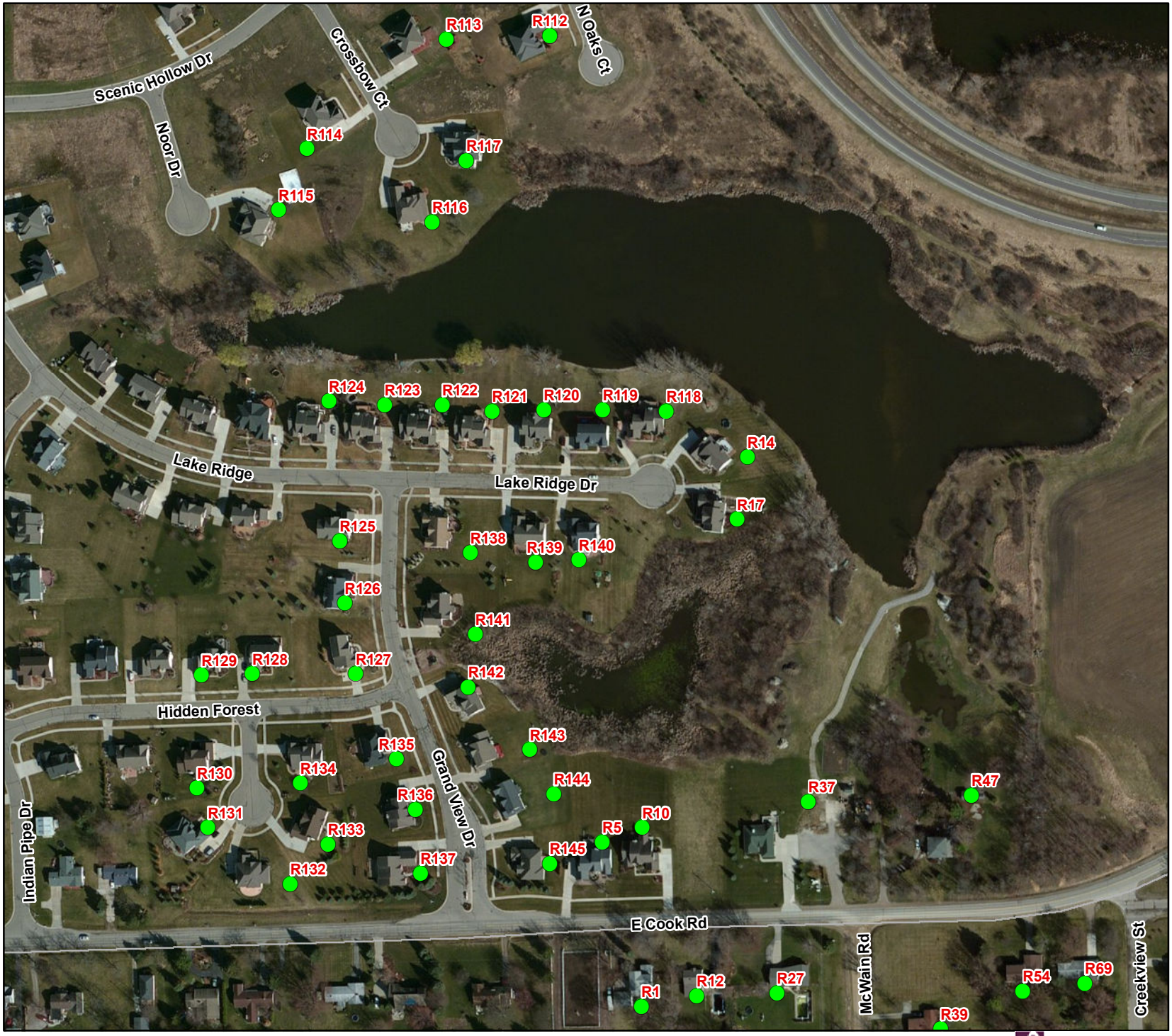
Table C-1. Identification of Receptors & Existing and Predicted Noise Levels

Receptor ID	Address	Dwelling Units or # Receptors	NAC Category	Existing Noise Level	Build Option 1	Option 1 Change in Noise Level	Build Option 2	Option 2 Change in Noise Level	Build Option 3 McWain	Option 3 McWain Change in Noise
R169	2352 VILLAGE WOODS DR	59	B	47	49	2	47	0	50	3
R170	2342 VILLAGE WOODS DR	60	B	46	48	2	46	0	49	3
R171	9200 VILLAGE WOODS CT	61	B	46	48	2	48	2	51	5
R172	2214 VILLAGE WOODS DR	62	B	46	48	2	48	2	49	3
R173	2458 POLLOCK RD	63	B	51	53	2	53	2	54	3
R174	2443 LINDSAY LN	64	B	49	51	2	52	3	53	4
R175	2455 LINDSAY LN	65	B	50	51	1	52	2	52	2
R176	2475 LINDSAY LN	66	B	49	51	2	51	2	52	3
R177	2485 LINDSAY LN	67	B	50	51	1	52	2	52	2
R178	2496 LINDSAY LN	68	B	48	51	3	51	3	50	2
R179	2486 LINDSAY LN	69	B	48	51	3	51	3	50	2
R180	2474 LINDSAY LN	70	B	49	51	2	51	2	51	2
R181	2464 LINDSAY LN	71	B	50	50	0	51	1	52	2
R182	2454 LINDSAY LN	72	B	49	50	1	51	2	52	3
R183	2444 LINDSAY LN	73	B	48	50	2	51	3	52	4
R184	3090 POLLOCK RD	74	B	54	58	4	58	4	56	2

Dort Highway Extension

Genesee County, MI

Option 1
Noise Results

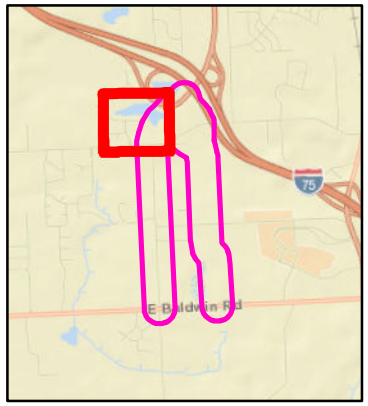


Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 1
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



0 125 250 500 750 1,000 Feet

1 inch = 250 feet

CDM Smith

WadeTrim

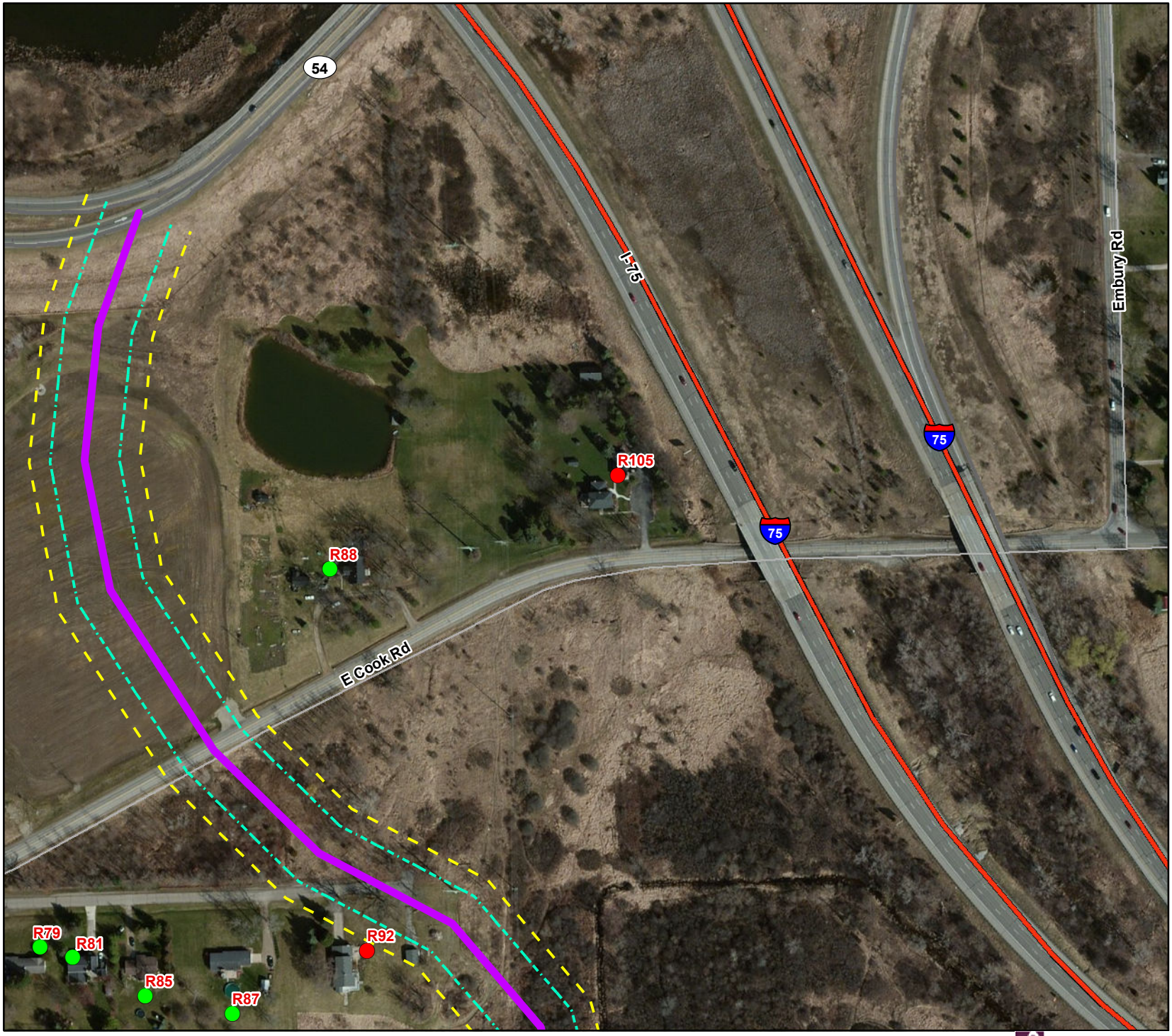
Rowe Professional Services Company

Figure C1

Dort Highway Extension

Genesee County, MI

Option 1 Noise Results

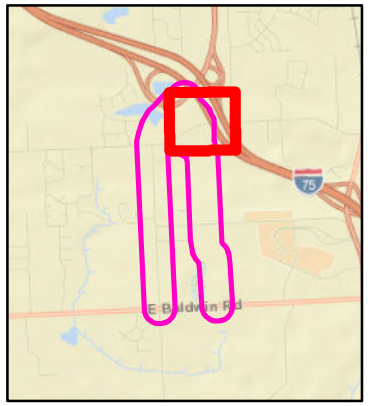


Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 1
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



0 125 250 500 750 1,000 Feet

1 inch = 250 feet

CDM Smith

WadeTrim

Rowe Professional Services Company

Figure C2

Dort Highway Extension

Genesee County, MI

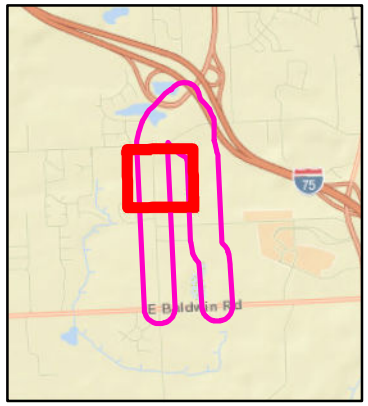
Option 1
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 1
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



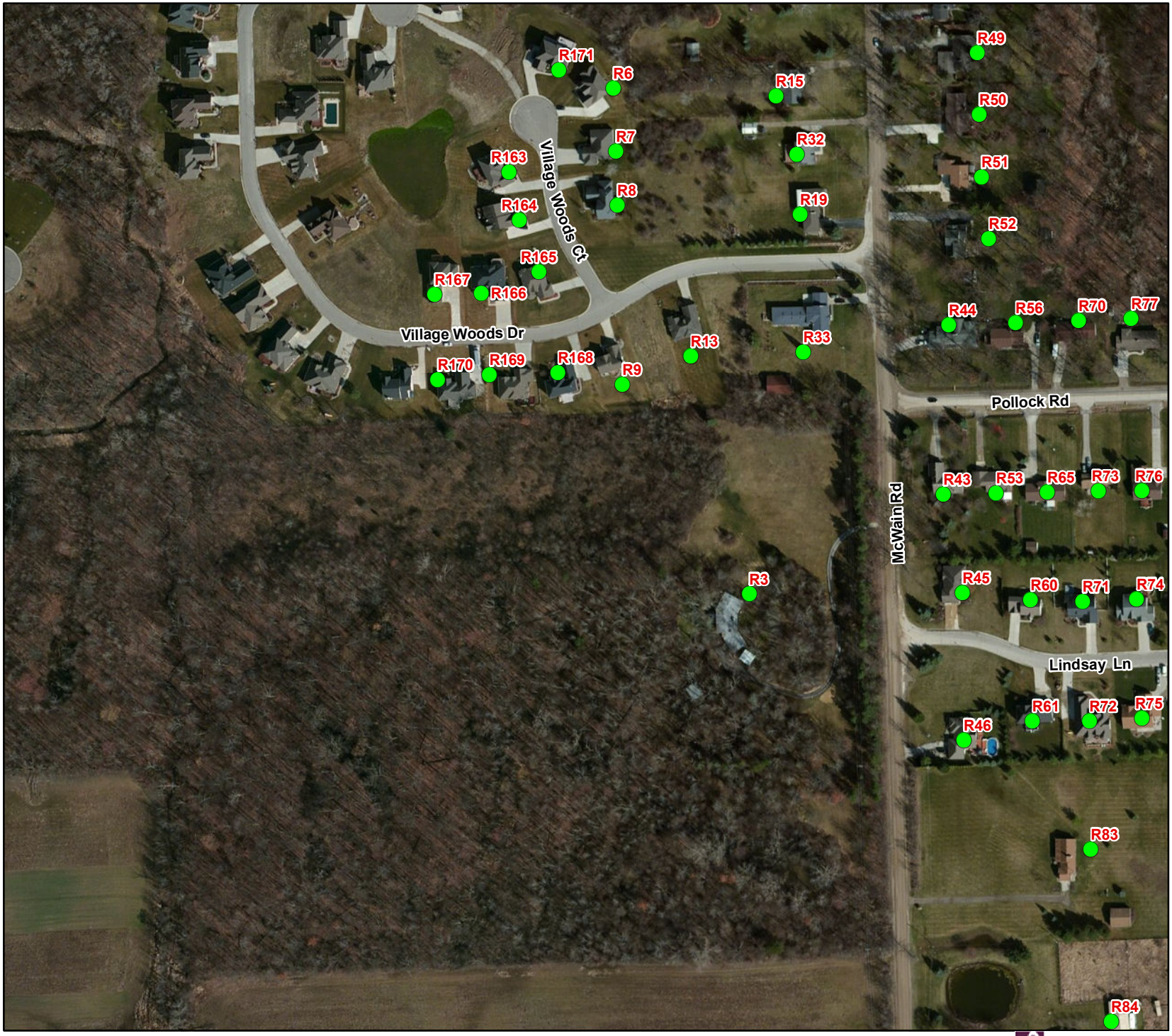
CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim
ROWE Professional Services Company

Figure C3



Dort Highway Extension

Genesee County, MI

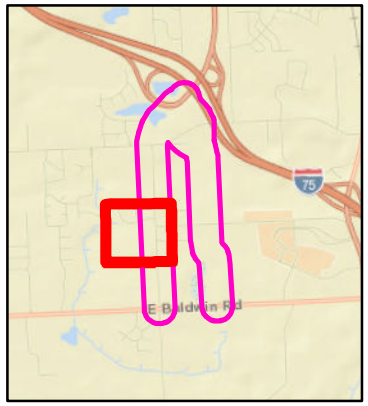
Option 1 Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 1
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



0 125 250 500 750 1,000 Feet

1 inch = 250 feet

CDM Smith

WadeTrim

Rowe Professional Services Company

Figure C4

Dort Highway Extension

Genesee County, MI

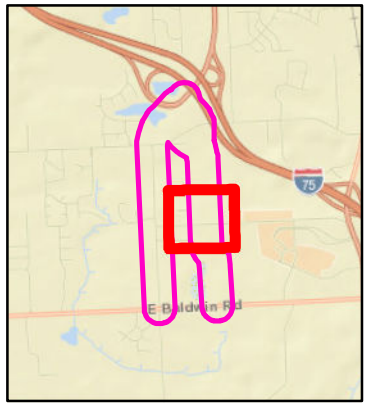
Option 1 Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 1
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim

Rowe Professional Services Company

Figure C5

Dort Highway Extension

Genesee County, MI

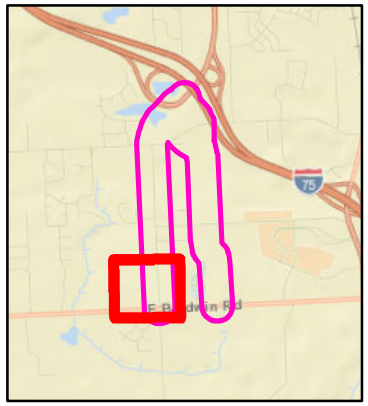
Option 1
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 1
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



0 125 250 500 750 1,000 Feet

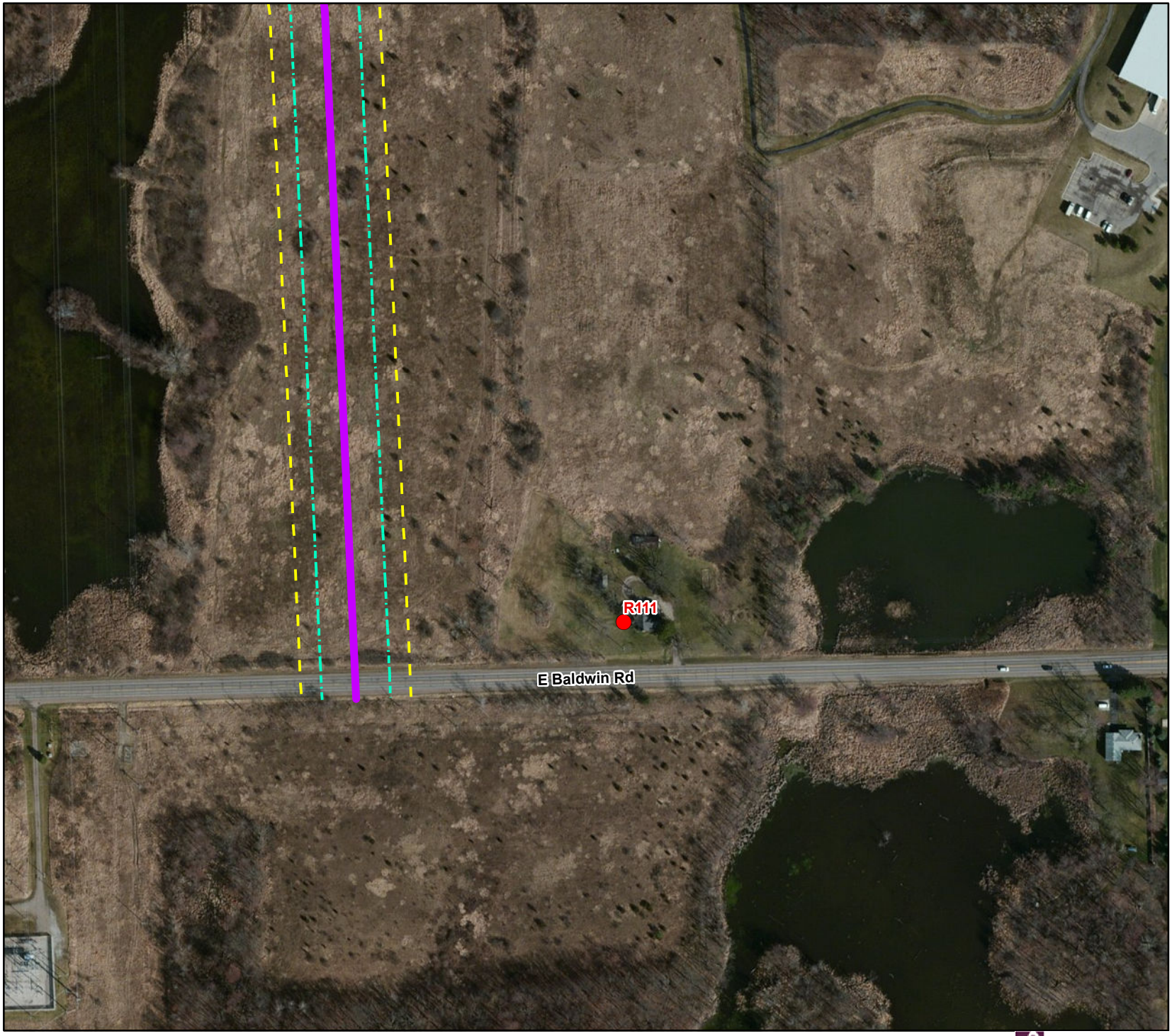
1 inch = 250 feet

CDM Smith

WadeTrim

Rowe Professional Services Company

Figure C6



Dort Highway Extension

Genesee County, MI

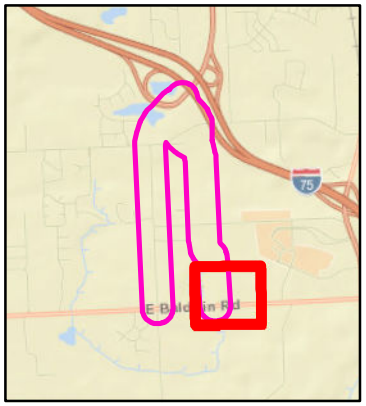
Option 1
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 1
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



0 125 250 500 750 1,000 Feet

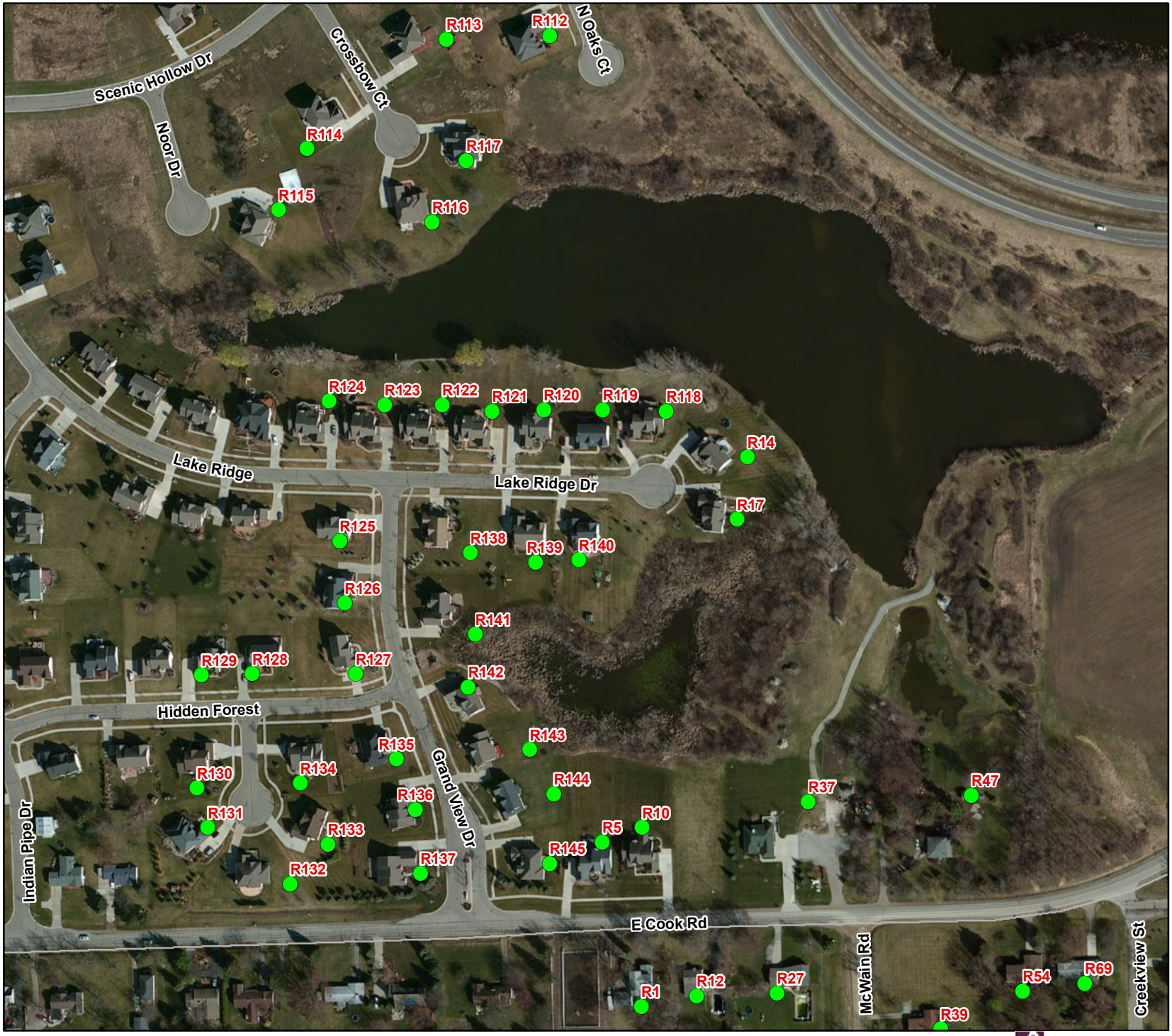
1 inch = 250 feet

CDM Smith

WadeTrim

Rowe Professional Services Company

Figure C7



Dort Highway Extension

Genesee County, MI

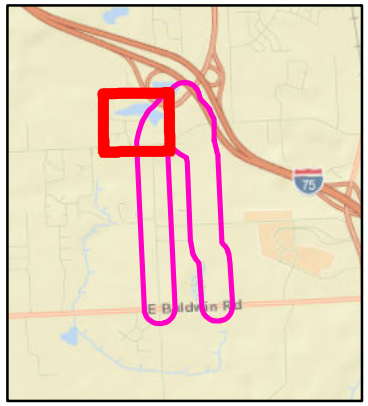
Option 2
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 2
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

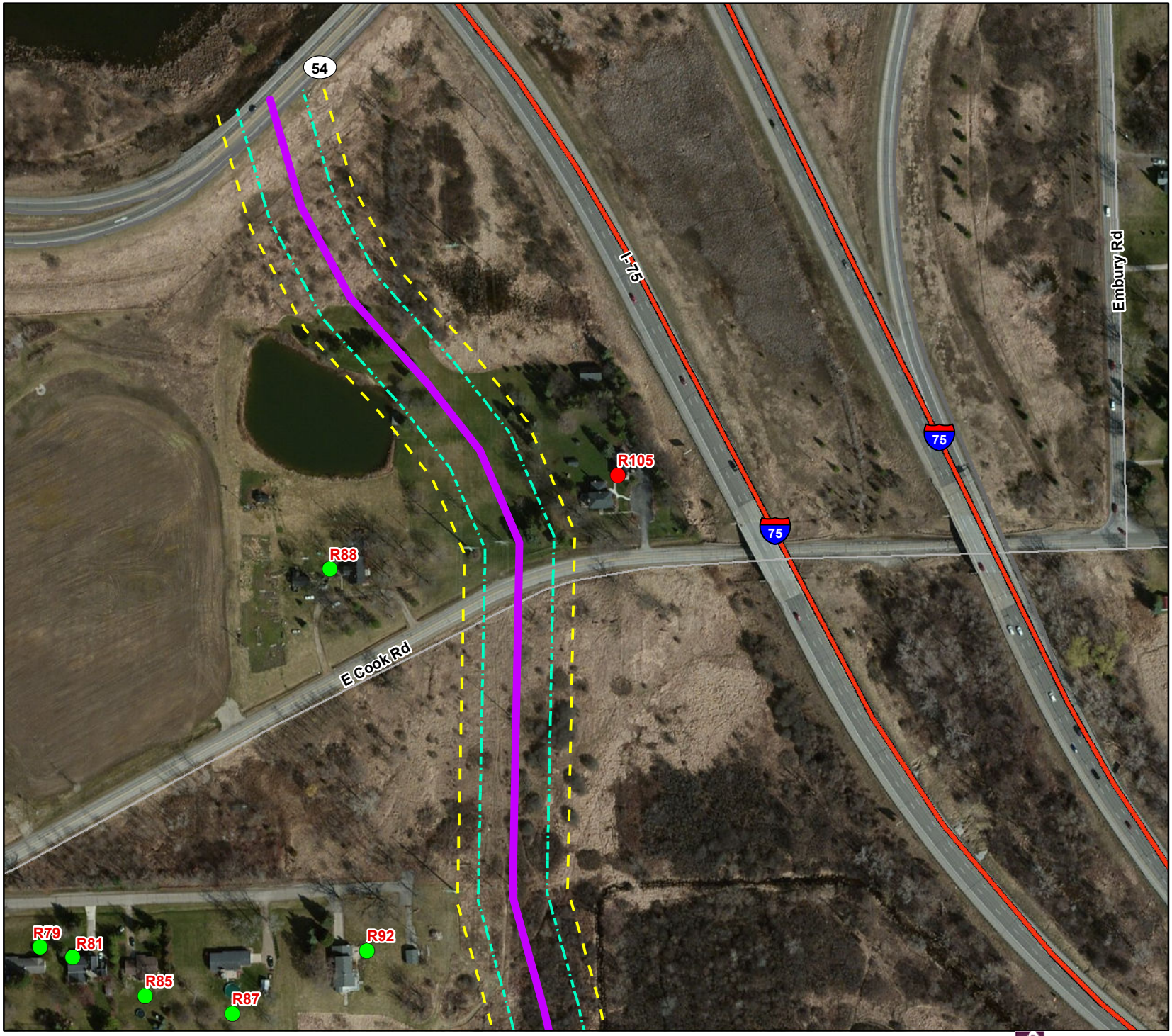
WadeTrim
Rowe Professional Services Company

Figure C8

Dort Highway Extension

Genesee County, MI

Option 2 Noise Results

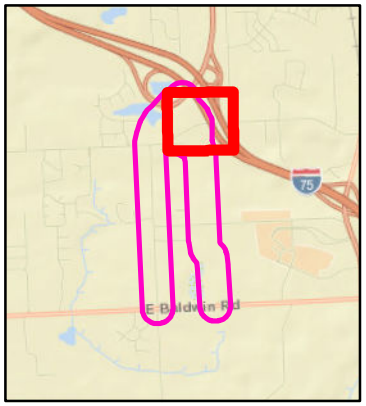


Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 2
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim

Rowe Professional Services Company

Figure C9

Dort Highway Extension

Genesee County, MI

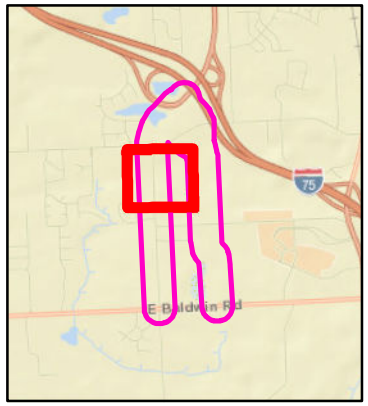
Option 2
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 2
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



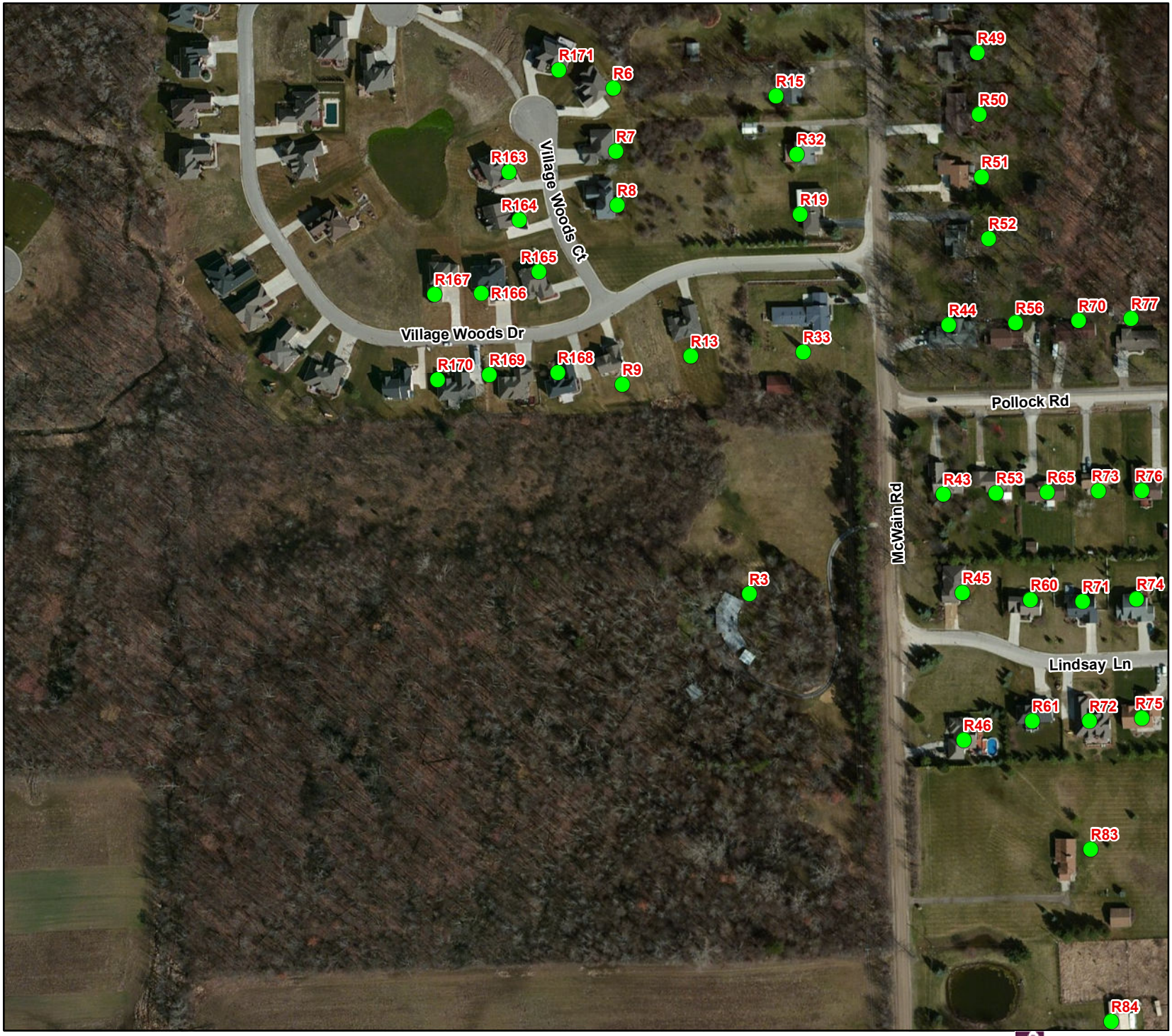
CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim
ROWE Professional Services Company

Figure C10



Dort Highway Extension

Genesee County, MI

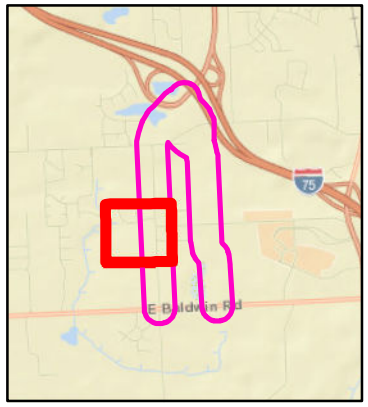
Option 2
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 2
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim

Rowe Professional Services Company

Figure C11

Dort Highway Extension

Genesee County, MI

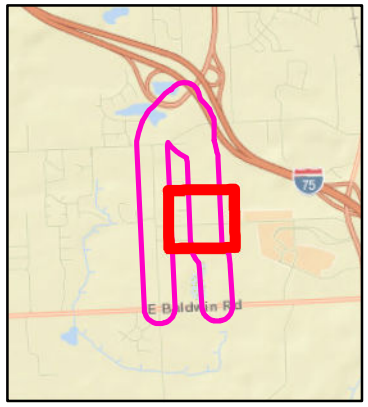
Option 2 Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 2
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim

Rowe Professional Services Company

Figure C12

Dort Highway Extension

Genesee County, MI

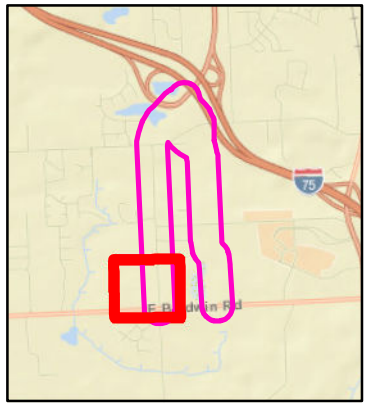
Option 2
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 2
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



0 125 250 500 750 1,000 Feet

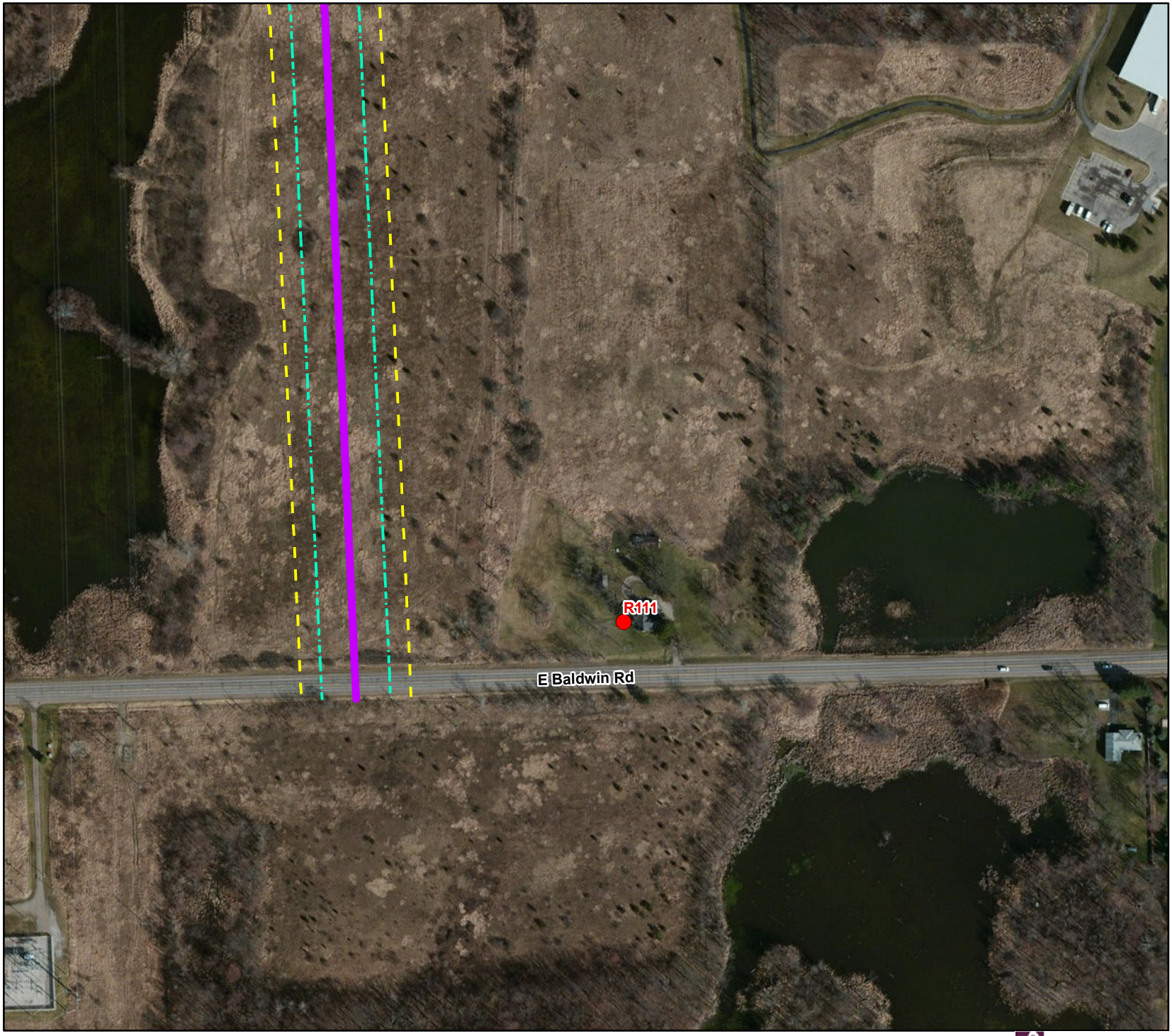
1 inch = 250 feet

CDM Smith

Wade Trim

Rowe Professional Services Company

Figure C13



Dort Highway Extension

Genesee County, MI

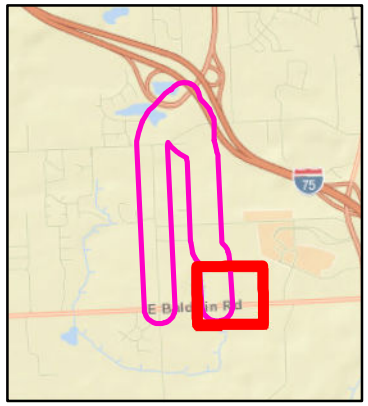
Option 2
Noise Results

Legend

- Impacted Receptor
- Non Impact
- Subject to Relocation

Alignment Alternative

- Option 2
- 66 dB(A) Leq Setback
- 71 dB(A) Leq Setback



0 125 250 500 750 1,000 Feet

1 inch = 250 feet

CDM Smith

WadeTrim

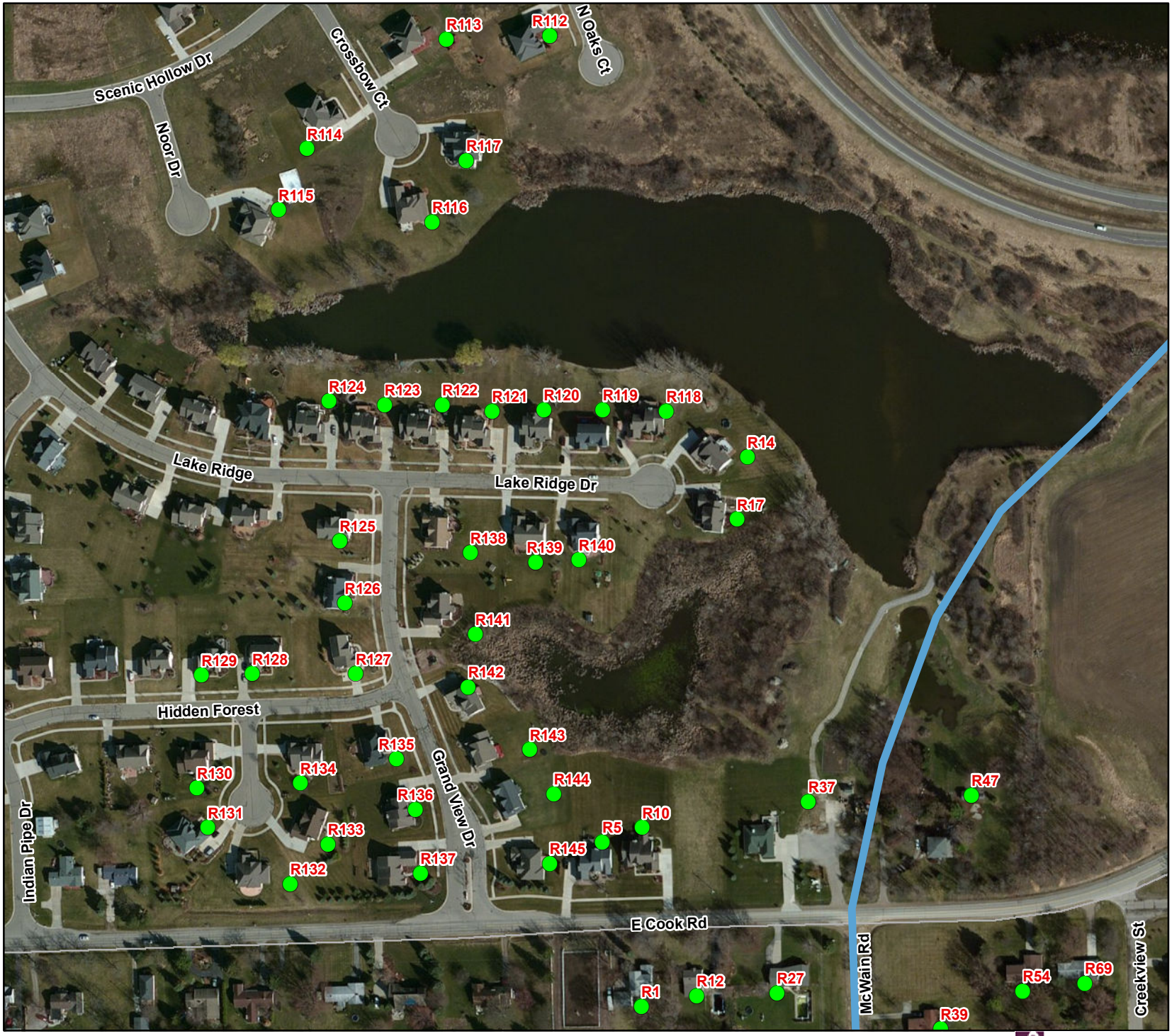
Rowe Professional Services Company

Figure C14

Dort Highway Extension

Genesee County, MI

Option 3
Noise Results

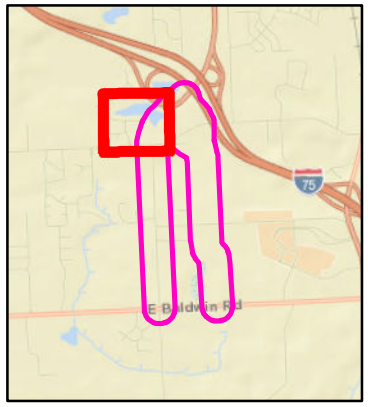


Legend

- Impacted Receptor
- Non Impact

Alignment Alternative

- McWain Road Option



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

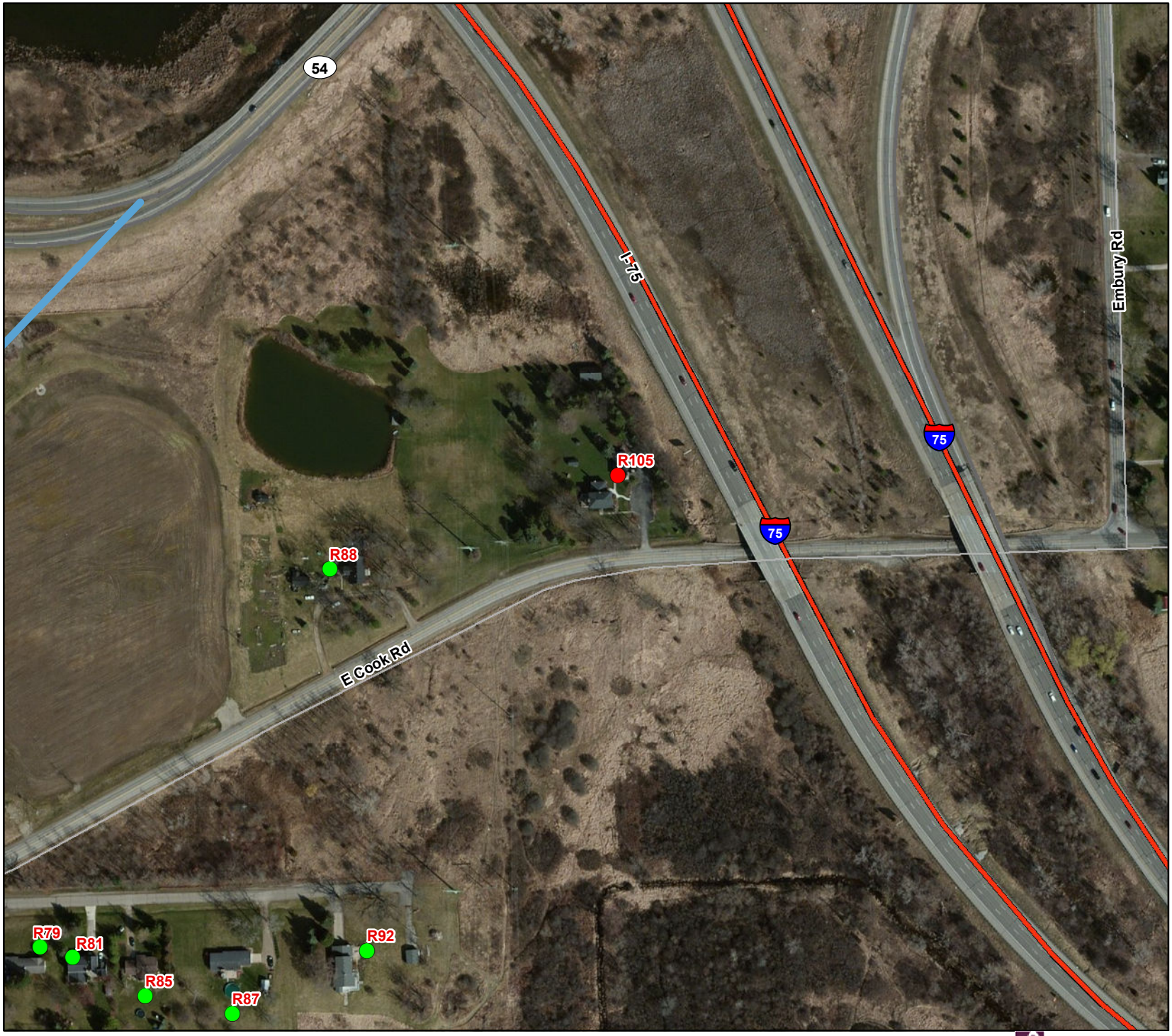
WadeTrim
Rowe Professional Services Company

Figure C15

Dort Highway Extension

Genesee County, MI

Option 3 Noise Results

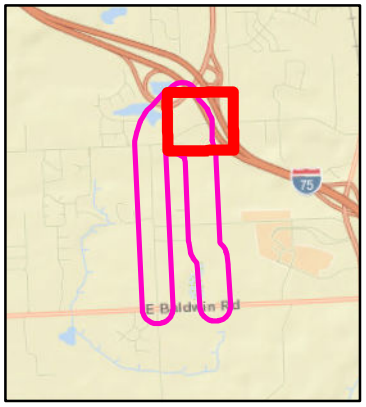


Legend

- Impacted Receptor
- Non Impact

Alignment Alternative

- McWain Road Option



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim

Rowe Professional Services Company

Figure C16

Dort Highway Extension

Genesee County, MI

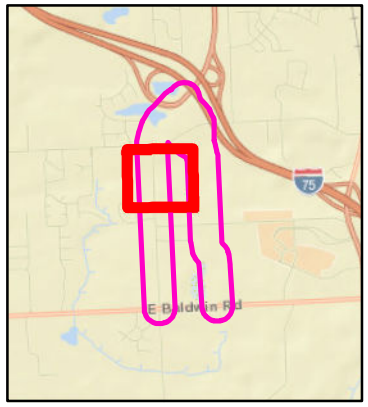
Option 3
Noise Results

Legend

- Impacted Receptor
- Non Impact

Alignment Alternative

- McWain Road Option



0 125 250 500 750 1,000 Feet

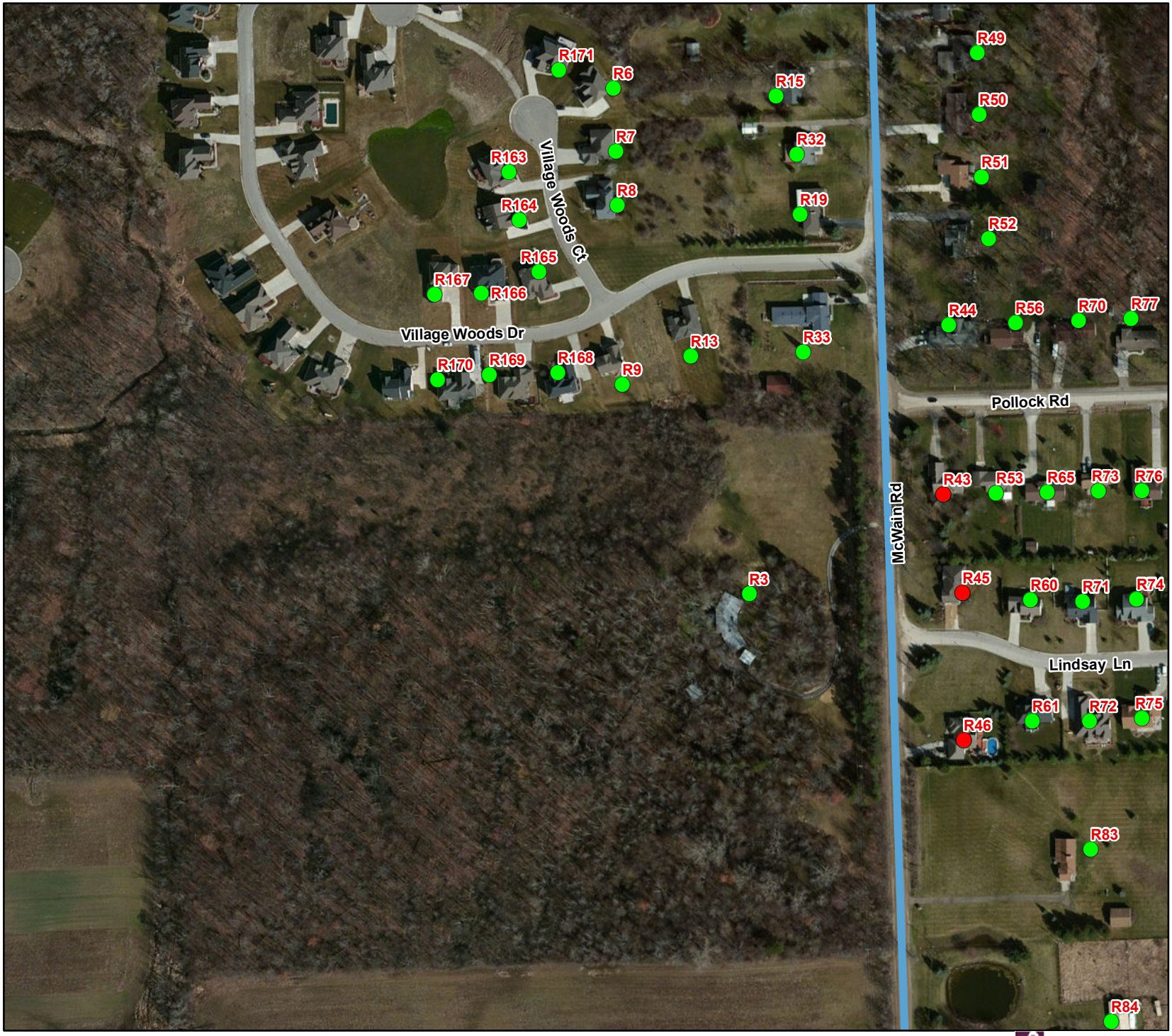
1 inch = 250 feet

CDM Smith

WadeTrim

Rowe Professional Services Company

Figure C17



Dort Highway Extension

Genesee County, MI

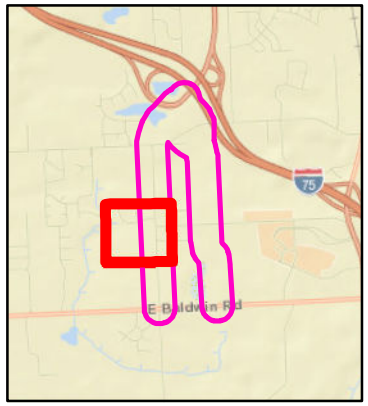
Option 3 Noise Results

Legend

- Impacted Receptor
- Non Impact

Alignment Alternative

- McWain Road Option



0 125 250 500 750 1,000 Feet

1 inch = 250 feet

CDM Smith

WadeTrim

Rowe Professional Services Company

Figure C18

Dort Highway Extension

Genesee County, MI

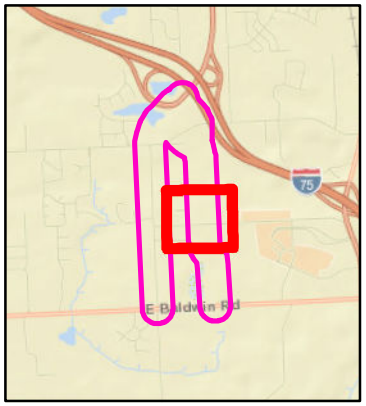
Option 3
Noise Results

Legend

- Impacted Receptor
- Non Impact

Alignment Alternative

- McWain Road Option



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim

Rowe Professional Services Company

Figure C19

Dort Highway Extension

Genesee County, MI

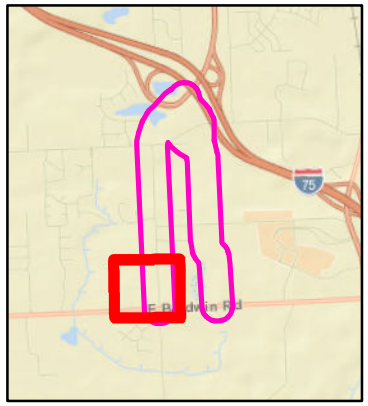
Option 3
Noise Results

Legend

- Impacted Receptor
- Non Impact

Alignment Alternative

- McWain Road Option



0 125 250 500 750 1,000 Feet

1 inch = 250 feet

CDM Smith

WadeTrim

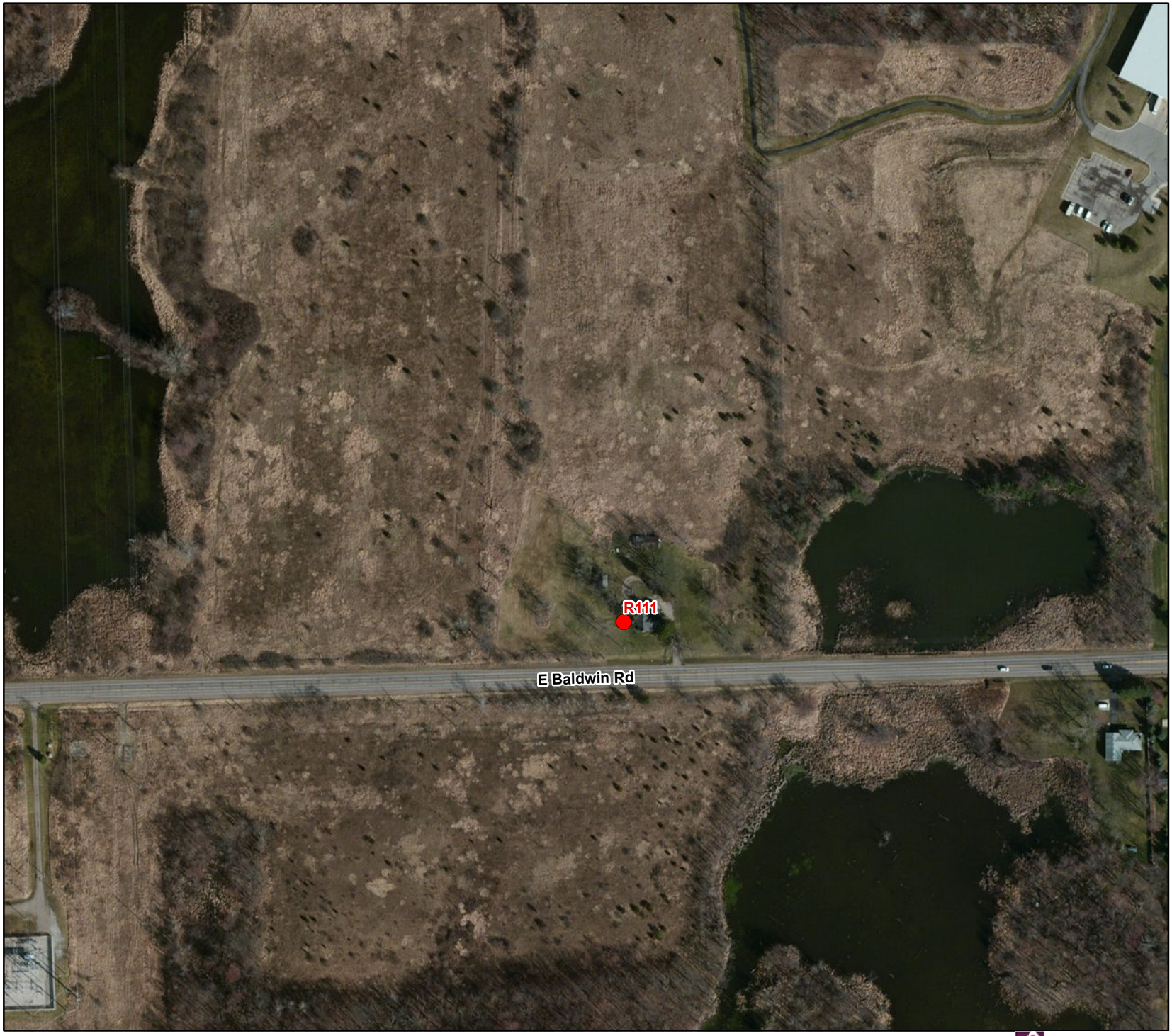
Rowe Professional Services Company

Figure C20

Dort Highway Extension

Genesee County, MI

Option 3
Noise Results

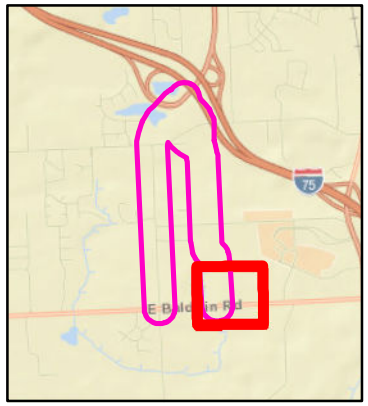


Legend

- Impacted Receptor
- Non Impact

Alignment Alternative

- McWain Road Option



CDM Smith

0 125 250 500 750 1,000 Feet

1 inch = 250 feet

WadeTrim

Rowe Professional Services Company

Figure C21

CDM Smith
AT
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Dort Highway
RUN: Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

22 August 2016
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	59.3	66	59.3	10	----	59.3	0.0	5	-5.0
Receiver2	2	1	0.0	52.0	66	52.0	10	----	52.0	0.0	5	-5.0
Receiver3	3	1	0.0	47.9	66	47.9	10	----	47.9	0.0	5	-5.0
Receiver4	4	1	0.0	47.1	66	47.1	10	----	47.1	0.0	5	-5.0
Receiver5	5	1	0.0	58.7	66	58.7	10	----	58.7	0.0	5	-5.0
Receiver6	6	1	0.0	47.0	66	47.0	10	----	47.0	0.0	5	-5.0
Receiver7	7	1	0.0	47.3	66	47.3	10	----	47.3	0.0	5	-5.0
Receiver8	8	1	0.0	46.8	66	46.8	10	----	46.8	0.0	5	-5.0
Receiver9	9	1	0.0	47.4	66	47.4	10	----	47.4	0.0	5	-5.0
Receiver10	10	1	0.0	57.4	66	57.4	10	----	57.4	0.0	5	-5.0
Receiver11	11	1	0.0	49.5	66	49.5	10	----	49.5	0.0	5	-5.0
Receiver12	12	1	0.0	60.5	66	60.5	10	----	60.5	0.0	5	-5.0
Receiver13	13	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver14	14	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver15	15	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver16	16	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver17	17	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver18	18	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver19	19	1	0.0	52.3	66	52.3	10	----	52.3	0.0	5	-5.0
Receiver20	20	1	0.0	53.7	66	53.7	10	----	53.7	0.0	5	-5.0
Receiver21	21	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver22	22	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver23	23	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver24	24	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver25	25	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0

Receiver26	26	1	0.0	56.2	66	56.2	10	----	56.2	0.0	5	-5.0
Receiver27	27	1	0.0	61.0	66	61.0	10	----	61.0	0.0	5	-5.0
Receiver28	28	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver29	29	1	0.0	54.4	66	54.4	10	----	54.4	0.0	5	-5.0
Receiver30	30	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver31	31	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver32	32	1	0.0	51.9	66	51.9	10	----	51.9	0.0	5	-5.0
Receiver33	33	1	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Receiver34	34	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver35	35	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver36	36	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver37	37	1	0.0	56.2	66	56.2	10	----	56.2	0.0	5	-5.0
Receiver38	38	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver39	39	1	0.0	58.2	66	58.2	10	----	58.2	0.0	5	-5.0
Receiver40	40	1	0.0	56.1	66	56.1	10	----	56.1	0.0	5	-5.0
Receiver41	41	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver42	42	1	0.0	55.4	66	55.4	10	----	55.4	0.0	5	-5.0
Receiver43	43	1	0.0	57.2	66	57.2	10	----	57.2	0.0	5	-5.0
Receiver44	44	1	0.0	56.3	66	56.3	10	----	56.3	0.0	5	-5.0
Receiver45	45	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver46	46	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver47	47	1	0.0	56.6	66	56.6	10	----	56.6	0.0	5	-5.0
Receiver48	48	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver49	49	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver50	50	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver51	51	1	0.0	51.6	66	51.6	10	----	51.6	0.0	5	-5.0
Receiver52	52	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver53	53	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver54	54	1	0.0	60.1	66	60.1	10	----	60.1	0.0	5	-5.0
Receiver55	55	1	0.0	53.7	66	53.7	10	----	53.7	0.0	5	-5.0
Receiver56	56	1	0.0	52.0	66	52.0	10	----	52.0	0.0	5	-5.0
Receiver57	57	1	0.0	55.7	66	55.7	10	----	55.7	0.0	5	-5.0
Receiver58	58	1	0.0	63.5	66	63.5	10	----	63.5	0.0	5	-5.0
Receiver59	59	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver60	60	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver61	61	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver62	62	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver63	63	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver64	64	1	0.0	54.7	66	54.7	10	----	54.7	0.0	5	-5.0
Receiver65	65	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver66	66	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver67	67	1	0.0	51.6	66	51.6	10	----	51.6	0.0	5	-5.0

Receiver68	68	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver69	69	1	0.0	59.8	66	59.8	10	----	59.8	0.0	5	-5.0
Receiver70	70	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver71	71	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver72	72	1	0.0	48.6	66	48.6	10	----	48.6	0.0	5	-5.0
Receiver73	73	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver74	74	1	0.0	48.8	66	48.8	10	----	48.8	0.0	5	-5.0
Receiver75	75	1	0.0	48.3	66	48.3	10	----	48.3	0.0	5	-5.0
Receiver76	76	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver77	77	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver78	78	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver79	79	1	0.0	59.6	66	59.6	10	----	59.6	0.0	5	-5.0
Receiver80	80	1	0.0	52.0	66	52.0	10	----	52.0	0.0	5	-5.0
Receiver81	81	1	0.0	57.7	66	57.7	10	----	57.7	0.0	5	-5.0
Receiver82	82	1	0.0	52.8	66	52.8	10	----	52.8	0.0	5	-5.0
Receiver83	83	1	0.0	48.1	66	48.1	10	----	48.1	0.0	5	-5.0
Receiver84	84	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver85	85	1	0.0	54.8	66	54.8	10	----	54.8	0.0	5	-5.0
Receiver86	86	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver87	87	1	0.0	54.5	66	54.5	10	----	54.5	0.0	5	-5.0
Receiver88	88	1	0.0	61.3	66	61.3	10	----	61.3	0.0	5	-5.0
Receiver89	89	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver90	90	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver91	91	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver92	92	1	0.0	56.9	66	56.9	10	----	56.9	0.0	5	-5.0
Receiver93	93	1	0.0	46.4	66	46.4	10	----	46.4	0.0	5	-5.0
Receiver94	94	1	0.0	47.8	66	47.8	10	----	47.8	0.0	5	-5.0
Receiver95	95	1	0.0	47.6	66	47.6	10	----	47.6	0.0	5	-5.0
Receiver96	96	1	0.0	48.4	66	48.4	10	----	48.4	0.0	5	-5.0
Receiver97	97	1	0.0	47.5	66	47.5	10	----	47.5	0.0	5	-5.0
Receiver98	98	1	0.0	46.9	66	46.9	10	----	46.9	0.0	5	-5.0
Receiver99	99	1	0.0	46.8	66	46.8	10	----	46.8	0.0	5	-5.0
Receiver100	100	1	0.0	46.9	66	46.9	10	----	46.9	0.0	5	-5.0
Receiver101	101	1	0.0	47.6	66	47.6	10	----	47.6	0.0	5	-5.0
Receiver102	102	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver103	103	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver104	104	1	0.0	45.5	66	45.5	10	----	45.5	0.0	5	-5.0
Receiver105	105	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	5	-5.0
Receiver106	106	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver107	107	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver108	108	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver109	109	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0

Receiver110	110	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver111	111	1	0.0	65.3	66	65.3	10	----	65.3	0.0	5	-5.0
Receiver119	119	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver120	120	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver121	121	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver122	122	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver123	123	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver124	124	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver125	125	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver126	126	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver127	127	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver128	128	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver129	129	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver130	130	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver131	131	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver132	132	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver133	133	1	0.0	48.7	66	48.7	10	----	48.7	0.0	5	-5.0
Receiver134	134	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver135	135	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver136	136	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver137	137	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver138	138	1	0.0	54.5	66	54.5	10	----	54.5	0.0	5	-5.0
Receiver139	139	1	0.0	62.4	66	62.4	10	----	62.4	0.0	5	-5.0
Receiver140	140	1	0.0	57.9	66	57.9	10	----	57.9	0.0	5	-5.0
Receiver141	141	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver142	142	1	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Receiver143	143	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver144	144	1	0.0	62.1	66	62.1	10	----	62.1	0.0	5	-5.0
Receiver145	145	1	0.0	48.8	66	48.8	10	----	48.8	0.0	5	-5.0
Receiver146	146	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver147	147	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver148	148	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver149	149	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver150	150	1	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Receiver151	151	1	0.0	54.6	66	54.6	10	----	54.6	0.0	5	-5.0
Receiver152	152	1	0.0	61.6	66	61.6	10	----	61.6	0.0	5	-5.0
Receiver153	153	1	0.0	52.1	66	52.1	10	----	52.1	0.0	5	-5.0
Receiver154	154	1	0.0	48.1	66	48.1	10	----	48.1	0.0	5	-5.0
Receiver155	155	1	0.0	47.3	66	47.3	10	----	47.3	0.0	5	-5.0
Receiver156	156	1	0.0	47.3	66	47.3	10	----	47.3	0.0	5	-5.0
Receiver157	157	1	0.0	48.6	66	48.6	10	----	48.6	0.0	5	-5.0
Receiver158	158	1	0.0	48.1	66	48.1	10	----	48.1	0.0	5	-5.0

Receiver159	159	1	0.0	47.6	66	47.6	10	----	47.6	0.0	5	-5.0
Receiver160	160	1	0.0	47.5	66	47.5	10	----	47.5	0.0	5	-5.0
Receiver161	161	1	0.0	47.8	66	47.8	10	----	47.8	0.0	5	-5.0
Receiver162	162	1	0.0	46.8	66	46.8	10	----	46.8	0.0	5	-5.0
Receiver163	163	1	0.0	46.6	66	46.6	10	----	46.6	0.0	5	-5.0
Receiver164	164	1	0.0	46.8	66	46.8	10	----	46.8	0.0	5	-5.0
Receiver165	165	1	0.0	47.1	66	47.1	10	----	47.1	0.0	5	-5.0
Receiver166	166	1	0.0	46.9	66	46.9	10	----	46.9	0.0	5	-5.0
Receiver167	167	1	0.0	52.8	66	52.8	10	----	52.8	0.0	5	-5.0
Receiver168	168	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver169	169	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver170	170	1	0.0	45.9	66	45.9	10	----	45.9	0.0	5	-5.0
Receiver171	171	1	0.0	47.0	66	47.0	10	----	47.0	0.0	5	-5.0
Receiver172	172	1	0.0	45.6	66	45.6	10	----	45.6	0.0	5	-5.0
Receiver173	173	1	0.0	46.4	66	46.4	10	----	46.4	0.0	5	-5.0
Receiver174	174	1	0.0	45.9	66	45.9	10	----	45.9	0.0	5	-5.0
Receiver175	175	1	0.0	46.5	66	46.5	10	----	46.5	0.0	5	-5.0
Receiver176	176	1	0.0	46.8	66	46.8	10	----	46.8	0.0	5	-5.0
Receiver177	177	1	0.0	46.4	66	46.4	10	----	46.4	0.0	5	-5.0
Receiver178	178	1	0.0	46.4	66	46.4	10	----	46.4	0.0	5	-5.0
Receiver179	179	1	0.0	45.5	66	45.5	10	----	45.5	0.0	5	-5.0
Receiver180	180	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver181	181	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver182	182	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver183	183	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver184	184	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver185	185	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver187	187	1	0.0	48.2	66	48.2	10	----	48.2	0.0	5	-5.0
Receiver188	188	1	0.0	48.7	66	48.7	10	----	48.7	0.0	5	-5.0
Receiver189	189	1	0.0	49.5	66	49.5	10	----	49.5	0.0	5	-5.0
Receiver190	190	1	0.0	48.8	66	48.8	10	----	48.8	0.0	5	-5.0
Receiver191	191	1	0.0	48.2	66	48.2	10	----	48.2	0.0	5	-5.0
Receiver192	192	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	184	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CDM Smith
AT
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Dort Highway
RUN: Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

22 August 2016
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	59.9	66	59.9	10	----	59.9	0.0	5	-5.0
Receiver2	2	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver3	3	1	0.0	48.8	66	48.8	10	----	48.8	0.0	5	-5.0
Receiver4	4	1	0.0	47.8	66	47.8	10	----	47.8	0.0	5	-5.0
Receiver5	5	1	0.0	59.2	66	59.2	10	----	59.2	0.0	5	-5.0
Receiver6	6	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver7	7	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver8	8	1	0.0	47.6	66	47.6	10	----	47.6	0.0	5	-5.0
Receiver9	9	1	0.0	48.3	66	48.3	10	----	48.3	0.0	5	-5.0
Receiver10	10	1	0.0	58.0	66	58.0	10	----	58.0	0.0	5	-5.0
Receiver11	11	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver12	12	1	0.0	61.1	66	61.1	10	----	61.1	0.0	5	-5.0
Receiver13	13	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver14	14	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver15	15	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver16	16	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver17	17	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver18	18	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver19	19	1	0.0	53.2	66	53.2	10	----	53.2	0.0	5	-5.0
Receiver20	20	1	0.0	54.4	66	54.4	10	----	54.4	0.0	5	-5.0
Receiver21	21	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver22	22	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver23	23	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver24	24	1	0.0	56.4	66	56.4	10	----	56.4	0.0	5	-5.0
Receiver25	25	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0

Receiver26	26	1	0.0	58.3	66	58.3	10	----	58.3	0.0	5	-5.0
Receiver27	27	1	0.0	61.6	66	61.6	10	----	61.6	0.0	5	-5.0
Receiver28	28	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver29	29	1	0.0	55.0	66	55.0	10	----	55.0	0.0	5	-5.0
Receiver30	30	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver31	31	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver32	32	1	0.0	52.8	66	52.8	10	----	52.8	0.0	5	-5.0
Receiver33	33	1	0.0	53.5	66	53.5	10	----	53.5	0.0	5	-5.0
Receiver34	34	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver35	35	1	0.0	51.6	66	51.6	10	----	51.6	0.0	5	-5.0
Receiver36	36	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver37	37	1	0.0	56.8	66	56.8	10	----	56.8	0.0	5	-5.0
Receiver38	38	1	0.0	55.7	66	55.7	10	----	55.7	0.0	5	-5.0
Receiver39	39	1	0.0	58.8	66	58.8	10	----	58.8	0.0	5	-5.0
Receiver40	40	1	0.0	56.8	66	56.8	10	----	56.8	0.0	5	-5.0
Receiver41	41	1	0.0	55.9	66	55.9	10	----	55.9	0.0	5	-5.0
Receiver42	42	1	0.0	56.1	66	56.1	10	----	56.1	0.0	5	-5.0
Receiver43	43	1	0.0	58.2	66	58.2	10	----	58.2	0.0	5	-5.0
Receiver44	44	1	0.0	57.5	66	57.5	10	----	57.5	0.0	5	-5.0
Receiver45	45	1	0.0	56.1	66	56.1	10	----	56.1	0.0	5	-5.0
Receiver46	46	1	0.0	56.0	66	56.0	10	----	56.0	0.0	5	-5.0
Receiver47	47	1	0.0	57.1	66	57.1	10	----	57.1	0.0	5	-5.0
Receiver48	48	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver49	49	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver50	50	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver51	51	1	0.0	52.5	66	52.5	10	----	52.5	0.0	5	-5.0
Receiver52	52	1	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Receiver53	53	1	0.0	54.3	66	54.3	10	----	54.3	0.0	5	-5.0
Receiver54	54	1	0.0	60.7	66	60.7	10	----	60.7	0.0	5	-5.0
Receiver55	55	1	0.0	55.1	66	55.1	10	----	55.1	0.0	5	-5.0
Receiver56	56	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver57	57	1	0.0	57.4	66	57.4	10	----	57.4	0.0	5	-5.0
Receiver58	58	1	0.0	65.6	66	65.6	10	----	65.6	0.0	5	-5.0
Receiver59	59	1	0.0	53.2	66	53.2	10	----	53.2	0.0	5	-5.0
Receiver60	60	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver61	61	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver62	62	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver63	63	1	0.0	52.3	66	52.3	10	----	52.3	0.0	5	-5.0
Receiver64	64	1	0.0	55.3	66	55.3	10	----	55.3	0.0	5	-5.0
Receiver65	65	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver66	66	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver67	67	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0

Receiver68	68	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver69	69	1	0.0	60.4	66	60.4	10	----	60.4	0.0	5	-5.0
Receiver70	70	1	0.0	53.2	66	53.2	10	----	53.2	0.0	5	-5.0
Receiver71	71	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver72	72	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver73	73	1	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Receiver74	74	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver75	75	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver76	76	1	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Receiver77	77	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver78	78	1	0.0	57.9	66	57.9	10	----	57.9	0.0	5	-5.0
Receiver79	79	1	0.0	60.2	66	60.2	10	----	60.2	0.0	5	-5.0
Receiver80	80	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver81	81	1	0.0	58.2	66	58.2	10	----	58.2	0.0	5	-5.0
Receiver82	82	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver83	83	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver84	84	1	0.0	48.6	66	48.6	10	----	48.6	0.0	5	-5.0
Receiver85	85	1	0.0	55.3	66	55.3	10	----	55.3	0.0	5	-5.0
Receiver86	86	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver87	87	1	0.0	55.0	66	55.0	10	----	55.0	0.0	5	-5.0
Receiver88	88	1	0.0	61.8	66	61.8	10	----	61.8	0.0	5	-5.0
Receiver89	89	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver90	90	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver91	91	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver92	92	1	0.0	57.5	66	57.5	10	----	57.5	0.0	5	-5.0
Receiver93	93	1	0.0	47.4	66	47.4	10	----	47.4	0.0	5	-5.0
Receiver94	94	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver95	95	1	0.0	48.3	66	48.3	10	----	48.3	0.0	5	-5.0
Receiver96	96	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver97	97	1	0.0	48.4	66	48.4	10	----	48.4	0.0	5	-5.0
Receiver98	98	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver99	99	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver100	100	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver101	101	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver102	102	1	0.0	55.5	66	55.5	10	----	55.5	0.0	5	-5.0
Receiver103	103	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver104	104	1	0.0	46.5	66	46.5	10	----	46.5	0.0	5	-5.0
Receiver105	105	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	5	-5.0
Receiver106	106	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver107	107	1	0.0	53.5	66	53.5	10	----	53.5	0.0	5	-5.0
Receiver108	108	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver109	109	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0

Receiver110	110	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver111	111	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	5	-5.0
Receiver119	119	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver120	120	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver121	121	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver122	122	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver123	123	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver124	124	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver125	125	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver126	126	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver127	127	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver128	128	1	0.0	49.5	66	49.5	10	----	49.5	0.0	5	-5.0
Receiver129	129	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver130	130	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver131	131	1	0.0	49.5	66	49.5	10	----	49.5	0.0	5	-5.0
Receiver132	132	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver133	133	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver134	134	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver135	135	1	0.0	49.5	66	49.5	10	----	49.5	0.0	5	-5.0
Receiver136	136	1	0.0	49.1	66	49.1	10	----	49.1	0.0	5	-5.0
Receiver137	137	1	0.0	52.1	66	52.1	10	----	52.1	0.0	5	-5.0
Receiver138	138	1	0.0	55.0	66	55.0	10	----	55.0	0.0	5	-5.0
Receiver139	139	1	0.0	62.9	66	62.9	10	----	62.9	0.0	5	-5.0
Receiver140	140	1	0.0	58.5	66	58.5	10	----	58.5	0.0	5	-5.0
Receiver141	141	1	0.0	53.2	66	53.2	10	----	53.2	0.0	5	-5.0
Receiver142	142	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver143	143	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver144	144	1	0.0	62.6	66	62.6	10	----	62.6	0.0	5	-5.0
Receiver145	145	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver146	146	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver147	147	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver148	148	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver149	149	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver150	150	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver151	151	1	0.0	55.1	66	55.1	10	----	55.1	0.0	5	-5.0
Receiver152	152	1	0.0	62.1	66	62.1	10	----	62.1	0.0	5	-5.0
Receiver153	153	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver154	154	1	0.0	48.7	66	48.7	10	----	48.7	0.0	5	-5.0
Receiver155	155	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver156	156	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver157	157	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver158	158	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0

Receiver159	159	1	0.0	48.4	66	48.4	10	----	48.4	0.0	5	-5.0
Receiver160	160	1	0.0	48.3	66	48.3	10	----	48.3	0.0	5	-5.0
Receiver161	161	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver162	162	1	0.0	47.9	66	47.9	10	----	47.9	0.0	5	-5.0
Receiver163	163	1	0.0	47.8	66	47.8	10	----	47.8	0.0	5	-5.0
Receiver164	164	1	0.0	48.0	66	48.0	10	----	48.0	0.0	5	-5.0
Receiver165	165	1	0.0	48.2	66	48.2	10	----	48.2	0.0	5	-5.0
Receiver166	166	1	0.0	48.1	66	48.1	10	----	48.1	0.0	5	-5.0
Receiver167	167	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver168	168	1	0.0	51.9	66	51.9	10	----	51.9	0.0	5	-5.0
Receiver169	169	1	0.0	52.3	66	52.3	10	----	52.3	0.0	5	-5.0
Receiver170	170	1	0.0	46.6	66	46.6	10	----	46.6	0.0	5	-5.0
Receiver171	171	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver172	172	1	0.0	46.3	66	46.3	10	----	46.3	0.0	5	-5.0
Receiver173	173	1	0.0	47.2	66	47.2	10	----	47.2	0.0	5	-5.0
Receiver174	174	1	0.0	46.7	66	46.7	10	----	46.7	0.0	5	-5.0
Receiver175	175	1	0.0	47.3	66	47.3	10	----	47.3	0.0	5	-5.0
Receiver176	176	1	0.0	47.6	66	47.6	10	----	47.6	0.0	5	-5.0
Receiver177	177	1	0.0	47.2	66	47.2	10	----	47.2	0.0	5	-5.0
Receiver178	178	1	0.0	47.1	66	47.1	10	----	47.1	0.0	5	-5.0
Receiver179	179	1	0.0	46.1	66	46.1	10	----	46.1	0.0	5	-5.0
Receiver180	180	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver181	181	1	0.0	50.2	66	50.2	10	----	50.2	0.0	5	-5.0
Receiver182	182	1	0.0	50.5	66	50.5	10	----	50.5	0.0	5	-5.0
Receiver183	183	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver184	184	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver185	185	1	0.0	48.8	66	48.8	10	----	48.8	0.0	5	-5.0
Receiver187	187	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver188	188	1	0.0	49.5	66	49.5	10	----	49.5	0.0	5	-5.0
Receiver189	189	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver190	190	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver191	191	1	0.0	49.1	66	49.1	10	----	49.1	0.0	5	-5.0
Receiver192	192	1	0.0	55.5	66	55.5	10	----	55.5	0.0	5	-5.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	184	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CDM Smith
AT
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Dort Highway
RUN: Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

22 August 2016
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	59.9	66	59.9	10	----	59.9	0.0	5	-5.0
Receiver2	2	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver3	3	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver4	4	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver5	5	1	0.0	59.3	66	59.3	10	----	59.3	0.0	5	-5.0
Receiver6	6	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver7	7	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver8	8	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver9	9	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver10	10	1	0.0	58.2	66	58.2	10	----	58.2	0.0	5	-5.0
Receiver11	11	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver12	12	1	0.0	61.1	66	61.1	10	----	61.1	0.0	5	-5.0
Receiver13	13	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver14	14	1	0.0	51.9	66	51.9	10	----	51.9	0.0	5	-5.0
Receiver15	15	1	0.0	52.1	66	52.1	10	----	52.1	0.0	5	-5.0
Receiver16	16	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver17	17	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver18	18	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver19	19	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver20	20	1	0.0	54.8	66	54.8	10	----	54.8	0.0	5	-5.0
Receiver21	21	1	0.0	52.3	66	52.3	10	----	52.3	0.0	5	-5.0
Receiver22	22	1	0.0	52.1	66	52.1	10	----	52.1	0.0	5	-5.0
Receiver23	23	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver24	24	1	0.0	56.9	66	56.9	10	----	56.9	0.0	5	-5.0
Receiver25	25	1	0.0	52.3	66	52.3	10	----	52.3	0.0	5	-5.0

Receiver26	26	1	0.0	58.3	66	58.3	10	----	58.3	0.0	5	-5.0
Receiver27	27	1	0.0	61.6	66	61.6	10	----	61.6	0.0	5	-5.0
Receiver28	28	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver29	29	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver30	30	1	0.0	54.3	66	54.3	10	----	54.3	0.0	5	-5.0
Receiver31	31	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0
Receiver32	32	1	0.0	53.7	66	53.7	10	----	53.7	0.0	5	-5.0
Receiver33	33	1	0.0	53.7	66	53.7	10	----	53.7	0.0	5	-5.0
Receiver34	34	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver35	35	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver36	36	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver37	37	1	0.0	57.2	66	57.2	10	----	57.2	0.0	5	-5.0
Receiver38	38	1	0.0	55.9	66	55.9	10	----	55.9	0.0	5	-5.0
Receiver39	39	1	0.0	58.9	66	58.9	10	----	58.9	0.0	5	-5.0
Receiver40	40	1	0.0	56.9	66	56.9	10	----	56.9	0.0	5	-5.0
Receiver41	41	1	0.0	56.3	66	56.3	10	----	56.3	0.0	5	-5.0
Receiver42	42	1	0.0	56.5	66	56.5	10	----	56.5	0.0	5	-5.0
Receiver43	43	1	0.0	58.2	66	58.2	10	----	58.2	0.0	5	-5.0
Receiver44	44	1	0.0	57.6	66	57.6	10	----	57.6	0.0	5	-5.0
Receiver45	45	1	0.0	56.3	66	56.3	10	----	56.3	0.0	5	-5.0
Receiver46	46	1	0.0	56.2	66	56.2	10	----	56.2	0.0	5	-5.0
Receiver47	47	1	0.0	57.5	66	57.5	10	----	57.5	0.0	5	-5.0
Receiver48	48	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver49	49	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver50	50	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver51	51	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver52	52	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver53	53	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0
Receiver54	54	1	0.0	60.7	66	60.7	10	----	60.7	0.0	5	-5.0
Receiver55	55	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver56	56	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver57	57	1	0.0	57.5	66	57.5	10	----	57.5	0.0	5	-5.0
Receiver58	58	1	0.0	65.6	66	65.6	10	----	65.6	0.0	5	-5.0
Receiver59	59	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver60	60	1	0.0	51.6	66	51.6	10	----	51.6	0.0	5	-5.0
Receiver61	61	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver62	62	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver63	63	1	0.0	53.9	66	53.9	10	----	53.9	0.0	5	-5.0
Receiver64	64	1	0.0	55.7	66	55.7	10	----	55.7	0.0	5	-5.0
Receiver65	65	1	0.0	52.8	66	52.8	10	----	52.8	0.0	5	-5.0
Receiver66	66	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver67	67	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0

Receiver68	68	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver69	69	1	0.0	60.5	66	60.5	10	----	60.5	0.0	5	-5.0
Receiver70	70	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver71	71	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver72	72	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver73	73	1	0.0	52.5	66	52.5	10	----	52.5	0.0	5	-5.0
Receiver74	74	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver75	75	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver76	76	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver77	77	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver78	78	1	0.0	58.0	66	58.0	10	----	58.0	0.0	5	-5.0
Receiver79	79	1	0.0	60.6	66	60.6	10	----	60.6	0.0	5	-5.0
Receiver80	80	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver81	81	1	0.0	59.1	66	59.1	10	----	59.1	0.0	5	-5.0
Receiver82	82	1	0.0	55.4	66	55.4	10	----	55.4	0.0	5	-5.0
Receiver83	83	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver84	84	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver85	85	1	0.0	56.9	66	56.9	10	----	56.9	0.0	5	-5.0
Receiver86	86	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver87	87	1	0.0	58.1	66	58.1	10	----	58.1	0.0	5	-5.0
Receiver88	88	1	0.0	62.6	66	62.6	10	----	62.6	0.0	5	-5.0
Receiver89	89	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver90	90	1	0.0	55.7	66	55.7	10	----	55.7	0.0	5	-5.0
Receiver91	91	1	0.0	53.5	66	53.5	10	----	53.5	0.0	5	-5.0
Receiver92	92	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	5	-5.0
Receiver93	93	1	0.0	52.3	66	52.3	10	----	52.3	0.0	5	-5.0
Receiver94	94	1	0.0	54.4	66	54.4	10	----	54.4	0.0	5	-5.0
Receiver95	95	1	0.0	54.5	66	54.5	10	----	54.5	0.0	5	-5.0
Receiver96	96	1	0.0	54.4	66	54.4	10	----	54.4	0.0	5	-5.0
Receiver97	97	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver98	98	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver99	99	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver100	100	1	0.0	53.7	66	53.7	10	----	53.7	0.0	5	-5.0
Receiver101	101	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver102	102	1	0.0	57.4	66	57.4	10	----	57.4	0.0	5	-5.0
Receiver103	103	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver104	104	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver105	105	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	5	-5.0
Receiver106	106	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	5	0.0
Receiver107	107	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	5	0.0
Receiver108	108	1	0.0	59.8	66	59.8	10	----	59.8	0.0	5	-5.0
Receiver109	109	1	0.0	58.8	66	58.8	10	----	58.8	0.0	5	-5.0

Receiver110	110	1	0.0	58.3	66	58.3	10	----	58.3	0.0	5	-5.0
Receiver111	111	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	5	-5.0
Receiver119	119	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver120	120	1	0.0	52.1	66	52.1	10	----	52.1	0.0	5	-5.0
Receiver121	121	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver122	122	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver123	123	1	0.0	50.2	66	50.2	10	----	50.2	0.0	5	-5.0
Receiver124	124	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver125	125	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver126	126	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver127	127	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver128	128	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver129	129	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver130	130	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver131	131	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver132	132	1	0.0	49.1	66	49.1	10	----	49.1	0.0	5	-5.0
Receiver133	133	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver134	134	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver135	135	1	0.0	50.2	66	50.2	10	----	50.2	0.0	5	-5.0
Receiver136	136	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver137	137	1	0.0	52.3	66	52.3	10	----	52.3	0.0	5	-5.0
Receiver138	138	1	0.0	55.1	66	55.1	10	----	55.1	0.0	5	-5.0
Receiver139	139	1	0.0	63.0	66	63.0	10	----	63.0	0.0	5	-5.0
Receiver140	140	1	0.0	58.5	66	58.5	10	----	58.5	0.0	5	-5.0
Receiver141	141	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver142	142	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver143	143	1	0.0	56.0	66	56.0	10	----	56.0	0.0	5	-5.0
Receiver144	144	1	0.0	62.7	66	62.7	10	----	62.7	0.0	5	-5.0
Receiver145	145	1	0.0	50.2	66	50.2	10	----	50.2	0.0	5	-5.0
Receiver146	146	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver147	147	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver148	148	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver149	149	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver150	150	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver151	151	1	0.0	55.4	66	55.4	10	----	55.4	0.0	5	-5.0
Receiver152	152	1	0.0	62.2	66	62.2	10	----	62.2	0.0	5	-5.0
Receiver153	153	1	0.0	54.5	66	54.5	10	----	54.5	0.0	5	-5.0
Receiver154	154	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver155	155	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0
Receiver156	156	1	0.0	53.7	66	53.7	10	----	53.7	0.0	5	-5.0
Receiver157	157	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver158	158	1	0.0	52.0	66	52.0	10	----	52.0	0.0	5	-5.0

Receiver159	159	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver160	160	1	0.0	50.5	66	50.5	10	----	50.5	0.0	5	-5.0
Receiver161	161	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver162	162	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver163	163	1	0.0	50.2	66	50.2	10	----	50.2	0.0	5	-5.0
Receiver164	164	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver165	165	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver166	166	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver167	167	1	0.0	56.0	66	56.0	10	----	56.0	0.0	5	-5.0
Receiver168	168	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver169	169	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver170	170	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver171	171	1	0.0	48.2	66	48.2	10	----	48.2	0.0	5	-5.0
Receiver172	172	1	0.0	47.8	66	47.8	10	----	47.8	0.0	5	-5.0
Receiver173	173	1	0.0	48.2	66	48.2	10	----	48.2	0.0	5	-5.0
Receiver174	174	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver175	175	1	0.0	48.8	66	48.8	10	----	48.8	0.0	5	-5.0
Receiver176	176	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver177	177	1	0.0	48.3	66	48.3	10	----	48.3	0.0	5	-5.0
Receiver178	178	1	0.0	47.8	66	47.8	10	----	47.8	0.0	5	-5.0
Receiver179	179	1	0.0	48.2	66	48.2	10	----	48.2	0.0	5	-5.0
Receiver180	180	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver181	181	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver182	182	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver183	183	1	0.0	50.5	66	50.5	10	----	50.5	0.0	5	-5.0
Receiver184	184	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver185	185	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver187	187	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver188	188	1	0.0	50.5	66	50.5	10	----	50.5	0.0	5	-5.0
Receiver189	189	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver190	190	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver191	191	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver192	192	1	0.0	58.1	66	58.1	10	----	58.1	0.0	5	-5.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	184	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CDM Smith
AT
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Dort Highway
RUN: Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

22 August 2016
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	60.2	66	60.2	10	----	60.2	0.0	5	-5.0
Receiver2	2	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver3	3	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver4	4	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver5	5	1	0.0	59.3	66	59.3	10	----	59.3	0.0	5	-5.0
Receiver6	6	1	0.0	48.6	66	48.6	10	----	48.6	0.0	5	-5.0
Receiver7	7	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver8	8	1	0.0	47.4	66	47.4	10	----	47.4	0.0	5	-5.0
Receiver9	9	1	0.0	48.2	66	48.2	10	----	48.2	0.0	5	-5.0
Receiver10	10	1	0.0	58.1	66	58.1	10	----	58.1	0.0	5	-5.0
Receiver11	11	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver12	12	1	0.0	61.3	66	61.3	10	----	61.3	0.0	5	-5.0
Receiver13	13	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver14	14	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver15	15	1	0.0	52.1	66	52.1	10	----	52.1	0.0	5	-5.0
Receiver16	16	1	0.0	55.0	66	55.0	10	----	55.0	0.0	5	-5.0
Receiver17	17	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver18	18	1	0.0	53.5	66	53.5	10	----	53.5	0.0	5	-5.0
Receiver19	19	1	0.0	53.7	66	53.7	10	----	53.7	0.0	5	-5.0
Receiver20	20	1	0.0	54.5	66	54.5	10	----	54.5	0.0	5	-5.0
Receiver21	21	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver22	22	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver23	23	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver24	24	1	0.0	56.5	66	56.5	10	----	56.5	0.0	5	-5.0
Receiver25	25	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0

Receiver26	26	1	0.0	58.3	66	58.3	10	----	58.3	0.0	5	-5.0
Receiver27	27	1	0.0	61.8	66	61.8	10	----	61.8	0.0	5	-5.0
Receiver28	28	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver29	29	1	0.0	55.4	66	55.4	10	----	55.4	0.0	5	-5.0
Receiver30	30	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Receiver31	31	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver32	32	1	0.0	53.5	66	53.5	10	----	53.5	0.0	5	-5.0
Receiver33	33	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver34	34	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver35	35	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver36	36	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver37	37	1	0.0	57.1	66	57.1	10	----	57.1	0.0	5	-5.0
Receiver38	38	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver39	39	1	0.0	59.5	66	59.5	10	----	59.5	0.0	5	-5.0
Receiver40	40	1	0.0	57.6	66	57.6	10	----	57.6	0.0	5	-5.0
Receiver41	41	1	0.0	56.4	66	56.4	10	----	56.4	0.0	5	-5.0
Receiver42	42	1	0.0	56.2	66	56.2	10	----	56.2	0.0	5	-5.0
Receiver43	43	1	0.0	58.3	66	58.3	10	----	58.3	0.0	5	-5.0
Receiver44	44	1	0.0	57.7	66	57.7	10	----	57.7	0.0	5	-5.0
Receiver45	45	1	0.0	56.4	66	56.4	10	----	56.4	0.0	5	-5.0
Receiver46	46	1	0.0	56.3	66	56.3	10	----	56.3	0.0	5	-5.0
Receiver47	47	1	0.0	57.4	66	57.4	10	----	57.4	0.0	5	-5.0
Receiver48	48	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver49	49	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver50	50	1	0.0	53.2	66	53.2	10	----	53.2	0.0	5	-5.0
Receiver51	51	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver52	52	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver53	53	1	0.0	54.5	66	54.5	10	----	54.5	0.0	5	-5.0
Receiver54	54	1	0.0	60.9	66	60.9	10	----	60.9	0.0	5	-5.0
Receiver55	55	1	0.0	55.2	66	55.2	10	----	55.2	0.0	5	-5.0
Receiver56	56	1	0.0	54.3	66	54.3	10	----	54.3	0.0	5	-5.0
Receiver57	57	1	0.0	57.5	66	57.5	10	----	57.5	0.0	5	-5.0
Receiver58	58	1	0.0	65.6	66	65.6	10	----	65.6	0.0	5	-5.0
Receiver59	59	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver60	60	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver61	61	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver62	62	1	0.0	52.8	66	52.8	10	----	52.8	0.0	5	-5.0
Receiver63	63	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver64	64	1	0.0	56.4	66	56.4	10	----	56.4	0.0	5	-5.0
Receiver65	65	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver66	66	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver67	67	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0

Receiver68	68	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver69	69	1	0.0	61.0	66	61.0	10	----	61.0	0.0	5	-5.0
Receiver70	70	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver71	71	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver72	72	1	0.0	50.5	66	50.5	10	----	50.5	0.0	5	-5.0
Receiver73	73	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver74	74	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver75	75	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver76	76	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver77	77	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver78	78	1	0.0	57.9	66	57.9	10	----	57.9	0.0	5	-5.0
Receiver79	79	1	0.0	60.7	66	60.7	10	----	60.7	0.0	5	-5.0
Receiver80	80	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0
Receiver81	81	1	0.0	58.7	66	58.7	10	----	58.7	0.0	5	-5.0
Receiver82	82	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver83	83	1	0.0	49.8	66	49.8	10	----	49.8	0.0	5	-5.0
Receiver84	84	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver85	85	1	0.0	56.0	66	56.0	10	----	56.0	0.0	5	-5.0
Receiver86	86	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver87	87	1	0.0	55.7	66	55.7	10	----	55.7	0.0	5	-5.0
Receiver88	88	1	0.0	62.7	66	62.7	10	----	62.7	0.0	5	-5.0
Receiver89	89	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver90	90	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver91	91	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver92	92	1	0.0	57.5	66	57.5	10	----	57.5	0.0	5	-5.0
Receiver93	93	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver94	94	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver95	95	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Receiver96	96	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0
Receiver97	97	1	0.0	55.5	66	55.5	10	----	55.5	0.0	5	-5.0
Receiver98	98	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver99	99	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver100	100	1	0.0	53.5	66	53.5	10	----	53.5	0.0	5	-5.0
Receiver101	101	1	0.0	53.9	66	53.9	10	----	53.9	0.0	5	-5.0
Receiver102	102	1	0.0	57.4	66	57.4	10	----	57.4	0.0	5	-5.0
Receiver103	103	1	0.0	54.4	66	54.4	10	----	54.4	0.0	5	-5.0
Receiver104	104	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Receiver105	105	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	5	-5.0
Receiver106	106	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	5	0.0
Receiver107	107	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	5	0.0
Receiver108	108	1	0.0	59.8	66	59.8	10	----	59.8	0.0	5	-5.0
Receiver109	109	1	0.0	58.8	66	58.8	10	----	58.8	0.0	5	-5.0

Receiver110	110	1	0.0	58.2	66	58.2	10	----	58.2	0.0	5	-5.0
Receiver111	111	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	5	-5.0
Receiver119	119	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver120	120	1	0.0	51.9	66	51.9	10	----	51.9	0.0	5	-5.0
Receiver121	121	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver122	122	1	0.0	48.4	66	48.4	10	----	48.4	0.0	5	-5.0
Receiver123	123	1	0.0	48.4	66	48.4	10	----	48.4	0.0	5	-5.0
Receiver124	124	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver125	125	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver126	126	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver127	127	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver128	128	1	0.0	48.7	66	48.7	10	----	48.7	0.0	5	-5.0
Receiver129	129	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver130	130	1	0.0	49.5	66	49.5	10	----	49.5	0.0	5	-5.0
Receiver131	131	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver132	132	1	0.0	48.4	66	48.4	10	----	48.4	0.0	5	-5.0
Receiver133	133	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver134	134	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver135	135	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver136	136	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver137	137	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver138	138	1	0.0	55.1	66	55.1	10	----	55.1	0.0	5	-5.0
Receiver139	139	1	0.0	63.0	66	63.0	10	----	63.0	0.0	5	-5.0
Receiver140	140	1	0.0	58.5	66	58.5	10	----	58.5	0.0	5	-5.0
Receiver141	141	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver142	142	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver143	143	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver144	144	1	0.0	62.6	66	62.6	10	----	62.6	0.0	5	-5.0
Receiver145	145	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver146	146	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver147	147	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver148	148	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver149	149	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver150	150	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver151	151	1	0.0	55.3	66	55.3	10	----	55.3	0.0	5	-5.0
Receiver152	152	1	0.0	62.2	66	62.2	10	----	62.2	0.0	5	-5.0
Receiver153	153	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver154	154	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver155	155	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver156	156	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver157	157	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver158	158	1	0.0	51.9	66	51.9	10	----	51.9	0.0	5	-5.0

Receiver159	159	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver160	160	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver161	161	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver162	162	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver163	163	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver164	164	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver165	165	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver166	166	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver167	167	1	0.0	56.0	66	56.0	10	----	56.0	0.0	5	-5.0
Receiver168	168	1	0.0	53.1	66	53.1	10	----	53.1	0.0	5	-5.0
Receiver169	169	1	0.0	52.6	66	52.6	10	----	52.6	0.0	5	-5.0
Receiver170	170	1	0.0	46.5	66	46.5	10	----	46.5	0.0	5	-5.0
Receiver171	171	1	0.0	46.5	66	46.5	10	----	46.5	0.0	5	-5.0
Receiver172	172	1	0.0	46.2	66	46.2	10	----	46.2	0.0	5	-5.0
Receiver173	173	1	0.0	46.7	66	46.7	10	----	46.7	0.0	5	-5.0
Receiver174	174	1	0.0	46.1	66	46.1	10	----	46.1	0.0	5	-5.0
Receiver175	175	1	0.0	47.1	66	47.1	10	----	47.1	0.0	5	-5.0
Receiver176	176	1	0.0	46.8	66	46.8	10	----	46.8	0.0	5	-5.0
Receiver177	177	1	0.0	46.1	66	46.1	10	----	46.1	0.0	5	-5.0
Receiver178	178	1	0.0	47.7	66	47.7	10	----	47.7	0.0	5	-5.0
Receiver179	179	1	0.0	47.6	66	47.6	10	----	47.6	0.0	5	-5.0
Receiver180	180	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver181	181	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver182	182	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver183	183	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver184	184	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver185	185	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver187	187	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver188	188	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver189	189	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver190	190	1	0.0	50.7	66	50.7	10	----	50.7	0.0	5	-5.0
Receiver191	191	1	0.0	50.5	66	50.5	10	----	50.5	0.0	5	-5.0
Receiver192	192	1	0.0	58.1	66	58.1	10	----	58.1	0.0	5	-5.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	184	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CDM Smith
AT
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Dort Highway
RUN: Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

22 August 2016
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	60.5	66	60.5	10	----	60.5	0.0	5	-5.0
Receiver2	2	1	0.0	59.9	66	59.9	10	----	59.9	0.0	5	-5.0
Receiver3	3	1	0.0	55.4	66	55.4	10	----	55.4	0.0	5	-5.0
Receiver4	4	1	0.0	52.5	66	52.5	10	----	52.5	0.0	5	-5.0
Receiver5	5	1	0.0	59.7	66	59.7	10	----	59.7	0.0	5	-5.0
Receiver6	6	1	0.0	51.3	66	51.3	10	----	51.3	0.0	5	-5.0
Receiver7	7	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver8	8	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver9	9	1	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
Receiver10	10	1	0.0	58.8	66	58.8	10	----	58.8	0.0	5	-5.0
Receiver11	11	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver12	12	1	0.0	61.9	66	61.9	10	----	61.9	0.0	5	-5.0
Receiver13	13	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Receiver14	14	1	0.0	52.8	66	52.8	10	----	52.8	0.0	5	-5.0
Receiver15	15	1	0.0	58.9	66	58.9	10	----	58.9	0.0	5	-5.0
Receiver16	16	1	0.0	55.5	66	55.5	10	----	55.5	0.0	5	-5.0
Receiver17	17	1	0.0	53.4	66	53.4	10	----	53.4	0.0	5	-5.0
Receiver18	18	1	0.0	60.2	66	60.2	10	----	60.2	0.0	5	-5.0
Receiver19	19	1	0.0	61.3	66	61.3	10	----	61.3	0.0	5	-5.0
Receiver20	20	1	0.0	60.6	66	60.6	10	----	60.6	0.0	5	-5.0
Receiver21	21	1	0.0	58.0	66	58.0	10	----	58.0	0.0	5	-5.0
Receiver22	22	1	0.0	57.8	66	57.8	10	----	57.8	0.0	5	-5.0
Receiver23	23	1	0.0	57.6	66	57.6	10	----	57.6	0.0	5	-5.0
Receiver24	24	1	0.0	61.2	66	61.2	10	----	61.2	0.0	5	-5.0
Receiver25	25	1	0.0	57.9	66	57.9	10	----	57.9	0.0	5	-5.0

Receiver26	26	1	0.0	58.8	66	58.8	10	----	58.8	0.0	5	-5.0
Receiver27	27	1	0.0	64.0	66	64.0	10	----	64.0	0.0	5	-5.0
Receiver28	28	1	0.0	58.9	66	58.9	10	----	58.9	0.0	5	-5.0
Receiver29	29	1	0.0	60.9	66	60.9	10	----	60.9	0.0	5	-5.0
Receiver30	30	1	0.0	61.0	66	61.0	10	----	61.0	0.0	5	-5.0
Receiver31	31	1	0.0	61.1	66	61.1	10	----	61.1	0.0	5	-5.0
Receiver32	32	1	0.0	61.0	66	61.0	10	----	61.0	0.0	5	-5.0
Receiver33	33	1	0.0	61.1	66	61.1	10	----	61.1	0.0	5	-5.0
Receiver34	34	1	0.0	59.0	66	59.0	10	----	59.0	0.0	5	-5.0
Receiver35	35	1	0.0	58.9	66	58.9	10	----	58.9	0.0	5	-5.0
Receiver36	36	1	0.0	59.2	66	59.2	10	----	59.2	0.0	5	-5.0
Receiver37	37	1	0.0	64.8	66	64.8	10	----	64.8	0.0	5	-5.0
Receiver38	38	1	0.0	64.1	66	64.1	10	----	64.1	0.0	5	-5.0
Receiver39	39	1	0.0	63.6	66	63.6	10	----	63.6	0.0	5	-5.0
Receiver40	40	1	0.0	63.0	66	63.0	10	----	63.0	0.0	5	-5.0
Receiver41	41	1	0.0	63.0	66	63.0	10	----	63.0	0.0	5	-5.0
Receiver42	42	1	0.0	64.5	66	64.5	10	----	64.5	0.0	5	-5.0
Receiver43	43	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	5	-5.0
Receiver44	44	1	0.0	65.4	66	65.4	10	----	65.4	0.0	5	-5.0
Receiver45	45	1	0.0	64.7	66	64.7	10	----	64.7	0.0	5	-5.0
Receiver46	46	1	0.0	64.9	66	64.9	10	----	64.9	0.0	5	-5.0
Receiver47	47	1	0.0	61.2	66	61.2	10	----	61.2	0.0	5	-5.0
Receiver48	48	1	0.0	60.3	66	60.3	10	----	60.3	0.0	5	-5.0
Receiver49	49	1	0.0	60.3	66	60.3	10	----	60.3	0.0	5	-5.0
Receiver50	50	1	0.0	60.2	66	60.2	10	----	60.2	0.0	5	-5.0
Receiver51	51	1	0.0	60.1	66	60.1	10	----	60.1	0.0	5	-5.0
Receiver52	52	1	0.0	59.7	66	59.7	10	----	59.7	0.0	5	-5.0
Receiver53	53	1	0.0	60.4	66	60.4	10	----	60.4	0.0	5	-5.0
Receiver54	54	1	0.0	61.5	66	61.5	10	----	61.5	0.0	5	-5.0
Receiver55	55	1	0.0	61.5	66	61.5	10	----	61.5	0.0	5	-5.0
Receiver56	56	1	0.0	58.3	66	58.3	10	----	58.3	0.0	5	-5.0
Receiver57	57	1	0.0	62.2	66	62.2	10	----	62.2	0.0	5	-5.0
Receiver58	58	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	5	-5.0
Receiver59	59	1	0.0	55.9	66	55.9	10	----	55.9	0.0	5	-5.0
Receiver60	60	1	0.0	57.2	66	57.2	10	----	57.2	0.0	5	-5.0
Receiver61	61	1	0.0	57.0	66	57.0	10	----	57.0	0.0	5	-5.0
Receiver62	62	1	0.0	58.0	66	58.0	10	----	58.0	0.0	5	-5.0
Receiver63	63	1	0.0	59.8	66	59.8	10	----	59.8	0.0	5	-5.0
Receiver64	64	1	0.0	56.9	66	56.9	10	----	56.9	0.0	5	-5.0
Receiver65	65	1	0.0	56.8	66	56.8	10	----	56.8	0.0	5	-5.0
Receiver66	66	1	0.0	56.1	66	56.1	10	----	56.1	0.0	5	-5.0
Receiver67	67	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0

Receiver68	68	1	0.0	55.6	66	55.6	10	----	55.6	0.0	5	-5.0
Receiver69	69	1	0.0	60.8	66	60.8	10	----	60.8	0.0	5	-5.0
Receiver70	70	1	0.0	55.7	66	55.7	10	----	55.7	0.0	5	-5.0
Receiver71	71	1	0.0	54.6	66	54.6	10	----	54.6	0.0	5	-5.0
Receiver72	72	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0
Receiver73	73	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver74	74	1	0.0	53.2	66	53.2	10	----	53.2	0.0	5	-5.0
Receiver75	75	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver76	76	1	0.0	54.3	66	54.3	10	----	54.3	0.0	5	-5.0
Receiver77	77	1	0.0	55.0	66	55.0	10	----	55.0	0.0	5	-5.0
Receiver78	78	1	0.0	58.6	66	58.6	10	----	58.6	0.0	5	-5.0
Receiver79	79	1	0.0	60.5	66	60.5	10	----	60.5	0.0	5	-5.0
Receiver80	80	1	0.0	54.9	66	54.9	10	----	54.9	0.0	5	-5.0
Receiver81	81	1	0.0	58.8	66	58.8	10	----	58.8	0.0	5	-5.0
Receiver82	82	1	0.0	54.3	66	54.3	10	----	54.3	0.0	5	-5.0
Receiver83	83	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver84	84	1	0.0	53.2	66	53.2	10	----	53.2	0.0	5	-5.0
Receiver85	85	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver86	86	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver87	87	1	0.0	55.3	66	55.3	10	----	55.3	0.0	5	-5.0
Receiver88	88	1	0.0	62.0	66	62.0	10	----	62.0	0.0	5	-5.0
Receiver89	89	1	0.0	53.6	66	53.6	10	----	53.6	0.0	5	-5.0
Receiver90	90	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver91	91	1	0.0	52.0	66	52.0	10	----	52.0	0.0	5	-5.0
Receiver92	92	1	0.0	57.6	66	57.6	10	----	57.6	0.0	5	-5.0
Receiver93	93	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver94	94	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver95	95	1	0.0	49.1	66	49.1	10	----	49.1	0.0	5	-5.0
Receiver96	96	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver97	97	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver98	98	1	0.0	49.1	66	49.1	10	----	49.1	0.0	5	-5.0
Receiver99	99	1	0.0	49.1	66	49.1	10	----	49.1	0.0	5	-5.0
Receiver100	100	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver101	101	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver102	102	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0
Receiver103	103	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver104	104	1	0.0	48.5	66	48.5	10	----	48.5	0.0	5	-5.0
Receiver105	105	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	5	-5.0
Receiver106	106	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver107	107	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Receiver108	108	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Receiver109	109	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0

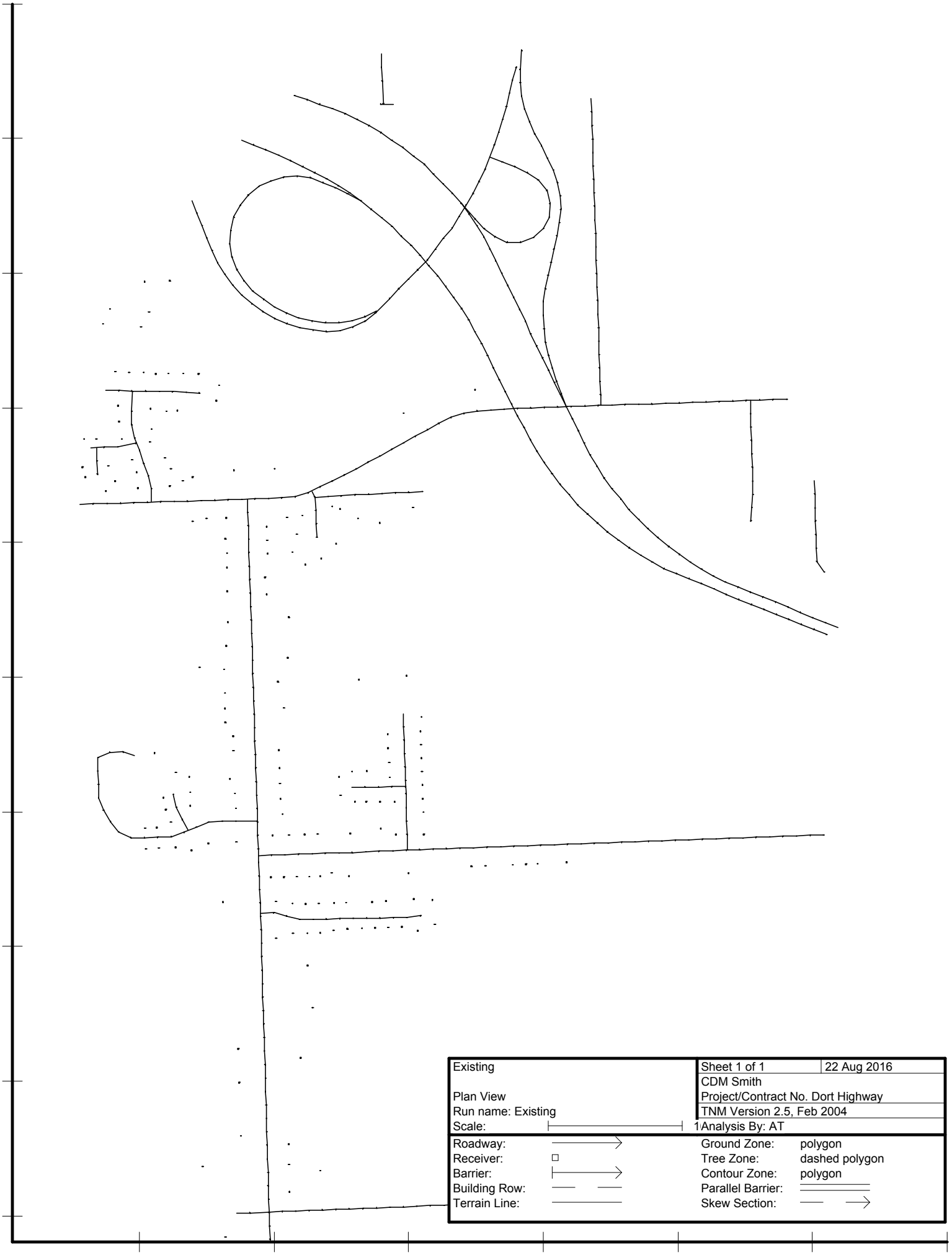
Receiver110	110	1	0.0	53.9	66	53.9	10	----	53.9	0.0	5	-5.0
Receiver111	111	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	5	-5.0
Receiver113	113	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver114	114	1	0.0	51.5	66	51.5	10	----	51.5	0.0	5	-5.0
Receiver115	115	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver116	116	1	0.0	48.8	66	48.8	10	----	48.8	0.0	5	-5.0
Receiver117	117	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver118	118	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver119	119	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver120	120	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver121	121	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver122	122	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver123	123	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver124	124	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver125	125	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver126	126	1	0.0	51.0	66	51.0	10	----	51.0	0.0	5	-5.0
Receiver127	127	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver128	128	1	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Receiver129	129	1	0.0	51.4	66	51.4	10	----	51.4	0.0	5	-5.0
Receiver130	130	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver131	131	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
Receiver132	132	1	0.0	55.3	66	55.3	10	----	55.3	0.0	5	-5.0
Receiver133	133	1	0.0	63.0	66	63.0	10	----	63.0	0.0	5	-5.0
Receiver134	134	1	0.0	58.7	66	58.7	10	----	58.7	0.0	5	-5.0
Receiver135	135	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Receiver136	136	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Receiver137	137	1	0.0	56.6	66	56.6	10	----	56.6	0.0	5	-5.0
Receiver138	138	1	0.0	62.8	66	62.8	10	----	62.8	0.0	5	-5.0
Receiver139	139	1	0.0	50.9	66	50.9	10	----	50.9	0.0	5	-5.0
Receiver140	140	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
Receiver141	141	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver142	142	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver143	143	1	0.0	52.1	66	52.1	10	----	52.1	0.0	5	-5.0
Receiver144	144	1	0.0	53.9	66	53.9	10	----	53.9	0.0	5	-5.0
Receiver145	145	1	0.0	56.0	66	56.0	10	----	56.0	0.0	5	-5.0
Receiver146	146	1	0.0	62.5	66	62.5	10	----	62.5	0.0	5	-5.0
Receiver147	147	1	0.0	53.9	66	53.9	10	----	53.9	0.0	5	-5.0
Receiver148	148	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver149	149	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver150	150	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver151	151	1	0.0	50.2	66	50.2	10	----	50.2	0.0	5	-5.0
Receiver152	152	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0

Receiver153	153	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
Receiver154	154	1	0.0	50.8	66	50.8	10	----	50.8	0.0	5	-5.0
Receiver155	155	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver156	156	1	0.0	50.6	66	50.6	10	----	50.6	0.0	5	-5.0
Receiver157	157	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
Receiver158	158	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver159	159	1	0.0	49.7	66	49.7	10	----	49.7	0.0	5	-5.0
Receiver160	160	1	0.0	49.4	66	49.4	10	----	49.4	0.0	5	-5.0
Receiver161	161	1	0.0	55.5	66	55.5	10	----	55.5	0.0	5	-5.0
Receiver162	162	1	0.0	52.7	66	52.7	10	----	52.7	0.0	5	-5.0
Receiver163	163	1	0.0	53.3	66	53.3	10	----	53.3	0.0	5	-5.0
Receiver164	164	1	0.0	49.3	66	49.3	10	----	49.3	0.0	5	-5.0
Receiver165	165	1	0.0	49.9	66	49.9	10	----	49.9	0.0	5	-5.0
Receiver166	166	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver167	167	1	0.0	49.2	66	49.2	10	----	49.2	0.0	5	-5.0
Receiver168	168	1	0.0	48.6	66	48.6	10	----	48.6	0.0	5	-5.0
Receiver169	169	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver170	170	1	0.0	49.6	66	49.6	10	----	49.6	0.0	5	-5.0
Receiver171	171	1	0.0	48.9	66	48.9	10	----	48.9	0.0	5	-5.0
Receiver172	172	1	0.0	50.5	66	50.5	10	----	50.5	0.0	5	-5.0
Receiver173	173	1	0.0	49.0	66	49.0	10	----	49.0	0.0	5	-5.0
Receiver174	174	1	0.0	53.8	66	53.8	10	----	53.8	0.0	5	-5.0
Receiver175	175	1	0.0	52.8	66	52.8	10	----	52.8	0.0	5	-5.0
Receiver176	176	1	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Receiver177	177	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver178	178	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver179	179	1	0.0	50.1	66	50.1	10	----	50.1	0.0	5	-5.0
Receiver180	180	1	0.0	50.4	66	50.4	10	----	50.4	0.0	5	-5.0
Receiver181	181	1	0.0	51.1	66	51.1	10	----	51.1	0.0	5	-5.0
Receiver182	182	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
Receiver183	183	1	0.0	51.6	66	51.6	10	----	51.6	0.0	5	-5.0
Receiver184	184	1	0.0	51.8	66	51.8	10	----	51.8	0.0	5	-5.0
Receiver185	185	1	0.0	55.8	66	55.8	10	----	55.8	0.0	5	-5.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		184	0.0	0.0	0.0
All Impacted		4	0.0	0.0	0.0
All that meet NR Goal		0	0.0	0.0	0.0

Appendix D

TNM Printouts



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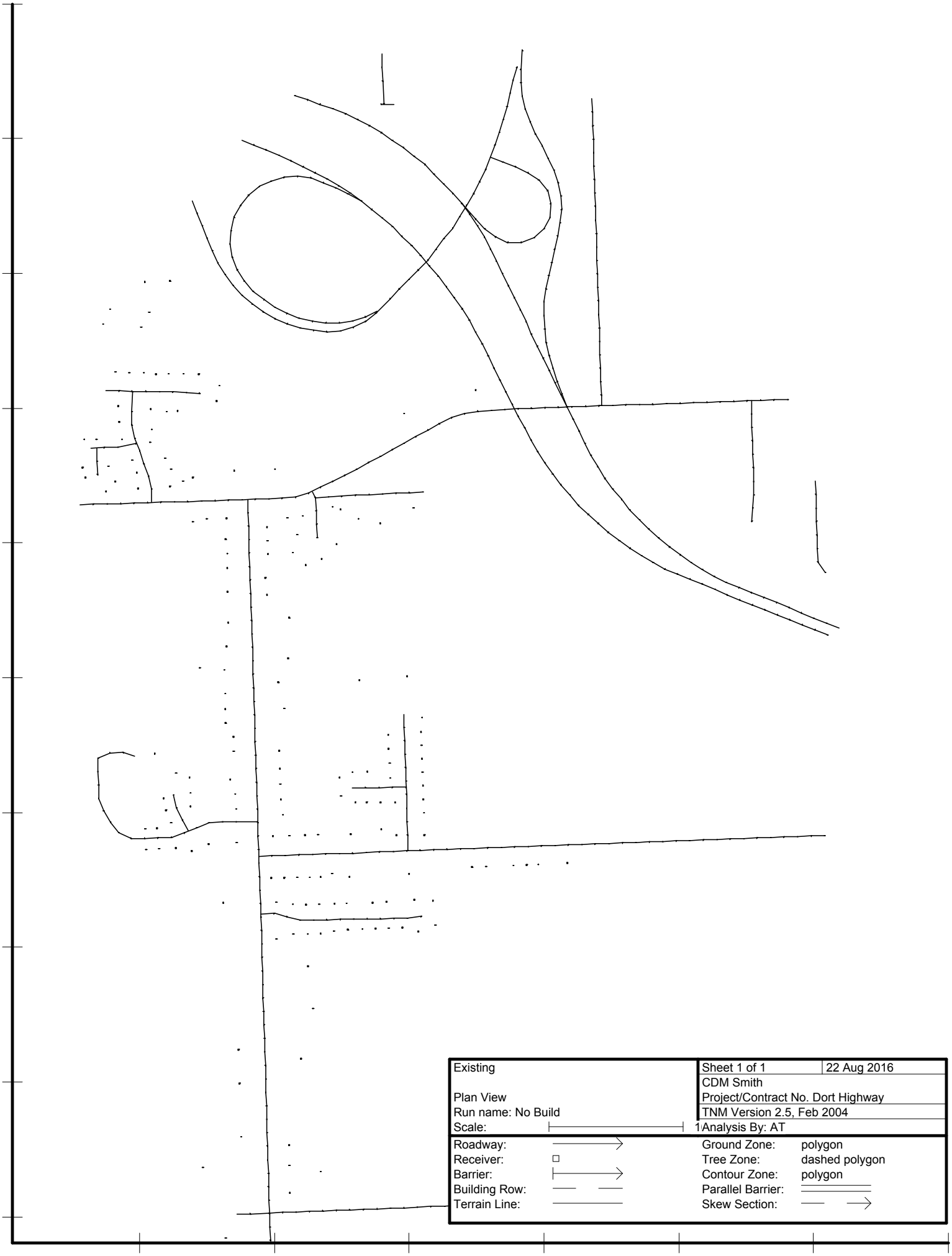
Terrain Line:		Skew Section:	



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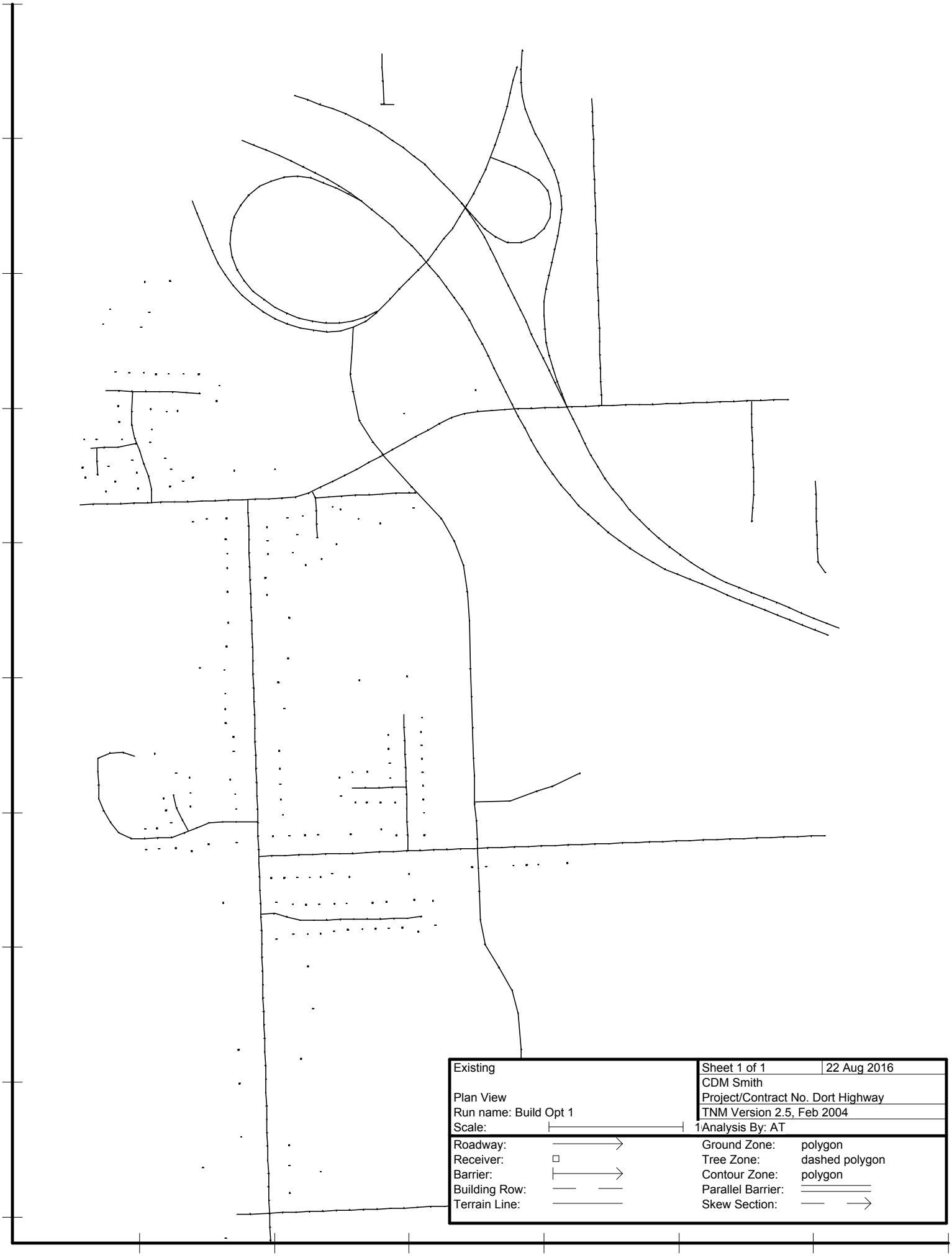

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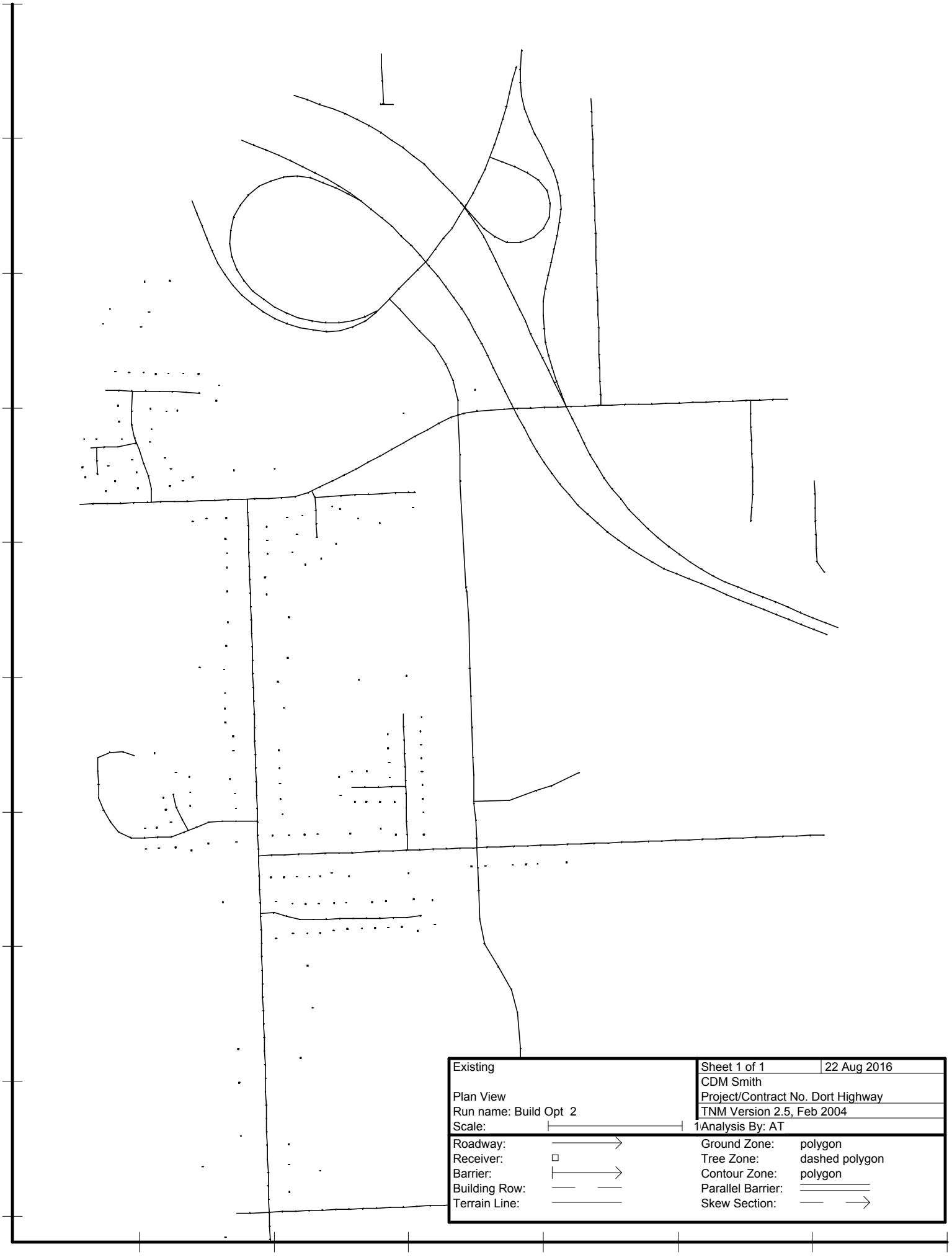
Terrain Line:		Skew Section:	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Barrier:
Building Row:
Terrain Line:
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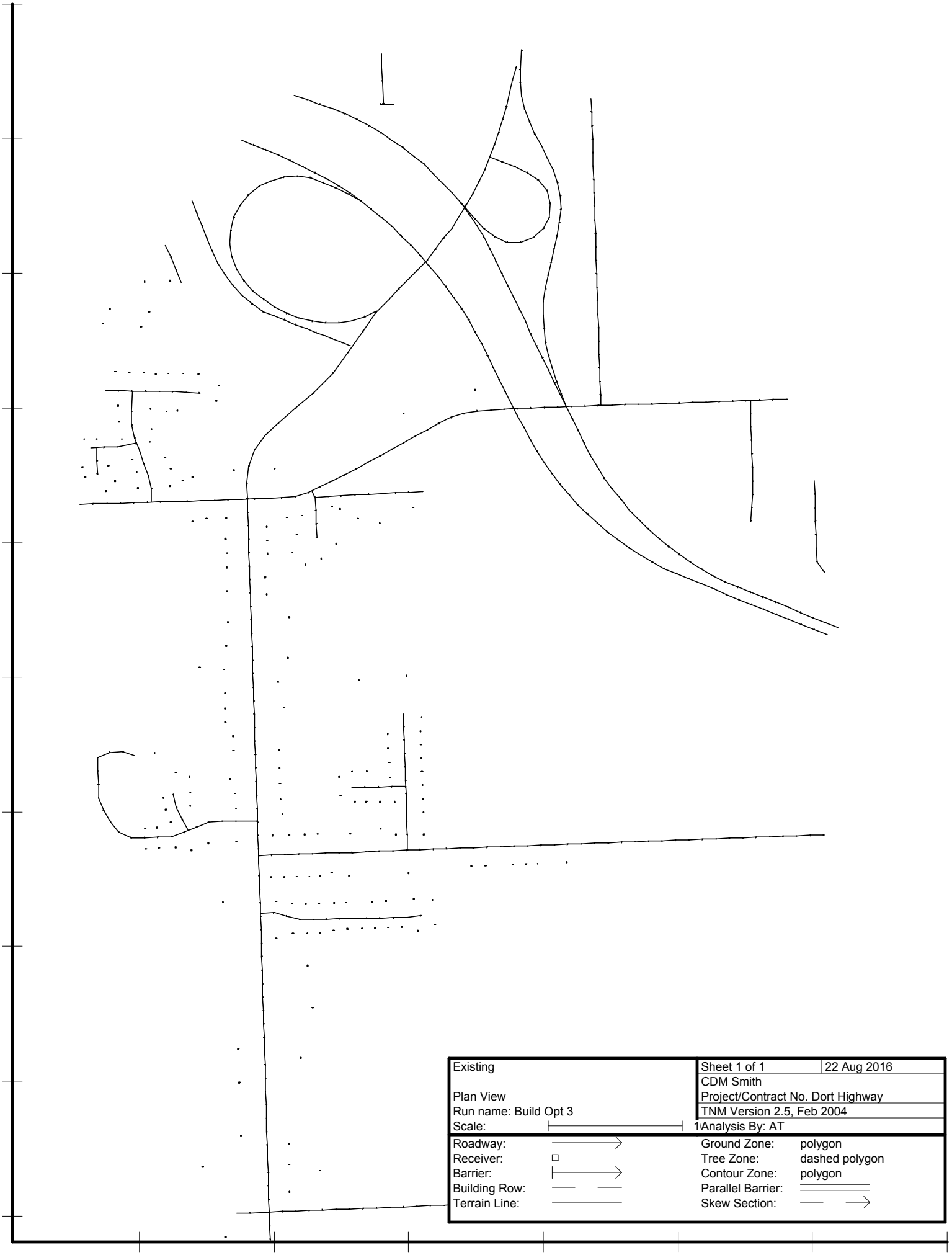

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Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

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APPENDIX D

AIR QUALITY IMPACT ANALYSIS

REVISED
DRAFT REPORT

Dort Highway Corridor Extension Project Genesee County

Air Quality Analysis

Michigan Department of Transportation

December 2016

CDM Smith

Table of Contents

List of Figures

List of Tables

Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
ADT	average daily traffic
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Michigan Department of Environmental Quality
EPA	United States Environmental Protection Agency
FHWA	Federal Highway Administration
FR	Federal Register
FTA	Federal Transit Administration
GCMPC	Genesee County Metropolitan Planning Commission
LOS	Level of Service
MDOT	Michigan Department of Transportation
mg/m^3	milligrams per cubic meter
MPO	Metropolitan Planning Organization
MSAT	mobile source air toxics
N/A	not applicable
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
O_3	ozone
Pb	lead
PM	particulate matter
PM_{10}	inhalable particulate matter

$PM_{2.5}$	fine particulate matter
ppb	parts per billion
ppm	parts per million
SIP	State Implementation Plan
SO_2	sulfur dioxide
TIP	Transportation Improvement Plan
USC	United States Code
VMT	vehicle miles traveled
VOC	volatile organic compound

Executive Summary

The Genesee County Road Commission is proposing to extend Dort Highway (M-54) south from I-75 to Baldwin Road in Grand Blanc Township, Genesee County. Currently Dort Highway ends at I-75 (Exit 109). Genesys Health Park, one of the largest employers in the county, is currently served by the Holly Road interchange (Exit 108), one interchange south of the Dort Highway terminus. The Holly Road interchange is operating at a level of service D and approaching capacity. The proposed extension would provide additional access to the Genesys Health Park campus, significantly relieve congestion, and improve safety. Three build alternatives – Option 1, Option 2, and Option 3, McWain Road were evaluated in this air quality analysis.

The study area is located in Genesee County which is in attainment of all National Ambient Air Quality Standards (NAAQS). The project does not involve a significant number of diesel vehicles and the proposed project intersections operate at a LOS C or better for the Build condition. This project will not create a facility that is likely to significantly increase emissions. Therefore, it is not anticipated to create any adverse effects on the air quality of this attainment area. The proposed project meets all Transportation Conformity requirements.

Section 1
Introduction

This section describes the proposed project and the alternatives.

1.1 Project Description

The Genesee County Road Commission is proposing to extend Dort Highway (M-54) south from I-75 to Baldwin Road in Grand Blanc Township, Genesee County. Currently Dort Highway ends at I-75 (Exit 109). Genesys Health Park, one of the largest employers in the county, is currently served by the Holly Road interchange (Exit 108), one interchange south of the Dort Highway terminus. The Holly Road interchange is operating at a level of service D and approaching capacity. The proposed project is an extension of Dort Highway south from I-75/M-54 north (Exit 109) to Baldwin Road. The proposed extension would provide additional access to the Genesys Health Park campus, significantly relieve congestion, and improve safety.

The Dort Highway extension project has been in various stages of development for more than 40 years. This extension has been included in all succeeding regional transportation plans, including the most recent, Freight and Connectivity Study, 2009. The Dort Highway extension project is also supported locally by Grand Blanc Township, as expressed in the Township's Master Plan (2013 Supplemental Amendment), as a key component of a planned Technology Village encompassing 4,000 acres including the Genesys Health Park campus. The preliminary design includes two lanes in each direction with turn lanes at intersections and a shared use path and sidewalks.

Land uses within the study area is primarily residential adjacent to I-75 and other institutional/commercial land uses to the east. The proposed project study area with alternatives are shown in **Figure 1-1**.

Three build alternatives for the Dort Highway extension were considered for a more detailed study. The alternatives included:

- Option 1

  This alternative is the Preferred Alternative and meets all the criteria stated in the Purpose and Need of the project. The corridor is proposed to be a two-lane road with a lane in each direction and a center two-way, left turn lane. It begins with a roundabout on the west side of I-75, which connects the existing north and south I-75 ramps at Dort Highway (Exit 109). The roundabout is located approximately 500 feet southwest of the existing I-75 bridge. There is also a roundabout on the east side of I-75, which connects the I-75 entrance and exit ramps to Dort Highway. From the roundabout on the west side of I-75, the new Dort Highway extension utilizes a reverse horizontal curve and turns south to cross Cook Road at a 90-degree angle. The roadway continues south beyond Cook Road and parallels the Consumers Energy right-of-way. South of Cook Road, it intersects with Pollock Road, then continues south and ties into Baldwin Road at a 90-degree angle.

- Option 2

  This alternative is a slight variation on Option 1, in that the extension of Dort Highway would begin on the west side of I-75 slightly east of the connection to the ramp proposed in Build Option 1. The extension would then proceed to the southeast and intersect with Cook Road east of the intersection proposed for Build Option 1. At this point, the road extension would curve south and connect at the same location as proposed for Option 1.

- Option 3 McWain Road

  This alternative includes extending Dort Highway south and west to intersect with the existing ROW for McWain Road south of Cook Road. Property would need to be acquired at the northern end of the extension to make the connection to the existing ramp. The road section would be similar to the Build Alternative 1. The McWain Road ROW varies in width south of the Cook Road/McWain Road Intersection. Additional ROW will be needed where existing ROW is insufficient. Also, grading easements will be required throughout this area of the alignment.

Dort Highway Extension

Genesee County, MI

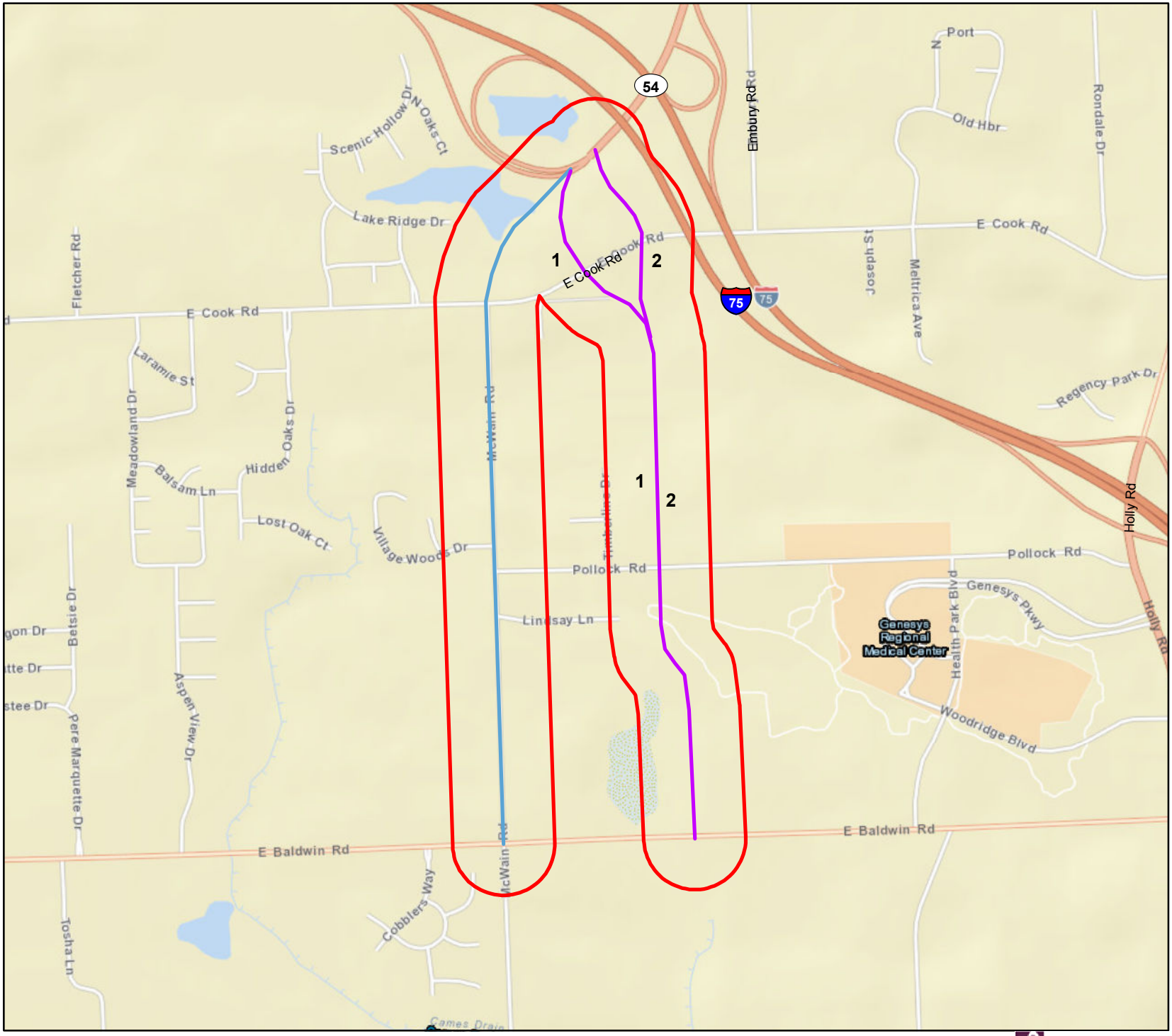
Project Vicinity Map

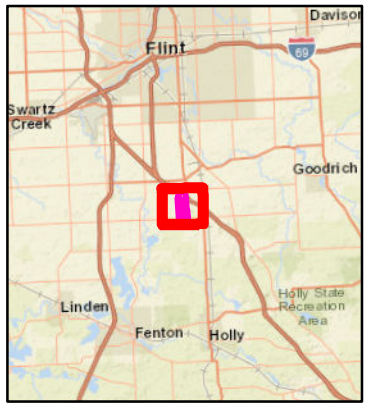
Figure 1-1

Legend

Alignment Alternative

- McWain Road Option
- Options 1 and 2
- Project Area Boundary





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0 0.5 1 Miles

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Rowe Professional Services Company

1.2 Traffic Volumes in the Study Area

The existing (2015) and projected design year 2040 average daily traffic (ADT) volumes provided by the MDOT Traffic volumes for I-75 and M-54 in October 2015 within the study area are shown in **Table 1-1**. Traffic volumes are expected to grow approximately 120 percent from existing levels to 2040. In 2015 and 2040, four percent of the ADT is estimated to be trucks. All future build and no build alternatives are anticipated to have the same ADT.

Table 1-1 Annual Average Daily Traffic in the Study Area

Roadway Segment	Existing (2015) ADT	Design Year (2040)	
		ADT	% Growth from Existing
Dort Highway (M-54) between I-75 & Grand Blanc Road	13,050	15,600	120%

Note: MDOT 2015
Key: ADT = average daily traffic

Section 2
Regulatory Framework

Air quality management and protection responsibilities exist in federal, state, and local levels of government. The federal Clean Air Act (CAA) is the primary statue that establishes ambient air quality standards and establishes regulatory authorities to enforce regulations designed to attain those standards. The United States Environmental Protection Agency (EPA) is responsible for implementation of the CAA. The CAA was enacted in 1955 and was amended in 1963, 1965, 1967, 1970, 1977, 1990, and 1997. Michigan Department of Environmental Quality's (DEQ) Air Quality Division operates the air quality monitoring program, implements the permit program, and works with Metropolitan Planning Organizations (MPOs) and MDOT during transportation planning. Air Quality permitting is not relevant to transportation projects.

2.1 Criteria Pollutants

EPA regulates seven common pollutants called criteria pollutants. They include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and sulfur dioxide (SO_2). Each pollutant is described below.

Carbon Monoxide

CO is a colorless, odorless gas that is highly toxic. It is formed by the incomplete combustion of fuels. Exposure to CO can reduce the body's ability to carry oxygen. CO exposure can cause people with several types of heart disease to experience chest pain (angina) when exercising or under increased stress. Extremely high levels of CO can cause death (EPA 2016a).

Lead

Lead is a soft and chemically resistant metal that is naturally found in the environment. It has historically been found in motor vehicles and industrial sources, which lead to the EPA's efforts to remove Pb from gasoline in 1980 and beyond. The aviation sector continues to be a major source of Pb emissions from piston aircraft, as are certain industrial sectors like ore and metals processing (EPA 2015). Emissions of Pb from the study area are minimal (EPA 2011).

In addition to Pb exposure through air, Pb can also accumulate in soils and other sediments, especially in urban environments where it would have accumulated from years of exposure from leaded gasoline. Pb exposure can adversely affect the nervous system, kidney function, immune system, reproductive and development systems, and the cardiovascular system. Pb exposure may also contribute to behavioral problems, learning deficits, and lowered IQ in infants and young children (EPA 2015).

Nitrogen Dioxide

NO_2 is a reddish-brown to dark brown reactive gas that is formed during high-temperature combustion processes, such as those occurring in trucks, cars, and power plants. The sum of nitric oxide and NO_2 is commonly called nitrogen oxides (NOx), but other oxides like nitrous oxide and

nitric acid are also classified as NOx. Mobile sources are the main sources of NOx in Genesee County (EPA 2011).

Exposure to NO_2 can cause adverse respiratory effects including airway inflammation. NOx can react with ammonia, moisture, and other compounds to form small particles that can lodge deeply into sensitive parts of the lungs. This action can cause or worsen respiratory disease like emphysema and bronchitis, or can aggregative existing heart disease (EPA 2016b).

Ozone

O_3 is a highly reactive and unstable gas that is formed in the atmosphere through complex reactions with sunlight, NOx, and volatile organic compounds (VOCs). Hot, sunny, and calm days promote O_3 formation. The EPA regulates ground-level O_3, which is not to be confused with stratospheric O_3. Ground-level O_3 is close to where people live, breathe, and exercise and can cause adverse health effects; stratospheric O_3 is high in the atmosphere and reduces the amount of ultraviolet light entering the earth's atmosphere, which actually helps protect animal and plant life.

Certain people are particularly sensitive to the effects of O_3 including people with lung disease, children, older adults, and active people. Generally, as O_3 concentrations increase, both the number of people affected and the seriousness of the health effects increase. The effects of exposure to ground-level O_3 include cough, chest tightness, and pain upon taking a deep breath; worsening of wheezing and other asthma symptoms; reduced lung function; and increase hospitalizations for respiratory causes.

O_3 also has detrimental effects on the environment. O_3 exposure can damage cells and leaf tissue, reducing plants' ability to photosynthesize and produce food. Plants will grow more leaves in an attempt to produce more food, but this response has the net effect of making plants more susceptible for disease, pests, cold, and drought. O_3 can also damage materials like rubber, plastics, fabrics, paint and metals (EPA 2003; EPA 2009). Over 70 percent of Genesee County's VOC emissions come from mobile sources, biogenics, and solvents (EPA 2011).

Particulate Matter

Particulate matter (PM) consists of solid and liquid particles of dust, soot, aerosols, and other matter small enough to remain suspended in the air for a long period of time. PM is divided into two size classes of particles: particles 10 microns[1] and smaller (PM_{10}) and particles 2.5 microns and smaller ($PM_{2.5}$). To place the sizes in perspective, a human hair is approximately 60 microns in diameter, which makes it six times larger than the largest coarse particle and over 20 times larger than the largest fine particle.

Primary particles are those that are directly emitted from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Burning fuels primarily produces $PM_{2.5}$, while other sources like windblown dust contribute to PM_{10} emissions. Secondary formation of $PM_{2.5}$ can occur from complex reactions in the atmosphere of pollutants like NOx, sulfur oxides, VOCs, and ammonia. Most of the $PM_{2.5}$ pollution in the United States occurs from these secondary reactions as

[1] A micron is a unit of measurement that is one-millionth of a meter. A meter is slightly larger than 3 feet.

opposed to direct (primary) emissions. Main sources of PM_{10} and $PM_{2.5}$ in Genesee County are fugitive dust and fuel combustion (EPA 2011).

Particles smaller than 10 microns (i.e., PM_{10} and $PM_{2.5}$) represent that portion of PM thought to represent the greatest hazard to public health because they can become deeply embedded in someone's lungs. This can lead to adverse health effects including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms (e.g., irritation of the airways, coughing, or difficulty breathing). Aside from adverse health effects, $PM_{2.5}$ is primarily responsible for reduced visibility (haze) in the United States. PM can also cause aesthetic damage by staining or damaging stone and other materials (EPA 2016c; EPA 2016d).

Sulfur Dioxide

SO_2 is formed when locomotives, ships, and non-road diesel equipment burn sulfur-containing fuel. Certain industrial processes, such as petroleum refining and metal processing, also contribute to SO_2 emissions. Health effects of SO_2 exposure including bronchoconstriction and increased asthma symptoms. SO_2 can also react with other compounds in the atmosphere to form small particles. Exposure to the resulting particles can aggravate existing heart disease, leading to increased hospital admissions and premature death (EPA 2016e).

2.2 National Ambient Air Quality Standards

Under authority of the CAA, EPA established National Ambient Air Quality Standards (NAAQS) for CO, Pb, NO_2, O_3, PM_{10}, $PM_{2.5}$, and SO_2. **Table 2-1** presents the current NAAQS for the criteria pollutants. The federal CAA requires states to classify air quality control regions (or portions thereof) as either attainment or nonattainment with respect to criteria air pollutants, based on whether the NAAQS have been achieved.

Table 2-1 National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS Primary	NAAQS Secondary	Violation Criteria
CO	1 Hour	35 ppm	N/A	Not to be exceeded more than once per year
	8 Hour	9 ppm	N/A	Not to be exceeded more than once per year
NO_2	1 Hour	100 ppb	N/A	98th percentile of 1-hour daily maximum concentrations, averaged over three years
	Annual	53 ppb	Same as Primary Standard	Annual mean
O_3	8 Hour	0.070 ppm	Same as Primary Standard	Annual fourth-highest daily maximum 8-hour concentration, averaged over three years
Pb	Rolling 3-Month Average	0.15 µg/m^3	Same as Primary Standard	Not to be exceeded
PM_{10}	24 Hour	150 µg/m^3	Same as Primary Standard	Not to be exceeded more than once per year on average over three years
$PM_{2.5}$	24 Hour	35 µg/m^3	Same as Primary Standard	98th percentile, averaged over three years
	Annual	12.0 µg/m^3	15.0 µg/m^3	Annual mean, averaged over three years

Pollutant	Averaging Time	NAAQS Primary	NAAQS Secondary	Violation Criteria
SO_2	1 Hour	75 ppb	N/A	99th percentile of 1-hour daily maximum concentrations, averaged over three years
	3 Hour	N/A	0.5 ppm	Not to be exceeded more than once per year
	24 Hour (1)	0.14 ppm	N/A	Not to be exceeded more than once per year
	Annual (1)	0.030 ppm	N/A	Annual mean

Source: EPA 2016f; 40 CFR 50

Note:

(1) On June 22, 2010, the 24-hour and annual primary SO_2 NAAQS were revoked (75 Federal Register [FR] 35520). The 1971 SO_2 NAAQS (0.14 parts per million [ppm] and 0.030 ppm for 24-hour and annual averaging periods) remain in effect until one year after an area is designated for the 2010 1-hour primary standard. EPA has designated parts of 16 states as nonattainment, effective October 4, 2013 (78 FR 47191). EPA is required to complete the remaining SO_2 designations by July 2, 2016, December 31, 2017, and December 31, 2020. As of the July 2, 2016 deadline, EPA has not completed the SO_2 designation for Genesee County (EPA 2016g). Based on ambient air quality collected between 2013 and 2015, there were no violations of the 2010 SO_2 NAAQS in any undesignated areas of Michigan (EPA 2016h).

Key:

µg/m³ = micrograms per cubic meter; CO = carbon monoxide; mg/m³ = milligrams per cubic meter; N/A = not applicable; NAAQS = National Ambient Air Quality Standard; NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead ; PM_{10} = inhalable particulate matter; $PM_{2.5}$ = fine particulate matter; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide

2.3 Attainment Status

Areas that exceed the NAAQS are designated as nonattainment. Areas that previously exceeded the NAAQS, but have since attained the standard, are called maintenance areas. States are also required to prepare State Implementation Plans (SIPs) containing emission reduction strategies to maintain the NAAQS for those areas designated as maintenance and to attain the NAAQS for those areas designated as nonattainment. The study area is within Genesee County, which is in attainment of all NAAQS (EPA 2016i).

Michigan has two National Core sites (Grand Rapids and Allen Park) that provide a full suite of measurements (ozone, SO_2, CO, NOx, $PM_{2.5}$, meteorological data) at a single location. 47 additional State and Local Monitoring Stations supplement the network for a broader spatial coverage. (DEQ 2016) The closest monitoring station to the study area is located in Flint (Site ID 260490021), however, only O_3 and $PM_{2.5}$ are monitored at this station. Data from other stations in Port Huron (Site ID 261470031), Dearborn (Site ID 261630033), Allen Park (Site ID 261630001), and Detroit (Site ID 26160093) were reviewed for other pollutants. The most recent three years of available data (2013-2015) are summarized in **Table 2-2**.

Table 2-2 Ambient (Background) Air Quality Data

Pollutant (1)	NAAQS	2013	2014	2015	Design Value (2013-2015)
CO (2)					
Maximum 1-hour concentration (ppm)	35	6.3	2.2	2.3	N/A
Maximum 8-hour concentration (ppm)	9	1.8	1.6	2.2	N/A
Pb (3)					
Maximum 3-month average concentration (µg/m³)	0.15	0.04	0.03	0.05	N/A

Pollutant [1]	NAAQS	2013	2014	2015	Design Value (2013-2015)
NO_2 [2]					
98th percentile 1-hour concentration (ppb)	100	48	51	50	50
Annual mean (ppb)	53	18	16	18	N/A
O_3 [4]					
4th high 8-hour concentration (ppm)	0.07	0.065	0.068	0.066	0.066
PM_{10} [5]					
Maximum 24-hour concentration (µg/m³)	150	62	80	66	N/A
$PM_{2.5}$ [4]					
98th percentile 24-hour concentration (µg/m³)	35	17	24	22	21
Annual mean (µg/m³)	12	7.4	8.9	8.2	8.2
SO_2 [6]					
99th Percentile 1-Hour concentration (ppb)	75	43	56	34	44
Maximum 24-hour concentration (ppb)	140	12.9	12.5	13.5	N/A
Annual mean (ppb)	30	1.25	1.64	1.18	N/A

Source: EPA 2016j.

Notes:

[1] An exceedance is not necessarily a violation. Violations are defined in 40 Code of Federal Regulations (CFR) 50.

[2] Data from Eliza Howell Park (Site ID 26160093), 23751 Fenkell Avenue, Detroit, MI.

[3] Data from Port Huron (Site ID 261470031) 324 Rural Street, Port Huron, MI.

[4] Data from Flint (Site ID 260490021) Whaley Park/360 Iowa Avenue, Flint, MI.

[5] Data from Dearborn (Site ID 261630033) 2842 Wyoming Avenue, Dearborn, MI.

[6] Data from Allen Park (Site ID 261630001), 14700 Goddard Road, Allen Park, MI. 3-hour average SO_2 concentrations were not available from EPA.

Key:

µg/m³ = micrograms per cubic meter; CO = carbon monoxide; N/A = not applicable; NAAQS = National Ambient Air Quality Standard; NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead; PM_{10} = inhalable particulate matter; $PM_{2.5}$ = fine particulate matter; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide

2.4 Transportation Conformity

Approval, funding, or implementation of Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) projects is subject to the transportation conformity regulations under the CAA (40 Code of Federal Regulations [CFR] 93 Subpart A). Each metropolitan planning area is required to develop an official metropolitan transportation plan pursuant to 23 CFR Part 450. If a potential project is included in a transportation plan and transportation improvement program (TIP) that conform to the SIP and the CAA Amendments, then the project is already included in the emission budgets developed for the region. Thus, a unique, regional analysis of project emissions would not be required; however, analysis regarding possible localized impacts is still required such as hot-spot (40 CFR 93.123) CO and PM conformity. The MPO, or the Genesee County Metropolitan Planning Commission (GCMPC) in the study area, is responsible for transportation planning and determining regional conformity.

In order for a FHWA/FTA project to be found to conform, regardless of whether it is in a conforming transportation plan or TIP or not, the following criteria and procedures must be followed:

- §93.110 – The conformity determination must be based upon the most recent planning assumptions in force at the time the conformity analysis begins.
- §93.111 – The conformity determination must be based on the latest emission estimation model available.
- §93.112 – Conformity must be determined according to the consultation procedures in 40 CFR 93 Subpart A.
- §93.114 – There must be a currently conforming transportation plan and currently conforming TIP at the time of project approval.
- §93.116 – The project must not cause or contribute to any new localized CO, PM10, and/or PM2.5 violations or increase the frequency of severity of any existing CO, PM_{10}, and $PM_{2.5}$ violations.
- §93.117 – The project must comply with any PM_{10} and $PM_{2.5}$ control measures in the applicable SIP.

Transportation conformity applies to nonattainment and maintenance areas. The study area is in attainment of all NAAQS, therefore, Genesee County is not required to demonstrate regional transportation conformity of long range or transportation improvement plans (GCMPC 2014).

2.5 Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources (e.g., cars, trucks, and construction equipment), non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories, refineries, and power plants). EPA has also recognized emissions of air toxics from mobile sources as a potential environmental and health concern. The interim guidance released by FHWA dated February 2007 requires discussion of Mobile Source Air Toxics (MSATs) in National Environmental Policy Act (NEPA) documents. The guidance was updated in September 2009 and December 2012.

FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents*, released on December 6, 2012 was used in the preparation of this report. This guidance advises on when and how to analyze MSATs in the NEPA process for highway projects. This guidance is interim because MSAT science is still evolving. Currently, there are limitations on tools and techniques for evaluating potential project-level health risks from MSAT exposure. FHWA regularly updates the guidance based on new scientific data.

Section 3
Impact Analysis

Impacts of the proposed project to the air quality in the study area are discussed in this section.

3.1 Vehicle Emissions

The impact resulting from a new transportation project ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new roadway or an existing highway facility.

3.1.1 Criteria Pollutants

Motor vehicles emit CO, NOx, VOC, PM_{10}, $PM_{2.5}$, SO_2, and Pb (listed in order of decreasing emission rate). Emissions of criteria pollutants as a result of the implementation of the project are discussed below. Since the study area is in attainment for all criteria pollutants, only CO, PM_{10} and $PM_{2.5}$ are investigated for localized or hot-spot analyses.

Carbon Monoxide

Motor vehicles are considered a main source of CO in the study area (EPA 2011). CO levels measured near the study area are well below the NAAQS, and this project is not expected to produce a projected violation of the CO NAAQS.

Projects in attainment areas would still be required to conduct a CO hot-spot analysis if the project is expected to affect intersections that are at Level of Service (LOS) D, E, or F or those that would change the LOS of an intersection to D, E, or F due to increased traffic volumes related to the project (40 CFR 93.123). The proposed project would relieve congestion at the I-75/Holly Road interchange and roundabouts would be constructed at new intersections. Based on the traffic analysis completed for the project, the study area intersections are expected to function at LOS D or better. The proposed project is not anticipated to cause adverse impacts on intersections and local air quality, therefore, no additional project-level analysis is required.

Particulate Matter

Motor vehicles are not regarded as significant sources of PM_{10} and $PM_{2.5}$. Nationwide, highway sources account for less than seven percent of PM emissions. PM_{10}, and $PM_{2.5}$ emissions are predominantly the result of non-highway sources (e.g., industrial, commercial, and agricultural). Because emissions of PM_{10} from automobiles are very low and current monitored levels are well below the NAAQS, the traffic on the project will not cause air quality standards for PM_{10} to exceed the NAAQS. The study area is in attainment of PM_{10} NAAQS (EPA 2016i).

Projects in $PM_{2.5}$ nonattainment areas that has a significant number of diesel vehicles, is anticipated to significantly increase the number of diesel vehicles, is anticipated to affect intersections that are LOS D, E, or F, or is anticipated to change the LOS of an intersection to D, E, or F are required to conduct a hot-spot analysis (40 CFR 93.123). Projects that involve bus and rail terminals are often

subject to this requirement due to increase in diesel use. Facilities with AADT greater than 125,000 with 8 percent or more of that AADT as diesel trucks is considered to be significant (71 FR 12468). The study area is in attainment of $PM_{2.5}$ NAAQS, the AADT of this project is less than 125,000, and the truck percentage is 4 percent (EPA 2016i, MDOT 2015). The project is not expected to cause a significant increase in the number of diesel vehicles. Therefore, a $PM_{2.5}$ hot-spot analysis is not required.

3.1.2 Mobile Source Air Toxics

Motor vehicles contribute significantly to emissions of acrolein, benzene, 1,3-butadiene, diesel PM (including diesel exhaust organic gases), formaldehyde, naphthalene and polycyclic organic matter. Of these compounds, FHWA considers diesel PM as the dominant MSAT of concern.

The FHWA has developed a tiered approach for analyzing MSATs in NEPA documents, depending on the specific project circumstances:

- No analysis for projects with no potential for meaningful MSAT effects;
- Qualitative analysis for projects with low potential MSAT effects; or
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

The proposed project involves extending a highway and modifications an interchange. As shown in **Table 1-1**, using the traffic volumes provided by MDOT for I-75 and M-54 in October 2015 within the study area, the design year AADT for the proposed connection is projected to be less than the 140,000 to 150,000 vehicles per day FHWA criterion for a qualitative analysis; the project is expected to have low potential MSAT effects.

Vehicle mix is not anticipated to change due to this project; therefore, MSATs emitted would be proportional to the vehicle miles traveled (VMT). **Table 3-1** shows the estimated daily VMT for this project for each alternative. Also, speed may increase due to additional capacity increasing the efficiency of the transportation network.

Table 3-1 Estimated Daily Vehicle Miles Traveled

Project (VMT)	Existing (2015)	Design Year (2040)
Dort Highway	0	20,280

Note: VMT calculated based on corridor length (1.3 mi) and ADT from MDOT (2015). Because this is an extension of a highway, the existing VMT is zero.

EPA's national control programs are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turn over, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great, even after accounting for VMT growth, that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

MSAT science is still evolving and the available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternative evaluated in the Environmental Impact Statement. Due to these limitations, the following discussion is

included in accordance with CEQ regulations (40 CFR 1502.22) regarding incomplete or unavailable information.

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation, rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts -- each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that timeframe, since such information is unavailable. It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds and, in particular, for diesel PM.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing

risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities, plus improved access for emergency response, that are better suited for quantitative analysis.

3.2 Construction Emissions

Heavy construction equipment, including excavators, scrapers, graders, rollers, compactors, and pavers, may be used to clear and grub, excavate, grade, and pave for construction of new roadways. Contractors will be responsible for maintaining, repairing, and adjusting all construction equipment to keep them in full satisfactory condition to minimize pollutant emissions. Equipment emissions may be reduced by using newer, lower-emitting equipment, retrofitting older equipment engines, and controlling activity.

Measures should be taken to reduce any fugitive dust generated by construction activities. A dust control plan may be prepared to outline control methods specific to the construction site. Dust control methods may include watering areas of disturbance, covering haul trucks, stabilizing or covering stockpile areas, washing equipment to minimize track out, and reducing speeds on unpaved roads.

In accordance with 40 CFR 93.123(c)(5), CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established methods.

Section 4
Conclusions

The study area is located in Genesee County. Genesee County is in attainment of all NAAQS. The project does not involve a significant number of diesel vehicles and is not anticipated to significantly increase the number of diesel vehicles to warrant a $PM_{2.5}$ hot-spot analysis. Since the proposed project intersections operate at a LOS C or better, the project would not be required to conduct a project-level hot-spot analysis for CO.

No significant MSAT impacts are anticipated from this project. Air toxics analysis is a continuing area of research. At this time, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited.

Emissions from construction of the proposed project should be minimized using newer, lower-emitting equipment, retrofitting older equipment engines, controlling equipment activity and by implementing a dust control plan.

This project will not create a facility that is likely to significantly increase emissions. Therefore, it is not anticipated to create any adverse effects on the air quality of this attainment area. The proposed project meets all Transportation Conformity requirements.

Section 5
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APPENDIX E

DIRECTIONAL TRAFFIC COUNTS

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: Light rain last 10 minutes of
Incidents: Police called to investigate

File Name : 1001 McWain & Pollock 07-23-2015
Site Code : 10010004
Start Date : 07-23-2015
Page No : 1

Groups Printed- Cars - Trucks

	McWain Road Northbound					McWain Road Southbound					Eastbound					Pollock Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	3	1	0	4	5	1	0	0	6	0	0	0	0	0	0	0	1	0	1	11
07:15 AM	0	2	3	0	5	5	4	0	0	9	0	0	0	0	0	1	0	1	0	2	16
07:30 AM	0	0	2	0	2	9	1	0	0	10	0	0	0	1	1	1	0	9	1	11	24
07:45 AM	0	1	3	0	4	4	4	0	0	8	0	0	0	0	0	0	0	0	0	0	12
Total	0	6	9	0	15	23	10	0	0	33	0	0	0	1	1	2	0	11	1	14	63
08:00 AM	0	1	1	0	2	2	1	0	0	3	0	0	0	0	0	2	0	3	0	5	10
08:15 AM	0	3	2	0	5	7	1	0	0	8	0	0	0	0	0	3	0	4	0	7	20
08:30 AM	0	3	2	0	5	4	2	0	0	6	0	0	0	0	0	3	0	1	0	4	15
08:45 AM	0	2	3	0	5	2	0	0	3	5	0	0	0	0	0	0	0	0	0	0	10
Total	0	9	8	0	17	15	4	0	3	22	0	0	0	0	0	8	0	8	0	16	55
*** BREAK ***																					
11:00 AM	0	0	0	0	0	6	5	0	0	11	0	0	0	0	0	1	0	2	0	3	14
11:15 AM	0	4	1	0	5	5	6	0	0	11	0	0	0	0	0	0	0	5	0	5	21
11:30 AM	0	5	1	0	6	6	1	0	0	7	0	0	0	0	0	1	0	9	0	10	23
11:45 AM	0	5	0	0	5	7	1	0	0	8	0	0	0	0	0	1	0	3	0	4	17
Total	0	14	2	0	16	24	13	0	0	37	0	0	0	0	0	3	0	19	0	22	75
12:00 PM	0	2	1	0	3	5	4	0	0	9	0	0	0	0	0	1	0	12	0	13	25
12:15 PM	0	2	1	0	3	4	3	0	0	7	0	0	0	0	0	0	0	6	0	6	16
12:30 PM	0	0	1	0	1	8	2	0	0	10	0	0	0	0	0	2	0	6	0	8	19
12:45 PM	0	4	0	0	4	5	3	0	0	8	0	0	0	0	0	2	0	5	0	7	19
Total	0	8	3	0	11	22	12	0	0	34	0	0	0	0	0	5	0	29	0	34	79
*** BREAK ***																					
02:30 PM	0	3	2	1	6	5	3	0	0	8	0	0	0	0	0	3	0	7	0	10	24
02:45 PM	0	2	1	0	3	4	2	0	0	6	0	0	0	0	0	1	0	7	0	8	17
Total	0	5	3	1	9	9	5	0	0	14	0	0	0	0	0	4	0	14	0	18	41
03:00 PM	0	5	1	0	6	3	3	0	0	6	0	0	0	0	0	6	0	5	0	11	23
03:15 PM	0	2	1	0	3	1	4	0	0	5	0	0	0	0	0	2	0	5	0	7	15
03:30 PM	0	3	1	0	4	5	7	0	0	12	0	0	0	0	0	4	0	18	0	22	38
03:45 PM	0	5	0	1	6	5	4	0	0	9	0	0	0	0	0	4	0	9	0	13	28
Total	0	15	3	1	19	14	18	0	0	32	0	0	0	0	0	16	0	37	0	53	104
04:00 PM	0	6	1	0	7	4	2	0	0	6	0	0	0	0	0	0	0	3	0	3	16
04:15 PM	0	7	1	0	8	4	10	0	0	14	0	0	0	0	0	1	0	3	0	4	26
04:30 PM	0	4	1	0	5	2	5	0	0	7	0	0	0	0	0	2	0	14	0	16	28
04:45 PM	0	6	2	0	8	0	1	0	0	1	0	0	0	0	0	4	0	3	0	7	16
Total	0	23	5	0	28	10	18	0	0	28	0	0	0	0	0	7	0	23	0	30	86
05:00 PM	0	4	1	0	5	4	0	0	0	4	0	0	0	1	1	1	0	7	0	8	18
05:15 PM	0	3	1	0	4	8	6	0	2	16	0	0	0	0	0	3	0	11	0	14	34
05:30 PM	0	1	1	0	2	2	8	0	0	10	0	0	0	0	0	10	0	4	0	14	26
05:45 PM	0	6	4	2	12	4	3	0	0	7	0	0	0	1	1	3	0	6	0	9	29
Total	0	14	7	2	23	18	17	0	2	37	0	0	0	2	2	17	0	28	0	45	107
Grand Total	0	94	40	4	138	135	97	0	5	237	0	0	0	3	3	62	0	169	1	232	610
Apprch %	0	68.1	29	2.9		57	40.9	0	2.1		0	0	0	100		26.7	0	72.8	0.4		
Total %	0	15.4	6.6	0.7	22.6	22.1	15.9	0	0.8	38.9	0	0	0	0.5	0.5	10.2	0	27.7	0.2	38	
Cars	0	91	40	4	135	135	97	0	5	237	0	0	0	3	3	60	0	168	1	229	604
% Cars	0	96.8	100	100	97.8	100	100	0	100	100	0	0	0	100	100	96.8	0	99.4	100	98.7	99
Trucks	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	6
% Trucks	0	3.2	0	0	2.2	0	0	0	0	0	0	0	0	0	0	3.2	0	0.6	0	1.3	1

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: Light rain last 10 minutes of
Incidents: Police called to investigate

File Name : 1001 McWain & Pollock 07-23-2015
Site Code : 10010004
Start Date : 07-23-2015

	McWain Road Northbound					McWain Road Southbound					Eastbound					Pollock Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	2	0	2	9	1	0	0	10	0	0	0	1	1	1	0	9	1	11	24
07:45 AM	0	1	3	0	4	4	4	0	0	8	0	0	0	0	0	0	0	0	0	0	12
08:00 AM	0	1	1	0	2	2	1	0	0	3	0	0	0	0	0	2	0	3	0	5	10
08:15 AM	0	3	2	0	5	7	1	0	0	8	0	0	0	0	0	3	0	4	0	7	20
Total Volume	0	5	8	0	13	22	7	0	0	29	0	0	0	1	1	6	0	16	1	23	66
% App. Total	0	38.5	61.5	0		75.9	24.1	0	0		0	0	0	100		26.1	0	69.6	4.3		
PHF	.000	.417	.667	.000	.650	.611	.438	.000	.000	.725	.000	.000	.000	.250	.250	.500	.000	.444	.250	.523	.688
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:15 AM																					
11:15 AM	0	4	1	0	5	5	6	0	0	11	0	0	0	0	0	0	0	5	0	5	21
11:30 AM	0	5	1	0	6	6	1	0	0	7	0	0	0	0	0	1	0	9	0	10	23
11:45 AM	0	5	0	0	5	7	1	0	0	8	0	0	0	0	0	1	0	3	0	4	17
12:00 PM	0	2	1	0	3	5	4	0	0	9	0	0	0	0	0	1	0	12	0	13	25
Total Volume																					
% App. Total	0	84.2	15.8	0		65.7	34.3	0	0		0	0	0	0		9.4	0	90.6	0		
PHF	.000	.800	.750	.000	.792	.821	.500	.000	.000	.795	.000	.000	.000	.000	.000	.750	.000	.604	.000	.615	.860
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	0	3	1	0	4	5	7	0	0	12	0	0	0	0	0	4	0	18	0	22	38
03:45 PM	0	5	0	1	6	5	4	0	0	9	0	0	0	0	0	4	0	9	0	13	28
04:00 PM	0	6	1	0	7	4	2	0	0	6	0	0	0	0	0	0	0	3	0	3	16
04:15 PM	0	7	1	0	8	4	10	0	0	14	0	0	0	0	0	1	0	3	0	4	26
Total Volume	0	21	3	1	25	18	23	0	0	41	0	0	0	0	0	9	0	33	0	42	108
% App. Total	0	84	12	4		43.9	56.1	0	0		0	0	0	0		21.4	0	78.6	0		
PHF	.000	.750	.750	.250	.781	.900	.575	.000	.000	.732	.000	.000	.000	.000	.000	.563	.000	.458	.000	.477	.711

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: Kraft Engineering - MSP
Comments: None
Incidents: None

File Name : 1002 Baldwin & McWain 07-08-2015
Site Code : 10020001
Start Date : 07-08-2015
Page No : 1

Groups Printed- Cars - Trucks

	McWain Road Northbound					McWain Road Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	1	0	0	1	1	0	3	0	4	0	94	0	0	94	0	45	0	0	45	144
07:15 AM	0	1	0	0	1	1	0	2	0	3	2	121	0	0	123	0	47	3	0	50	177
07:30 AM	1	0	2	0	3	0	0	2	0	2	1	96	0	0	97	0	88	0	0	88	190
07:45 AM	1	1	2	0	4	1	0	1	1	3	2	142	0	1	145	0	82	1	0	83	235
Total	2	3	4	0	9	3	0	8	1	12	5	453	0	1	459	0	262	4	0	266	746
08:00 AM	0	0	0	1	1	0	0	3	0	3	1	110	0	0	111	1	53	0	0	54	169
08:15 AM	1	0	2	0	3	1	0	0	2	3	0	124	0	0	124	0	60	0	0	60	190
08:30 AM	0	1	0	0	1	1	0	1	0	2	2	117	0	0	119	1	39	1	0	41	163
08:45 AM	0	1	3	0	4	0	2	0	0	2	1	97	0	1	99	0	57	1	0	58	163
Total	1	2	5	1	9	2	2	4	2	10	4	448	0	1	453	2	209	2	0	213	685
*** BREAK ***																					
11:00 AM	2	2	2	0	6	0	2	2	0	4	3	50	0	0	53	0	76	1	0	77	140
11:15 AM	0	0	0	0	0	1	0	0	0	1	0	83	0	0	83	0	60	0	0	60	144
11:30 AM	0	1	2	0	3	2	0	1	0	3	2	58	0	0	60	0	56	1	0	57	123
11:45 AM	1	0	0	0	1	1	1	2	1	5	3	66	0	1	70	1	82	0	0	83	159
Total	3	3	4	0	10	4	3	5	1	13	8	257	0	1	266	1	274	2	0	277	566
12:00 PM	1	1	0	0	2	0	1	1	0	2	0	59	8	0	67	0	81	2	0	83	154
12:15 PM	0	3	0	0	3	1	1	2	0	4	0	60	2	0	62	0	62	1	0	63	132
12:30 PM	3	0	1	0	4	1	0	1	0	2	1	65	1	0	67	0	81	4	0	85	158
12:45 PM	0	0	3	0	3	0	0	2	0	2	2	88	2	0	92	0	66	1	0	67	164
Total	4	4	4	0	12	2	2	6	0	10	3	272	13	0	288	0	290	8	0	298	608
*** BREAK ***																					
04:00 PM	1	1	0	0	2	1	1	2	0	4	1	87	1	0	89	1	142	1	0	144	239
04:15 PM	0	0	1	0	1	0	1	2	0	3	3	86	0	0	89	2	109	0	0	111	204
04:30 PM	1	1	1	0	3	3	2	4	1	10	1	82	1	0	84	2	155	0	0	157	254
04:45 PM	0	0	1	0	1	0	2	4	0	6	5	89	0	0	94	0	113	2	0	115	216
Total	2	2	3	0	7	4	6	12	1	23	10	344	2	0	356	5	519	3	0	527	913
05:00 PM	0	2	1	0	3	1	0	3	0	4	4	79	3	0	86	4	182	1	0	187	280
05:15 PM	0	1	2	0	3	0	1	2	0	3	3	89	0	0	92	4	136	1	0	141	239
05:30 PM	2	1	7	0	10	0	1	3	1	5	7	75	0	0	82	1	131	1	0	133	230
Grand Total	14	18	30	1	63	16	15	43	6	80	44	2017	18	3	2082	17	2003	22	0	2042	4267
Apprch %	22.2	28.6	47.6	1.6		20	18.8	53.8	7.5		2.1	96.9	0.9	0.1		0.8	98.1	1.1	0		
Total %	0.3	0.4	0.7	0	1.5	0.4	0.4	1	0.1	1.9	1	47.3	0.4	0.1	48.8	0.4	46.9	0.5	0	47.9	
Cars	14	18	29	1	62	16	15	41	6	78	44	1967					1947				
% Cars	100	100	96.7	100	98.4	100	100	95.3	100	97.5	100	97.5	100	100	97.6	100	97.2	100	0	97.3	97.4
Trucks	0	0	1	0	1	0	0	2	0	2	0	50	0	0	50	0	56	0	0	56	109
% Trucks	0	0	3.3	0	1.6	0	0	4.7	0	2.5	0	2.5	0	0	2.4	0	2.8	0	0	2.7	2.6

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny - Cool
Collected By: RR
Comments: Holly Road
Incidents: None

File Name : 1003 Holly & Baldwin AM Midday 08-12-2015
Site Code : 11030002
Start Date : 08-12-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	3	52	7	0	62	29	90	9	0	128	23	32	14	0	69	19	15	45	0	79	338
06:45 AM	1	54	6	0	61	46	83	23	0	152	26	36	10	0	72	11	27	52	0	90	375
Total	4	106	13	0	123	75	173	32	0	280	49	68	24	0	141	30	42	97	0	169	713
07:00 AM	12	75	6	0	93	35	51	8	0	94	31	28	9	0	68	12	18	38	3	71	326
07:15 AM	7	65	6	0	78	26	43	14	0	83	48	29	8	0	85	7	27	41	0	75	321
07:30 AM	11	98	5	0	114	36	78	18	0	132	45	42	8	0	95	12	35	42	0	89	430
07:45 AM	4	64	8	0	76	34	74	21	0	129	55	53	16	0	124	12	27	45	0	84	413
Total	34	302	25	0	361	131	246	61	0	438	179	152	41	0	372	43	107	166	3	319	1490
08:00 AM	7	62	10	0	79	30	42	16	0	88	51	40	14	0	105	8	35	51	0	94	366
08:15 AM	3	53	1	0	57	27	52	20	0	99	48	35	8	0	91	3	46	58	0	107	354
08:30 AM	2	55	4	0	61	31	45	21	0	97	43	27	11	0	81	10	33	44	0	87	326
08:45 AM	4	72	8	0	84	34	37	23	0	94	39	38	5	0	82	7	34	66	0	107	367
Total	16	242	23	0	281	122	176	80	0	378	181	140	38	0	359	28	148	219	0	395	1413
*** BREAK ***																					
11:00 AM	7	41	9	0	57	32	43	29	0	104	28	16	5	0	49	8	30	39	0	77	287
11:15 AM	7	68	6	0	81	42	61	22	0	125	28	32	5	0	65	10	29	43	0	82	353
11:30 AM	10	55	9	0	74	41	54	20	0	115	19	30	12	0	61	9	30	41	0	80	330
11:45 AM	12	76	15	0	103	40	53	26	0	119	36	28	3	0	67	8	34	55	0	97	386
Total	36	240	39	0	315	155	211	97	0	463	111	106	25	0	242	35	123	178	0	336	1356
12:00 PM	9	78	11	0	98	54	66	17	0	137	34	20	8	0	62	12	28	69	0	109	406
12:15 PM	8	77	9	0	94	45	44	34	0	123	32	28	6	0	66	3	27	44	0	74	357
12:30 PM	6	57	6	0	69	51	70	23	0	144	22	29	7	0	58	14	32	45	0	91	362
12:45 PM	5	49	10	0	64	38	58	12	0	108	24	35	6	0	65	12	42	50	0	104	341
Total	28	261	36	0	325	188	238	86	0	512	112	112	27	0	251	41	129	208	0	378	1466
Grand Total	118	1151	136	0	1405	671	1044	356	0	2071	632	578	155	0	1365	177	549	868	3	1597	6438
Apprch %	8.4	81.9	9.7	0		32.4	50.4	17.2	0		46.3	42.3	11.4	0		11.1	34.4	54.4	0.2		
Total %	1.8	17.9	2.1	0	21.8	10.4	16.2	5.5	0	32.2	9.8	9	2.4	0	21.2	2.7	8.5	13.5	0	24.8	
Cars	115	1119	127	0	1361	635	996	350	0	1981	620	564	143	0	1327	165	527	823	3	1518	6187
% Cars	97.5	97.2	93.4	0	96.9	94.6	95.4	98.3	0	95.7	98.1	97.6	92.3	0	97.2	93.2	96	94.8	100	95.1	96.1
Trucks	3	32	9	0	44	36	48	6	0	90	12	14	12	0	38	12	22	45	0	79	251
% Trucks	2.5	2.8	6.6	0	3.1	5.4	4.6	1.7	0	4.3	1.9	2.4	7.7	0	2.8	6.8	4	5.2	0	4.9	3.9

	Holly Road Northbound					Holly Road Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	11	98	5	0	114	36	78	18	0	132	45	42	8	0	95	12	35	42	0	89	430
07:45 AM	4	64	8	0	76	34	74	21	0	129	55	53	16	0	124	12	27	45	0	84	413
08:00 AM	7	62	10	0	79	30	42	16	0	88	51	40	14	0	105	8	35	51	0	94	366
08:15 AM	3	53	1	0	57	27	52	20	0	99	48	35	8	0	91	3	46	58	0	107	354
Total Volume	25	277	24	0	326	127	246	75	0	448	199	170	46	0	415	35	143	196	0	374	1563
% App. Total	7.7	85	7.4	0		28.3	54.9	16.7	0		48	41	11.1	0		9.4	38.2	52.4	0		
PHF	.568	.707	.600	.000	.715	.882	.788	.893	.000	.848	.905	.802	.719	.000	.837	.729	.777	.845	.000	.874	.909

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny - Cool
Collected By: RR
Comments: Holly Road
Incidents: None

File Name : 1003 Holly & Baldwin AM Midday 08-12-2015
Site Code : 11030002
Start Date : 08-12-2015
Page No : 2

	Holly Road Northbound					Holly Road Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	12	76	15	0	103	40	53	26	0	119	36	28	3	0	67	8	34	55	0	97	386
12:00 PM	9	78	11	0	98	54	66	17	0	137	34	20	8	0	62	12	28	69	0	109	406
12:15 PM	8	77	9	0	94	45	44	34	0	123	32	28	6	0	66	3	27	44	0	74	357
12:30 PM	6	57	6	0	69	51	70	23	0	144	22	29	7	0	58	14	32	45	0	91	362
Total Volume	35	288	41	0	364	190	233	100	0	523	124	105	24	0	253	37	121	213	0	371	1511
% App. Total	9.6	79.1	11.3	0		36.3	44.6	19.1	0		49	41.5	9.5	0		10	32.6	57.4	0		
PHF	.729	.923	.683	.000	.883	.880	.832	.735	.000	.908	.861	.905	.750	.000	.944	.661	.890	.772	.000	.851	.930

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: Holly Rd, counted from video
Incidents: None

File Name : 1003 Holly & Baldwin PM Revised 07-21-2015
Site Code : 11030004
Start Date : 07-21-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:30 PM	6	63	8	0	77	56	104	15	0	175	31	28	12	0	71	6	42	74	0	122	445
02:45 PM	4	49	7	0	60	46	78	42	0	166	26	32	13	0	71	12	35	53	0	100	397
Total	10	112	15	0	137	102	182	57	0	341	57	60	25	0	142	18	77	127	0	222	842
03:00 PM	23	104	15	0	142	32	68	28	0	128	52	32	5	0	89	3	50	53	0	106	465
03:15 PM	8	73	12	0	93	46	95	35	0	176	30	31	9	0	70	16	44	43	0	103	442
03:30 PM	22	58	18	0	98	45	58	36	0	139	28	35	8	0	71	11	52	45	0	108	416
03:45 PM	16	74	8	0	98	71	85	47	0	203	31	44	12	0	87	16	49	37	0	102	490
Total	69	309	53	0	431	194	306	146	0	646	141	142	34	0	317	46	195	178	0	419	1813
04:00 PM	19	63	13	0	95	37	52	46	0	135	30	46	14	0	90	11	62	65	0	138	458
04:15 PM	16	58	7	0	81	56	75	40	0	171	38	31	9	0	78	4	59	39	0	102	432
04:30 PM	10	68	15	0	93	77	74	28	0	179	39	49	15	0	103	21	77	77	0	175	550
04:45 PM	16	52	9	0	77	64	89	23	0	176	36	51	10	0	97	9	60	37	0	106	456
Total	61	241	44	0	346	234	290	137	0	661	143	177	48	0	368	45	258	218	0	521	1896
05:00 PM	24	100	19	0	143	60	95	45	0	200	29	56	11	0	96	13	83	55	0	151	590
05:15 PM	13	83	18	1	115	67	69	54	0	190	37	51	8	0	96	15	48	38	0	101	502
05:30 PM	13	80	19	0	112	55	77	40	0	172	42	61	8	0	111	17	64	38	0	119	514
05:45 PM	14	54	10	0	78	53	75	43	0	171	46	37	8	0	91	9	55	42	0	106	446
Total	64	317	66	1	448	235	316	182	0	733	154	205	35	0	394	54	250	173	0	477	2052
Grand Total	204	979	178	1	1362	765	1094	522	0	2381	495	584	142	0	1221	163	780	696	0	1639	6603
Apprch %	15	71.9	13.1	0.1		32.1	45.9	21.9	0		40.5	47.8	11.6	0		9.9	47.6	42.5	0		
Total %	3.1	14.8	2.7	0	20.6	11.6	16.6	7.9	0	36.1	7.5	8.8	2.2	0	18.5	2.5	11.8	10.5	0	24.8	
Cars	192	968	174	1	1335	749	1073														
% Cars	94.1	98.9	97.8	100	98	97.9	98.1	97.7	0	97.9	99.4	97.4	95.1	0	98	94.5	97.9	96	0	96.8	97.7
Trucks	12	11	4	0	27	16	21	12	0	49	3	15	7	0	25	9	16	28	0	53	154
% Trucks	5.9	1.1	2.2	0	2	2.1	1.9	2.3	0	2.1	0.6	2.6	4.9	0	2	5.5	2.1	4	0	3.2	2.3

	Holly Road Northbound					Holly Road Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total		Thru	Right	Peds	App. Total		Thru	Right	Peds	App. Total		Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	10	68	15	0	93	77	74	28	0	179	39	49	15	0	103	21	77	77	0	175	550
04:45 PM	16	52	9	0	77	64	89	23	0	176	36	51	10	0	97	9	60	37	0	106	456
05:00 PM	24	100	19	0	143	60	95	45	0	200	29	56	11	0	96	13	83	55	0	151	590
05:15 PM	13	83	18	1	115	67	69	54	0	190	37	51	8	0	96	15	48	38	0	101	502
Total Volume	63	303	61	1	428	268	327	150	0	745	141	207	44	0	392	58	268	207	0	533	2098
% App. Total	14.7	70.8	14.3	0.2		36	43.9	20.1	0		36	52.8	11.2	0		10.9	50.3	38.8	0		
PHF	.656	.758	.803	.250	.748	.870	.861	.694	.000	.931	.904	.924	.733	.000	.951	.690	.807	.672	.000	.761	.889

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: None
Incidents: None

File Name : 1004 Holly & Pollock 07-21-2015
Site Code : 10040001
Start Date : 07-21-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					Pollock Road Eastbound					BP Station Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	2	122	9	0	133	20	212	100	0	332	3	0	1	0	4	7	1	23	0	31	500
06:45 AM	0	135	1	0	136	26	249	123	0	398	1	0	0	0	1	4	0	31	0	35	570
Total	2	257	10	0	269	46	461	223	0	730	4	0	1	0	5	11	1	54	0	66	1070
07:00 AM	0	180	13	0	193	16	104	60	0	180	1	0	0	0	1	4	1	27	0	32	406
07:15 AM	4	177	12	0	193	20	135	55	0	210	2	0	1	0	3	8	0	32	0	40	446
07:30 AM	3	255	8	0	266	29	180	59	0	268	2	0	0	0	2	8	1	24	0	33	569
07:45 AM	1	199	9	0	209	15	202	79	0	296	11	0	3	0	14	4	0	31	0	35	554
Total	8	811	42	0	861	80	621	253	0	954	16	0	4	0	20	24	2	114	0	140	1975
08:00 AM	1	154	14	0	169	15	127	59	0	201	3	1	2	0	6	5	1	26	0	32	408
08:15 AM	2	158	13	0	173	20	146	43	0	209	4	0	2	0	6	6	1	27	0	34	422
08:30 AM	3	151	10	0	164	19	157	35	0	211	9	0	3	0	12	10	2	32	0	44	431
08:45 AM	9	148	3	0	160	24	169	47	0	240	8	0	4	0	12	8	0	29	0	37	449
Total	15	611	40	0	666	78	599	184	0	861	24	1	11	0	36	29	4	114	0	147	1710
*** BREAK ***																					
11:00 AM	7	177	15	0	199	28	151	23	0	202	11	0	4	0	15	6	0	20	0	26	442
11:15 AM	2	161	9	0	172	14	132	23	0	169	12	4	5	0	21	4	1	27	0	32	394
11:30 AM	8	174	12	0	194	15	148	27	0	190	7	1	8	0	16	8	1	17	0	26	426
11:45 AM	10	188	16	0	214	15	168	31	0	214	15	0	4	0	19	4	0	25	0	29	476
Total	27	700	52	0	779	72	599	104	0	775	45	5	21	0	71	22	2	89	0	113	1738
12:00 PM	10	217	28	0	255	17	149	27	0	193	13	1	7	0	21	15	1	23	0	39	508
12:15 PM	13	190	7	0	210	17	183	30	0	230	15	1	5	0	21	10	1	35	0	46	507
12:30 PM	3	166	10	0	179	19	162	33	0	214	18	2	5	0	25	5	1	22	0	28	446
12:45 PM	4	187	14	0	205	16	158	26	0	200	12	0	5	0	17	12	1	24	0	37	459
Total	30	760	59	0	849	69	652	116	0	837	58	4	22	0	84	42	4	104	0	150	1920
*** BREAK ***																					
02:30 PM	1	253	12	0	266	20	217	39	0	276	14	1	9	0	24	8	0	13	0	21	587
02:45 PM	3	222	12	0	237	10	209	47	0	266	15	1	10	0	26	13	1	28	0	42	571
Total	4	475	24	0	503	30	426	86	0	542	29	2	19	0	50	21	1	41	0	63	1158
03:00 PM	3	301	10	0	314	12	153	20	0	185	10	2	3	0	15	7	0	19	0	26	540
03:15 PM	2	237	8	0	247	16	186	16	0	218	8	1	2	0	11	10	0	17	0	27	503
03:30 PM	2	272	6	0	280	10	174	28	0	212	23	1	10	0	34	2	0	16	0	18	544
03:45 PM	2	280	7	0	289	21	193	11	0	225	10	0	8	0	18	10	0	22	0	32	564
Total	9	1090	31	0	1130	59	706	75	0	840	51	4	23	0	78	29	0	74	0	103	2151
04:00 PM	0	263	6	0	269	16	169	21	0	206	10	1	3	0	14	3	0	17	0	20	509
04:15 PM	5	216	8	0	229	12	193	19	0	224	11	0	5	0	16	5	0	26	0	31	500
04:30 PM	2	316	10	0	328	20	178	13	0	211	9	1	3	0	13	3	0	17	0	20	572
04:45 PM	2	230	5	0	237	17	215	23	0	255	10	0	1	0	11	5	1	28	0	34	537
Total	9	1025	29	0	1063	65	755	76	0	896	40	2	12	0	54	16	1	88	0	105	2118
05:00 PM	0	288	8	0	296	18	204	16	0	238	10	0	1	0	11	4	0	24	0	28	573
05:15 PM	0	213	6	0	219	20	195	13	0	228	11	1	3	0	15	6	1	16	0	23	485
05:30 PM	1	218	8	0	227	10	197	22	0	229	9	1	4	0	14	2	0	26	0	28	498
05:45 PM	4	197	5	0	206	16	203	25	0	244	8	0	3	0	11	2	0	12	0	14	475
Total	5	916	27	0	948	64	799	76	0	939	38	2	11	0	51	14	1	78	0	93	2031
Grand Total	109	6645	314	0	7068	563	5618	1193	0	7374	305	20	124	0	449	208	16	756	0	980	15871
Apprch %	1.5	94	4.4	0		7.6	76.2	16.2	0		67.9	4.5	27.6	0		21.2	1.6	77.1	0		
Total %	0.7	41.9	2	0	44.5	3.5	35.4	7.5	0	46.5	1.9	0.1	0.8	0	2.8	1.3	0.1	4.8	0	6.2	
Cars	108	6476					5458	1170													15475
% Cars	99.1	97.5	97.8	0	97.5	98.2	97.2	98.1	0	97.4	98.4	100	97.6	0	98.2	98.6	100	98	0	98.2	97.5
Trucks	1	169	7	0	177	10	160	23	0	193	5	0	3	0	8	3	0	15	0	18	396
% Trucks	0.9	2.5	2.2	0	2.5	1.8	2.8	1.9	0	2.6	1.6	0	2.4	0	1.8	1.4	0	2	0	1.8	2.5

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Holly Road Northbound					Holly Road Southbound					Pollock Road Eastbound					BP Station Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	0	135	1	0	136	26	249	123	0	398	1	0	0	0	1	4	0	31	0	35	570
07:00 AM	0	180	13	0	193	16	104	60	0	180	1	0	0	0	1	4	1	27	0	32	406
07:15 AM	4	177	12	0	193	20	135	55	0	210	2	0	1	0	3	8	0	32	0	40	446
07:30 AM	3	255	8	0	266	29	180	59	0	268	2	0	0	0	2	8	1	24	0	33	569
Total Volume	7	747	34	0	788	91	668	297	0	1056	6	0	1	0	7	24	2	114	0	140	1991
% App. Total	0.9	94.8	4.3	0		8.6	63.3	28.1	0		85.7	0	14.3	0		17.1	1.4	81.4	0		
PHF	.438	.732	.654	.000	.741	.784	.671	.604	.000	.663	.750	.000	.250	.000	.583	.750	.500	.891	.000	.875	.873
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	10	188	16	0	214	15	168	31	0	214	15	0	4	0	19	4	0	25	0	29	476
12:00 PM	10	217	28	0	255	17	149	27	0	193	13	1	7	0	21	15	1	23	0	39	508
12:15 PM	13	190	7	0	210	17	183	30	0	230	15	1	5	0	21	10	1	35	0	46	507
12:30 PM	3	166	10	0	179	19	162	33	0	214	18	2	5	0	25	5	1	22	0	28	446
Total Volume																					
% App. Total	4.2	88.7	7.1	0		8	77.8	14.2	0		70.9	4.7	24.4	0		23.9	2.1	73.9	0		
PHF	.692	.877	.545	.000	.841	.895	.904	.917	.000	.925	.847	.500	.750	.000	.860	.567	.750	.750	.000	.772	.953
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:30 PM																					
02:30 PM	1	253	12	0	266	20	217	39	0	276	14	1	9	0	24	8	0	13	0	21	587
02:45 PM	3	222	12	0	237	10	209	47	0	266	15	1	10	0	26	13	1	28	0	42	571
03:00 PM	3	301	10	0	314	12	153	20	0	185	10	2	3	0	15	7	0	19	0	26	540
03:15 PM	2	237	8	0	247	16	186	16	0	218	8	1	2	0	11	10	0	17	0	27	503
Total Volume	9	1013	42	0	1064	58	765	122	0	945	47	5	24	0	76	38	1	77	0	116	2201
% App. Total	0.8	95.2	3.9	0		6.1	81	12.9	0		61.8	6.6	31.6	0		32.8	0.9	66.4	0		
PHF	.750	.841	.875	.000	.847	.725	.881	.649	.000	.856	.783	.625	.600	.000	.731	.731	.250	.688	.000	.690	.937

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: No pedestrians, one indicated
Incidents: None

File Name : 1005 Holly & Genesys 07-22-2015
Site Code : 10050001
Start Date : 07-22-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					Genesys Parkway Eastbound					Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	5	122	0	0	127	0	180	57	0	237	19	0	1	0	20	0	0	0	0	0	384
06:45 AM	5	112	0	0	117	0	201	87	0	288	35	0	0	0	35	0	0	0	0	0	440
Total	10	234	0	0	244	0	381	144	0	525	54	0	1	0	55	0	0	0	0	0	824
07:00 AM	6	173	0	0	179	0	71	29	0	100	33	0	0	0	33	0	0	0	0	0	312
07:15 AM	0	146	0	0	146	0	111	43	0	154	17	0	0	0	17	0	0	0	0	0	317
07:30 AM	2	166	0	0	168	0	117	48	0	165	113	0	2	0	115	0	0	0	0	0	448
07:45 AM	3	130	0	0	133	0	167	60	0	227	38	0	4	0	42	0	0	0	0	0	402
Total	11	615	0	0	626	0	466	180	0	646	201	0	6	0	207	0	0	0	0	0	1479
08:00 AM	4	129	0	0	133	0	98	37	0	135	53	0	1	0	54	0	0	0	0	0	322
08:15 AM	4	138	0	0	142	0	106	46	0	152	42	0	3	0	45	0	0	0	0	0	339
08:30 AM	1	144	0	0	145	0	100	51	0	151	31	0	5	0	36	0	0	0	0	0	332
08:45 AM	4	155	0	0	159	0	99	86	0	185	39	0	2	0	41	0	0	0	0	0	385
Total	13	566	0	0	579	0	403	220	0	623	165	0	11	0	176	0	0	0	0	0	1378
*** BREAK ***																					
11:00 AM	5	124	0	0	129	0	92	36	0	128	54	0	2	0	56	0	0	0	0	0	313
11:15 AM	7	149	0	0	156	0	102	37	0	139	74	0	4	0	78	0	0	0	0	0	373
11:30 AM	1	157	0	0	158	0	132	30	0	162	71	0	2	0	73	0	0	0	0	0	393
11:45 AM	8	126	0	0	134	0	127	42	0	169	76	0	1	0	77	0	0	0	0	0	380
Total	21	556	0	0	577	0	453	145	0	598	275	0	9	0	284	0	0	0	0	0	1459
12:00 PM	14	144	0	0	158	0	145	28	0	173	96	0	5	0	101	0	0	0	0	0	432
12:15 PM	1	195	0	0	196	0	149	41	0	190	78	0	3	0	81	0	0	0	0	0	467
12:30 PM	3	144	0	0	147	0	125	39	0	164	70	0	4	0	74	0	0	0	0	0	385
12:45 PM	6	124	0	0	130	0	144	43	0	187	59	0	2	0	61	0	0	0	0	0	378
Total	24	607	0	0	631	0	563	151	0	714	303	0	14	0	317	0	0	0	0	0	1662
*** BREAK ***																					
02:30 PM	7	153	0	0	160	0	199	45	0	244	121	0	5	0	126	0	0	0	0	0	530
02:45 PM	7	121	0	0	128	0	177	38	0	215	81	0	4	0	85	0	0	0	0	0	428
Total	14	274	0	0	288	0	376	83	0	459	202	0	9	0	211	0	0	0	0	0	958
03:00 PM	3	251	0	0	254	0	140	26	0	166	103	0	3	0	106	0	0	0	0	0	526
03:15 PM	3	147	0	0	150	0	183	34	0	217	87	0	5	0	92	0	0	0	0	0	459
03:30 PM	5	183	0	0	188	0	140	41	0	181	162	0	0	0	162	0	0	0	0	0	531
03:45 PM	0	200	0	0	200	0	153	39	0	192	125	0	4	0	129	0	0	0	0	0	521
Total	11	781	0	0	792	0	616	140	0	756	477	0	12	0	489	0	0	0	0	0	2037
04:00 PM	2	165	0	0	167	0	146	27	0	173	104	0	5	0	109	1	0	0	0	1	450
04:15 PM	3	130	0	0	133	0	186	30	0	216	83	0	1	0	84	0	0	0	0	0	433
04:30 PM	3	253	0	0	256	0	180	38	0	218	137	0	6	0	143	0	0	0	0	0	617
04:45 PM	1	156	0	0	157	0	183	23	0	206	111	0	8	0	119	0	0	0	0	0	482
Total	9	704	0	0	713	0	695	118	0	813	435	0	20	0	455	1	0	0	0	1	1982
05:00 PM	0	199	0	0	199	0	188	50	0	238	141	0	3	0	144	0	0	0	0	0	581
05:15 PM	3	173	0	0	176	0	195	37	0	232	66	0	6	0	72	0	0	0	0	0	480
05:30 PM	2	136	0	0	138	0	161	30	0	191	72	0	1	0	73	0	0	0	0	0	402
05:45 PM	2	159	0	0	161	0	176	30	0	206	53	0	6	0	59	0	0	0	0	0	426
Total	7	667	0	0	674	0	720	147	0	867	332	0	16	0	348	0	0	0	0	0	1889
Grand Total	120	5004	0	0	5124	0	4673	1328	0	6001	2444	0	98	0	2542	1	0	0	0	1	13668
Apprch %	2.3	97.7	0	0		0	77.9	22.1	0		96.1	0	3.9	0		100	0	0	0		
Total %	0.9	36.6	0	0	37.5	0	34.2	9.7	0	43.9	17.9	0	0.7	0	18.6	0	0	0	0	0	
Cars	118	4827					4512	1316			2417										13288
% Cars	98.3	96.5	0	0	96.5	0	96.6	99.1	0	97.1	98.9	0	99	0	98.9	100	0	0	0	100	97.2
Trucks	2	177	0	0	179	0	161	12	0	173	27	0	1	0	28	0	0	0	0	0	380
% Trucks	1.7	3.5	0	0	3.5	0	3.4	0.9	0	2.9	1.1	0	1	0	1.1	0	0	0	0	0	2.8

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Holly Road Northbound					Holly Road Southbound					Genesys Parkway Eastbound					Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	5	112	0	0	117	0	201	87	0	288	35	0	0	0	35	0	0	0	0	0	440
07:00 AM	6	173	0	0	179	0	71	29	0	100	33	0	0	0	33	0	0	0	0	0	312
07:15 AM	0	146	0	0	146	0	111	43	0	154	17	0	0	0	17	0	0	0	0	0	317
07:30 AM	2	166	0	0	168	0	117	48	0	165	113	0	2	0	115	0	0	0	0	0	448
Total Volume	13	597	0	0	610	0	500	207	0	707	198	0	2	0	200	0	0	0	0	0	1517
% App. Total	2.1	97.9	0	0		0	70.7	29.3	0		99	0	1	0		0	0	0	0		
PHF	.542	.863	.000	.000	.852	.000	.622	.595	.000	.614	.438	.000	.250	.000	.435	.000	.000	.000	.000	.000	.847
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	1	157	0	0	158	0	132	30	0	162	71	0	2	0	73	0	0	0	0	0	393
11:45 AM	8	126	0	0	134	0	127	42	0	169	76	0	1	0	77	0	0	0	0	0	380
12:00 PM	14	144	0	0	158	0	145	28	0	173	96	0	5	0	101	0	0	0	0	0	432
12:15 PM	1	195	0	0	196	0	149	41	0	190	78	0	3	0	81	0	0	0	0	0	467
Total Volume																					
% App. Total	3.7	96.3	0	0		0	79.7	20.3	0		96.7	0	3.3	0		0	0	0	0		
PHF	.429	.797	.000	.000	.824	.000	.928	.839	.000	.913	.836	.000	.550	.000	.822	.000	.000	.000	.000	.000	.895
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	3	253	0	0	256	0	180	38	0	218	137	0	6	0	143	0	0	0	0	0	617
04:45 PM	1	156	0	0	157	0	183	23	0	206	111	0	8	0	119	0	0	0	0	0	482
05:00 PM	0	199	0	0	199	0	188	50	0	238	141	0	3	0	144	0	0	0	0	0	581
05:15 PM	3	173	0	0	176	0	195	37	0	232	66	0	6	0	72	0	0	0	0	0	480
Total Volume	7	781	0	0	788	0	746	148	0	894	455	0	23	0	478	0	0	0	0	0	2160
% App. Total	0.9	99.1	0	0		0	83.4	16.6	0		95.2	0	4.8	0		0	0	0	0		
PHF	.583	.772	.000	.000	.770	.000	.956	.740	.000	.939	.807	.000	.719	.000	.830	.000	.000	.000	.000	.000	.875

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Overcast
Collected By: Kraft Engineering - MSP
Comments: None
Incidents: None

File Name : 1006 Holly & Woodridge 07-09-2015
Site Code : 01006001
Start Date : 07-09-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					Woodbridge Boulevard Eastbound					Private Parking Lot Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	11	149	0	0	160	1	68	6	0	75	9	0	5	0	14	0	0	0	0	0	249
07:15 AM	6	133	0	0	139	0	82	8	0	90	5	0	5	0	10	0	0	0	0	0	239
07:30 AM	9	162	0	0	171	0	96	11	0	107	19	0	6	0	25	0	0	0	0	0	303
07:45 AM	17	138	0	0	155	5	155	15	0	175	6	0	8	0	14	0	0	0	0	0	344
Total	43	582	0	0	625	6	401	40	0	447	39	0	24	0	63	0	0	0	0	0	1135
08:00 AM	8	134	1	0	143	1	96	12	0	109	5	0	2	0	7	0	0	0	0	0	259
08:15 AM	7	138	1	0	146	0	95	15	0	110	4	0	7	0	11	1	1	0	0	2	269
08:30 AM	13	140	0	0	153	1	77	14	0	92	3	0	2	0	5	0	0	1	0	1	251
08:45 AM	17	138	0	0	155	1	106	15	0	122	9	0	2	0	11	0	0	0	0	0	288
Total	45	550	2	0	597	3	374	56	0	433	21	0	13	0	34	1	1	1	0	3	1067
*** BREAK ***																					
11:00 AM	4	115	0	0	119	1	107	11	0	119	10	0	6	0	16	0	0	0	0	0	254
11:15 AM	5	119	0	0	124	1	112	16	0	129	5	0	6	0	11	0	0	1	0	1	265
11:30 AM	4	123	0	0	127	0	122	7	1	130	10	0	5	0	15	0	0	1	0	1	273
11:45 AM	14	161	1	0	176	1	119	17	0	137	6	0	9	0	15	0	0	4	0	4	332
Total	27	518	1	0	546	3	460	51	1	515	31	0	26	0	57	0	0	6	0	6	1124
12:00 PM	1	169	0	0	170	0	150	12	1	163	15	0	5	0	20	0	1	1	0	2	355
12:15 PM	11	143	0	0	154	2	147	5	0	154	9	0	0	0	9	0	0	0	0	0	317
12:30 PM	6	139	0	0	145	1	132	8	1	142	17	0	5	0	22	0	0	1	0	1	310
12:45 PM	5	155	1	0	161	1	155	13	0	169	10	0	5	0	15	0	0	2	0	2	347
Total	23	606	1	0	630	4	584	38	2	628	51	0	15	0	66	0	1	4	0	5	1329
*** BREAK ***																					
04:00 PM	9	158	0	0	167	0	159	12	0	171	10	0	10	0	20	1	0	1	0	2	360
04:15 PM	13	142	0	0	155	0	184	11	0	195	11	0	6	0	17	0	0	0	0	0	367
04:30 PM	18	206	1	0	225	2	189	7	0	198	23	0	11	0	34	2	0	4	0	6	463
04:45 PM	13	145	0	0	158	1	158	16	0	175	11	0	6	0	17	2	0	2	0	4	354
Total	53	651	1	0	705	3	690	46	0	739	55	0	33	0	88	5	0	7	0	12	1544
05:00 PM	14	188	1	0	203	0	184	13	1	198	13	0	8	0	21	1	0	1	0	2	424
05:15 PM	7	189	2	0	198	0	168	11	0	179	9	0	7	0	16	0	0	1	0	1	394
05:30 PM	8	161	0	0	169	0	165	6	0	171	7	0	9	1	17	0	0	0	0	0	357
05:45 PM	8	115	0	0	123	0	154	4	0	158	6	0	7	0	13	0	0	3	0	3	297
Total	37	653	3	0	693	0	671	34	1	706	35	0	31	1	67	1	0	5	0	6	1472
Grand Total	228	3560	8	0	3796	19	3180	265	4	3468	232	0	142	1	375	7	2	23	0	32	7671
Apprch %	6	93.8	0.2	0		0.5	91.7	7.6	0.1		61.9	0	37.9	0.3		21.9	6.2	71.9	0		
Total %	3	46.4	0.1	0	49.5	0.2	41.5	3.5	0.1	45.2	3	0	1.9	0	4.9	0.1	0	0.3	0	0.4	
Cars	227	3462					3071														
% Cars	99.6	97.2	62.5	0	97.3	84.2	96.6	94.7	100	96.4	97	0	98.6	100	97.6	85.7	100	87	0	87.5	96.9
Trucks	1	98	3	0	102	3	109	14	0	126	7	0	2	0	9	1	0	3	0	4	241
% Trucks	0.4	2.8	37.5	0	2.7	15.8	3.4	5.3	0	3.6	3	0	1.4	0	2.4	14.3	0	13	0	12.5	3.1

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Overcast
Collected By: Kraft Engineering - MSP
Comments: None
Incidents: None

File Name : 1006 Holly & Woodridge 07-09-2015
Site Code : 01006001
Start Date : 07-09-2015

	Holly Road Northbound					Holly Road Southbound					Woodbridge Boulevard Eastbound					Private Parking Lot Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	9	162	0	0	171	0	96	11	0	107	19	0	6	0	25	0	0	0	0	0	303
07:45 AM	17	138	0	0	155	5	155	15	0	175	6	0	8	0	14	0	0	0	0	0	344
08:00 AM	8	134	1	0	143	1	96	12	0	109	5	0	2	0	7	0	0	0	0	0	259
08:15 AM	7	138	1	0	146	0	95	15	0	110	4	0	7	0	11	1	1	0	0	2	269
Total Volume	41	572	2	0	615	6	442	53	0	501	34	0	23	0	57	1	1	0	0	2	1175
% App. Total	6.7	93	0.3	0		1.2	88.2	10.6	0		59.6	0	40.4	0		50	50	0	0		
PHF	.603	.883	.500	.000	.899	.300	.713	.883	.000	.716	.447	.000	.719	.000	.570	.250	.250	.000	.000	.250	.854
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	1	169	0	0	170	0	150	12	1	163	15	0	5	0	20	0	1	1	0	2	355
12:15 PM	11	143	0	0	154	2	147	5	0	154	9	0	0	0	9	0	0	0	0	0	317
12:30 PM	6	139	0	0	145	1	132	8	1	142	17	0	5	0	22	0	0	1	0	1	310
12:45 PM	5	155	1	0	161	1	155	13	0	169	10	0	5	0	15	0	0	2	0	2	347
Total Volume																					
% App. Total	3.7	96.2	0.2	0		0.6	93	6.1	0.3		77.3	0	22.7	0		0	20	80	0		
PHF	.523	.896	.250	.000	.926	.500	.942	.731	.500	.929	.750	.000	.750	.000	.750	.000	.250	.500	.000	.625	.936
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	18	206	1	0	225	2	189	7	0	198	23	0	11	0	34	2	0	4	0	6	463
04:45 PM	13	145	0	0	158	1	158	16	0	175	11	0	6	0	17	2	0	2	0	4	354
05:00 PM	14	188	1	0	203	0	184	13	1	198	13	0	8	0	21	1	0	1	0	2	424
05:15 PM	7	189	2	0	198	0	168	11	0	179	9	0	7	0	16	0	0	1	0	1	394
Total Volume	52	728	4	0	784	3	699	47	1	750	56	0	32	0	88	5	0	8	0	13	1635
% App. Total	6.6	92.9	0.5	0		0.4	93.2	6.3	0.1		63.6	0	36.4	0		38.5	0	61.5	0		
PHF	.722	.883	.500	.000	.871	.375	.925	.734	.250	.947	.609	.000	.727	.000	.647	.625	.000	.500	.000	.542	.883

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: Unshifted mishits: 2 thru from
Incidents: Bank 2 thru from N , park on

File Name : 1007 Holly & SB I-75 08-11-2015
Site Code : 10070001
Start Date : 08-11-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					SB I-75 Exit Ramp Eastbound					SB I-75 Entrance Ramp Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	0	116	33	0	149	30	119	0	0	149	22	0	189	0	211	0	0	0	0	0	509
06:45 AM	0	125	27	0	152	32	148	0	0	180	35	0	271	0	306	0	0	0	0	0	638
Total	0	241	60	0	301	62	267	0	0	329	57	0	460	0	517	0	0	0	0	0	1147
07:00 AM	0	154	23	0	177	27	66	0	0	93	22	0	97	0	119	0	0	0	0	0	389
07:15 AM	0	146	24	0	170	19	98	0	0	117	35	1	115	0	151	0	0	0	0	0	438
07:30 AM	0	271	19	0	290	25	100	0	0	125	44	0	139	0	183	0	0	0	0	0	598
07:45 AM	0	209	27	0	236	19	144	0	0	163	73	0	191	0	264	0	0	0	0	0	663
Total	0	780	93	0	873	90	408	0	0	498	174	1	542	0	717	0	0	0	0	0	2088
08:00 AM	0	168	23	0	191	28	99	0	0	127	63	0	109	0	172	0	0	0	0	0	490
08:15 AM	0	186	32	0	218	17	94	0	0	111	74	1	140	0	215	0	0	0	0	0	544
08:30 AM	0	167	9	0	176	24	103	0	0	127	68	1	93	0	162	0	0	0	0	0	465
08:45 AM	0	186	16	0	202	9	96	0	0	105	83	0	132	0	215	0	0	0	0	0	522
Total	0	707	80	0	787	78	392	0	0	470	288	2	474	0	764	0	0	0	0	0	2021
*** BREAK ***																					
11:00 AM	0	199	14	0	213	10	86	0	0	96	63	0	91	1	155	0	0	0	0	0	464
11:15 AM	0	191	17	1	209	12	92	0	0	104	55	0	102	1	158	0	0	0	0	0	471
11:30 AM	0	216	18	1	235	12	92	0	0	104	43	0	98	0	141	0	0	0	0	0	480
11:45 AM	0	206	22	0	228	16	117	0	0	133	65	0	86	0	151	0	0	0	0	0	512
Total	0	812	71	2	885	50	387	0	0	437	226	0	377	2	605	0	0	0	0	0	1927
12:00 PM	0	250	28	1	279	13	134	0	0	147	56	0	88	0	144	0	0	0	0	0	570
12:15 PM	0	217	22	1	240	12	115	0	0	127	57	1	109	0	167	0	0	0	0	0	534
12:30 PM	0	200	16	0	216	17	99	0	0	116	59	1	93	0	153	0	0	0	0	0	485
12:45 PM	0	187	17	0	204	11	142	0	0	153	68	0	112	0	180	0	0	0	0	0	537
Total	0	854	83	2	939	53	490	0	0	543	240	2	402	0	644	0	0	0	0	0	2126
*** BREAK ***																					
02:00 PM	0	270	1	0	271	13	107	0	0	120	71	0	115	1	187	0	0	0	0	0	578
02:15 PM	0	206	11	0	217	11	167	0	0	178	90	0	134	0	224	0	0	0	0	0	619
02:30 PM	0	253	11	0	264	12	128	0	0	140	75	0	157	0	232	0	0	0	0	0	636
02:45 PM	0	219	9	0	228	20	118	0	0	138	81	0	137	0	218	0	0	0	0	0	584
Total	0	948	32	0	980	56	520	0	0	576	317	0	543	1	861	0	0	0	0	0	2417
03:00 PM	0	333	4	0	337	8	87	0	0	95	84	0	115	0	199	0	0	0	0	0	631
03:15 PM	0	261	3	0	264	14	91	0	0	105	86	1	129	0	216	0	0	0	0	0	585
03:30 PM	0	335	33	0	368	13	106	0	0	119	84	0	117	0	201	0	0	0	0	0	688
03:45 PM	0	316	14	0	330	13	119	0	0	132	87	0	135	0	222	0	0	0	0	0	684
Total	0	1245	54	0	1299	48	403	0	0	451	341	1	496	0	838	0	0	0	0	0	2588
04:00 PM	0	273	22	0	295	10	99	0	0	109	79	0	136	0	215	0	0	0	0	0	619
04:15 PM	0	229	22	1	252	15	126	0	0	141	88	0	144	0	232	0	0	0	0	0	625
04:30 PM	0	341	17	0	358	23	102	0	0	125	84	0	107	1	192	0	0	0	0	0	675
04:45 PM	0	240	12	0	252	19	87	0	0	106	87	0	135	0	222	0	0	0	0	0	580
Total	0	1083	73	1	1157	67	414	0	0	481	338	0	522	1	861	0	0	0	0	0	2499
05:00 PM	0	325	20	0	345	17	97	0	0	114	62	0	117	0	179	0	0	0	0	0	638
05:15 PM	0	206	17	0	223	26	90	0	0	116	115	0	141	0	256	0	0	0	0	0	595
05:30 PM	0	217	8	0	225	19	101	0	0	120	72	0	132	0	204	0	0	0	0	0	549
05:45 PM	0	198	25	0	223	22	99	0	0	121	96	0	122	0	218	0	0	0	0	0	562
Total	0	946	70	0	1016	84	387	0	0	471	345	0	512	0	857	0	0	0	0	0	2344
Grand Total	0	7616	616	5	8237	588	3668	0	0	4256	2326	6	4328	4	6664	0	0	0	0	0	19157
Apprch %	0	92.5	7.5	0.1		13.8	86.2	0	0		34.9	0.1	64.9	0.1		0	0	0	0		
Total %	0	39.8	3.2	0	43	3.1	19.1	0	0	22.2	12.1	0	22.6	0	34.8	0	0	0	0	0	
Cars	0	7443					3589				2276		4202								18682
% Cars	0	97.7	95	60	97.5	98.1	97.8	0	0	97.9	97.9	83.3	97.1	50	97.3	0	0	0	0	0	97.5

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: Unshifted mishits: 2 thru from
Incidents: Bank 2 thru from N , park on

File Name : 1007 Holly & SB I-75 08-11-2015
Site Code : 10070001
Start Date : 08-11-2015
Page No : 2

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					SB I-75 Exit Ramp Eastbound					SB I-75 Entrance Ramp Westbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Trucks	0	173	31	2	206	11	79	0	0	90	50	1	126	2	179	0	0	0	0	0	475
% Trucks	0	2.3	5	40	2.5	1.9	2.2	0	0	2.1	2.1	16.7	2.9	50	2.7	0	0	0	0	0	2.5

	Holly Road Northbound					Holly Road Southbound					SB I-75 Exit Ramp Eastbound					SB I-75 Entrance Ramp Westbound					
Start Time	Left	Thru	Right	Peds	App. Total		Thru	Right	Peds	App. Total		Thru	Right	Peds	App. Total		Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	271	19	0	290	25	100	0	0	125	44	0	139	0	183	0	0	0	0	0	598
07:45 AM	0	209	27	0	236	19	144	0	0	163	73	0	191	0	264	0	0	0	0	0	663
08:00 AM	0	168	23	0	191	28	99	0	0	127	63	0	109	0	172	0	0	0	0	0	490
08:15 AM	0	186	32	0	218	17	94	0	0	111	74	1	140	0	215	0	0	0	0	0	544
Total Volume	0	834	101	0	935	89	437	0	0	526	254	1	579	0	834	0	0	0	0	0	2295
% App. Total	0	89.2	10.8	0		16.9	83.1	0	0		30.5	0.1	69.4	0		0	0	0	0		
PHF	.000	.769	.789	.000	.806	.795	.759	.000	.000	.807	.858	.250	.758	.000	.790	.000	.000	.000	.000	.000	.865
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	250	28	1	279	13	134	0	0	147	56	0	88	0	144	0	0	0	0	0	570
12:15 PM	0	217	22	1	240	12	115	0	0	127	57	1	109	0	167	0	0	0	0	0	534
12:30 PM	0	200	16	0	216	17	99	0	0	116	59	1	93	0	153	0	0	0	0	0	485
12:45 PM	0	187	17	0	204	11	142	0	0	153	68	0	112	0	180	0	0	0	0	0	537
Total Volume																					
% App. Total	0	90.9	8.8	0.2		9.8	90.2	0	0		37.3	0.3	62.4	0		0	0	0	0		
PHF	.000	.854	.741	.500	.841	.779	.863	.000	.000	.887	.882	.500	.897	.000	.894	.000	.000	.000	.000	.000	.932
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	0	335	33	0	368	13	106	0	0	119	84	0	117	0	201	0	0	0	0	0	688
03:45 PM	0	316	14	0	330	13	119	0	0	132	87	0	135	0	222	0	0	0	0	0	684
04:00 PM	0	273	22	0	295	10	99	0	0	109	79	0	136	0	215	0	0	0	0	0	619
04:15 PM	0	229	22	1	252	15	126	0	0	141	88	0	144	0	232	0	0	0	0	0	625
Total Volume	0	1153	91	1	1245	51	450	0	0	501	338	0	532	0	870	0	0	0	0	0	2616
% App. Total	0	92.6	7.3	0.1		10.2	89.8	0	0		38.9	0	61.1	0		0	0	0	0		
PHF	.000	.860	.689	.250	.846	.850	.893	.000	.000	.888	.960	.000	.924	.000	.938	.000	.000	.000	.000	.000	.951

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: LMM
Comments: None
Incidents: 11:40, 6 car funeral processi

File Name : 1008 Holly & NB I-75 08-11-2015
Site Code : 10080002
Start Date : 08-11-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					NB I-75 Entrance Ramp Eastbound					NB I-75 Exit Ramp Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	92	50	0	0	142	0	121	29	0	150	0	0	0	0	0	26	0	1	0	27	319
06:45 AM	102	77	0	0	179	0	130	41	0	171	0	0	0	0	0	45	0	1	0	46	396
Total	194	127	0	0	321	0	251	70	0	321	0	0	0	0	0	71	0	2	0	73	715
07:00 AM	121	71	0	0	192	0	78	64	0	142	0	0	0	0	0	16	0	9	0	25	359
07:15 AM	107	90	0	0	197	0	99	72	0	171	0	0	0	0	0	24	0	8	1	33	401
07:30 AM	168	152	0	0	320	0	107	88	0	195	0	0	0	0	0	24	0	7	1	32	547
07:45 AM	184	149	0	0	333	0	117	71	0	188	0	0	0	0	0	34	0	13	1	48	569
Total	580	462	0	0	1042	0	401	295	0	696	0	0	0	0	0	98	0	37	3	138	1876
08:00 AM	111	122	0	0	233	0	97	67	0	164	0	0	0	0	0	30	3	8	0	41	438
08:15 AM	115	141	0	0	256	0	82	63	0	145	0	0	0	0	0	21	0	18	0	39	440
08:30 AM	123	106	0	0	229	0	95	86	0	181	0	0	0	0	0	25	1	15	0	41	451
08:45 AM	97	176	0	0	273	0	74	66	0	140	0	0	0	0	0	24	0	15	0	39	452
Total	446	545	0	0	991	0	348	282	0	630	0	0	0	0	0	100	4	56	0	160	1781
*** BREAK ***																					
11:00 AM	97	152	0	0	249	0	83	57	0	140	0	0	0	0	0	15	0	12	0	27	416
11:15 AM	100	156	0	0	256	0	88	57	0	145	0	0	0	0	0	15	0	11	0	26	427
11:30 AM	108	145	0	0	253	0	100	76	0	176	0	0	0	0	0	10	0	6	0	16	445
11:45 AM	98	162	0	0	260	0	104	76	0	180	0	0	0	0	0	19	0	15	0	34	474
Total	403	615	0	0	1018	0	375	266	0	641	0	0	0	0	0	59	0	44	0	103	1762
12:00 PM	121	177	0	0	298	0	130	62	0	192	0	0	0	0	0	21	0	8	0	29	519
12:15 PM	97	164	0	0	261	0	119	52	0	171	0	0	0	0	0	15	0	23	0	38	470
12:30 PM	118	143	0	0	261	0	99	59	0	158	0	0	0	0	0	16	0	16	0	32	451
12:45 PM	91	155	0	0	246	0	151	60	0	211	0	0	0	0	0	13	0	18	0	31	488
Total	427	639	0	0	1066	0	499	233	0	732	0	0	0	0	0	65	0	65	0	130	1928
*** BREAK ***																					
02:00 PM	169	159	0	0	328	0	106	73	1	180	0	0	0	0	0	11	0	11	0	22	530
02:15 PM	98	154	0	0	252	0	151	74	0	225	0	0	0	0	0	20	0	16	0	36	513
02:30 PM	170	152	0	0	322	0	123	70	0	193	0	0	0	0	0	17	0	20	0	37	552
02:45 PM	129	164	0	0	293	0	112	47	0	159	0	0	0	0	0	24	0	27	0	51	503
Total	566	629	0	0	1195	0	492	264	1	757	0	0	0	0	0	72	0	74	0	146	2098
03:00 PM	205	194	0	0	399	0	82	90	1	173	0	0	0	0	0	11	0	28	0	39	611
03:15 PM	159	183	0	0	342	0	75	113	0	188	0	0	0	0	0	20	0	28	0	48	578
03:30 PM	212	178	0	0	390	0	87	84	1	172	0	0	0	0	0	16	0	40	0	56	618
03:45 PM	199	206	0	0	405	1	112	83	0	196	0	0	0	0	0	16	0	25	0	41	642
Total	775	761	0	0	1536	1	356	370	2	729	0	0	0	0	0	63	0	121	0	184	2449
04:00 PM	149	181	0	0	330	0	93	114	0	207	0	0	0	0	0	21	0	34	0	55	592
04:15 PM	151	159	0	0	310	0	103	73	0	176	0	0	0	0	0	25	0	42	0	67	553
04:30 PM	223	188	0	0	411	0	114	110	0	224	0	0	0	0	0	11	0	36	0	47	682
04:45 PM	136	179	0	0	315	0	95	67	0	162	0	0	0	0	0	11	0	50	0	61	538
Total	659	707	0	0	1366	0	405	364	0	769	0	0	0	0	0	68	0	162	0	230	2365
05:00 PM	170	202	0	0	372	0	99	121	0	220	0	0	0	0	0	18	0	32	0	50	642
05:15 PM	152	182	0	0	334	0	100	80	0	180	0	0	0	0	0	26	0	46	0	72	586
05:30 PM	135	150	0	0	285	0	97	73	0	170	0	0	0	0	0	19	0	32	1	52	507
05:45 PM	112	154	0	0	266	0	115	73	0	188	0	0	0	0	0	14	0	42	0	56	510
Total	569	688	0	0	1257	0	411	347	0	758	0	0	0	0	0	77	0	152	1	230	2245
Grand Total	4619	5173	0	0	9792	1	3538	2491	3	6033	0	0	0	0	0	673	4	713	4	1394	17219
Apprch %	47.2	52.8	0	0		0	58.6	41.3	0		0	0	0	0		48.3	0.3	51.1	0.3		
Total %	26.8	30	0	0	56.9	0	20.5	14.5	0	35	0	0	0	0	0	3.9	0	4.1	0	8.1	
Cars	4517	5091					3471	2447													16899
% Cars	97.8	98.4	0	0	98.1	0	98.1	98.2	100	98.1	0	0	0	0	0	97.8	100	98.7	100	98.3	98.1

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: LMM
Comments: None
Incidents: 11:40, 6 car funeral processi

File Name : 1008 Holly & NB I-75 08-11-2015
Site Code : 10080002
Start Date : 08-11-2015

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					NB I-75 Entrance Ramp Eastbound					NB I-75 Exit Ramp Westbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Trucks	102	82	0	0	184	1	67	44	0	112	0	0	0	0	0	15	0	9	0	24	320
% Trucks	2.2	1.6	0	0	1.9	100	1.9	1.8	0	1.9	0	0	0	0	0	2.2	0	1.3	0	1.7	1.9

	Holly Road Northbound					Holly Road Southbound					NB I-75 Entrance Ramp Eastbound					NB I-75 Exit Ramp Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	168	152	0	0	320	0	107	88	0	195	0	0	0	0	0	24	0	7	1	32	547
07:45 AM	184	149	0	0	333	0	117	71	0	188	0	0	0	0	0	34	0	13	1	48	569
08:00 AM	111	122	0	0	233	0	97	67	0	164	0	0	0	0	0	30	3	8	0	41	438
08:15 AM	115	141	0	0	256	0	82	63	0	145	0	0	0	0	0	21	0	18	0	39	440
Total Volume	578	564	0	0	1142	0	403	289	0	692	0	0	0	0	0	109	3	46	2	160	1994
% App. Total	50.6	49.4	0	0		0	58.2	41.8	0		0	0	0	0		68.1	1.9	28.8	1.2		
PHF	.785	.928	.000	.000	.857	.000	.861	.821	.000	.887	.000	.000	.000	.000	.000	.801	.250	.639	.500	.833	.876
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	121	177	0	0	298	0	130	62	0	192	0	0	0	0	0	21	0	8	0	29	519
12:15 PM	97	164	0	0	261	0	119	52	0	171	0	0	0	0	0	15	0	23	0	38	470
12:30 PM	118	143	0	0	261	0	99	59	0	158	0	0	0	0	0	16	0	16	0	32	451
12:45 PM	91	155	0	0	246	0	151	60	0	211	0	0	0	0	0	13	0	18	0	31	488
Total Volume																					
% App. Total	40.1	59.9	0	0		0	68.2	31.8	0		0	0	0	0		50	0	50	0		
PHF	.882	.903	.000	.000	.894	.000	.826	.940	.000	.867	.000	.000	.000	.000	.000	.774	.000	.707	.000	.855	.929
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	199	206	0	0	405	1	112	83	0	196	0	0	0	0	0	16	0	25	0	41	642
04:00 PM	149	181	0	0	330	0	93	114	0	207	0	0	0	0	0	21	0	34	0	55	592
04:15 PM	151	159	0	0	310	0	103	73	0	176	0	0	0	0	0	25	0	42	0	67	553
04:30 PM	223	188	0	0	411	0	114	110	0	224	0	0	0	0	0	11	0	36	0	47	682
Total Volume	722	734	0	0	1456	1	422	380	0	803	0	0	0	0	0	73	0	137	0	210	2469
% App. Total	49.6	50.4	0	0		0.1	52.6	47.3	0		0	0	0	0		34.8	0	65.2	0		
PHF	.809	.891	.000	.000	.886	.250	.925	.833	.000	.896	.000	.000	.000	.000	.000	.730	.000	.815	.000	.784	.905

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: No count 8:24 to 8:27, forced
Incidents: None

File Name : 1009 Holly & Cook (West) Revised 08-04-2015
Site Code : 10090001
Start Date : 08-04-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					Cook Road Eastbound					Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	3	47	0	0	50	0	105	4	0	109	4	0	27	0	31	0	0	0	0	0	190
07:15 AM	11	70	0	0	81	0	130	11	0	141	17	0	25	0	42	0	0	0	0	0	264
07:30 AM	10	97	0	0	107	0	145	14	0	159	24	0	43	0	67	0	0	0	0	0	333
07:45 AM	9	132	0	0	141	0	176	24	0	200	37	0	34	0	71	0	0	0	0	0	412
Total	33	346	0	0	379	0	556	53	0	609	82	0	129	0	211	0	0	0	0	0	1199
08:00 AM	5	101	0	0	106	0	128	10	0	138	21	0	20	0	41	0	0	0	0	0	285
08:15 AM	13	140	0	0	153	0	143	11	0	154	29	0	23	0	52	0	0	0	0	0	359
08:30 AM	2	137	0	0	139	0	152	12	0	164	22	0	28	0	50	0	0	0	0	0	353
08:45 AM	7	169	0	0	176	0	140	23	0	163	41	0	33	0	74	0	0	0	0	0	413
Total	27	547	0	0	574	0	563	56	0	619	113	0	104	0	217	0	0	0	0	0	1410
*** BREAK ***																					
11:00 AM	7	129	0	0	136	0	151	19	0	170	19	0	16	0	35	0	0	0	0	0	341
11:15 AM	10	158	1	0	169	0	167	24	0	191	19	0	16	0	35	0	0	0	0	0	395
11:30 AM	24	189	0	0	213	0	136	32	0	168	22	0	15	0	37	0	0	0	0	0	418
11:45 AM	11	168	0	0	179	0	160	30	0	190	26	0	12	0	38	0	0	0	0	0	407
Total	52	644	1	0	697	0	614	105	0	719	86	0	59	0	145	0	0	0	0	0	1561
12:00 PM	18	183	0	0	201	0	158	34	0	192	30	0	19	1	50	0	0	0	0	0	443
12:15 PM	21	181	1	0	203	0	161	40	0	201	32	0	16	0	48	0	0	0	0	0	452
12:30 PM	13	140	0	0	153	0	177	46	0	223	34	0	23	0	57	0	0	0	0	0	433
12:45 PM	15	144	0	0	159	0	161	26	0	187	37	0	25	0	62	0	0	0	0	0	408
Total	67	648	1	0	716	0	657	146	0	803	133	0	83	1	217	0	0	0	0	0	1736
*** BREAK ***																					
04:00 PM	25	175	0	0	200	0	162	33	0	195	29	1	7	0	37	0	0	0	0	0	432
04:15 PM	24	190	0	1	215	0	172	43	0	215	27	0	21	1	49	0	0	0	1	1	480
04:30 PM	39	200	0	0	239	0	196	30	0	226	36	0	14	0	50	0	0	0	0	0	515
04:45 PM	36	234	0	0	270	0	208	41	0	249	34	2	13	0	49	0	0	0	0	0	568
Total	124	799	0	1	924	0	738	147	0	885	126	3	55	1	185	0	0	0	1	1	1995
05:00 PM	33	223	0	0	256	0	186	63	0	249	33	0	22	0	55	0	0	0	0	0	560
05:15 PM	31	187	0	0	218	0	166	30	0	196	23	0	20	0	43	0	0	0	0	0	457
05:30 PM	26	187	0	0	213	0	170	25	0	195	36	0	23	0	59	0	0	0	0	0	467
05:45 PM	30	198	0	0	228	0	141	38	0	179	47	0	24	0	71	0	0	0	0	0	478
Total	120	795	0	0	915	0	663	156	0	819	139	0	89	0	228	0	0	0	0	0	1962
Grand Total	423	3779	2	1	4205	0	3791	663	0	4454	679	3	519	2	1203	0	0	0	1	1	9863
Apprch %	10.1	89.9	0	0		0	85.1	14.9	0		56.4	0.2	43.1	0.2		0	0	0	100		
Total %	4.3	38.3	0	0	42.6	0	38.4	6.7	0	45.2	6.9	0	5.3	0	12.2	0	0	0	0	0	
Cars	415	3716					3723														
% Cars	98.1	98.3	100	100	98.3	0	98.2	98.6	0	98.3	98.8	100	99	100	98.9	0	0	0	100	100	98.4
Trucks	8	63	0	0	71	0	68	9	0	77	8	0	5	0	13	0	0	0	0	0	161
% Trucks	1.9	1.7	0	0	1.7	0	1.8	1.4	0	1.7	1.2	0	1	0	1.1	0	0	0	0	0	1.6

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: No count 8:24 to 8:27, forced
Incidents: None

File Name : 1009 Holly & Cook (West) Revised 08-04-2015
Site Code : 10090001
Start Date : 08-04-2015
Page No : 2

	Holly Road Northbound					Holly Road Southbound					Cook Road Eastbound					Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	5	101	0	0	106	0	128	10	0	138	21	0	20	0	41	0	0	0	0	0	285
08:15 AM	13	140	0	0	153	0	143	11	0	154	29	0	23	0	52	0	0	0	0	0	359
08:30 AM	2	137	0	0	139	0	152	12	0	164	22	0	28	0	50	0	0	0	0	0	353
08:45 AM	7	169	0	0	176	0	140	23	0	163	41	0	33	0	74	0	0	0	0	0	413
Total Volume	27	547	0	0	574	0	563	56	0	619	113	0	104	0	217	0	0	0	0	0	1410
% App. Total	4.7	95.3	0	0		0	91	9	0		52.1	0	47.9	0		0	0	0	0		
PHF	.519	.809	.000	.000	.815	.000	.926	.609	.000	.944	.689	.000	.788	.000	.733	.000	.000	.000	.000	.000	.854
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	18	183	0	0	201	0	158	34	0	192	30	0	19	1	50	0	0	0	0	0	443
12:15 PM	21	181	1	0	203	0	161	40	0	201	32	0	16	0	48	0	0	0	0	0	452
12:30 PM	13	140	0	0	153	0	177	46	0	223	34	0	23	0	57	0	0	0	0	0	433
12:45 PM	15	144	0	0	159	0	161	26	0	187	37	0	25	0	62	0	0	0	0	0	408
Total Volume																					
% App. Total	9.4	90.5	0.1	0		0	81.8	18.2	0		61.3	0	38.2	0.5		0	0	0	0		
PHF	.798	.885	.250	.000	.882	.000	.928	.793	.000	.900	.899	.000	.833	.250	.875	.000	.000	.000	.000	.000	.960
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	24	190	0	1	215	0	172	43	0	215	27	0	21	1	49	0	0	0	1	1	480
04:30 PM	39	200	0	0	239	0	196	30	0	226	36	0	14	0	50	0	0	0	0	0	515
04:45 PM	36	234	0	0	270	0	208	41	0	249	34	2	13	0	49	0	0	0	0	0	568
05:00 PM	33	223	0	0	256	0	186	63	0	249	33	0	22	0	55	0	0	0	0	0	560
Total Volume	132	847	0	1	980	0	762	177	0	939	130	2	70	1	203	0	0	0	1	1	2123
% App. Total	13.5	86.4	0	0.1		0	81.2	18.8	0		64	1	34.5	0.5		0	0	0	100		
PHF	.846	.905	.000	.250	.907	.000	.916	.702	.000	.943	.903	.250	.795	.250	.923	.000	.000	.000	.250	.250	.934

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: None
Incidents: None

File Name : 1010 Holly & Crook (East) 08-05-2015
Site Code : 10100001
Start Date : 08-05-2015
Page No : 1

Groups Printed- Cars - Trucks

	Holly Road Northbound					Holly Road Southbound					Eastbound					Cook Road (East) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	51	14	0	65	4	97	0	0	101	0	0	0	0	0	17	0	2	0	19	185
07:15 AM	0	65	4	0	69	2	86	0	0	88	0	0	0	0	0	26	0	6	0	32	189
07:30 AM	0	132	14	0	146	3	135	0	0	138	0	0	0	0	0	31	0	7	0	38	322
07:45 AM	0	142	16	0	158	6	170	0	0	176	0	0	0	0	0	39	0	8	0	47	381
Total	0	390	48	0	438	15	488	0	0	503	0	0	0	0	0	113	0	23	0	136	1077
08:00 AM	0	124	12	0	136	5	107	0	0	112	0	0	0	0	0	25	0	8	0	33	281
08:15 AM	0	137	14	0	151	8	115	0	0	123	0	0	0	0	0	32	0	9	0	41	315
08:30 AM	0	141	16	0	157	1	129	0	0	130	0	0	0	0	0	37	0	7	0	44	331
08:45 AM	0	191	18	0	209	3	149	0	0	152	0	0	0	0	0	27	0	10	0	37	398
Total	0	593	60	0	653	17	500	0	0	517	0	0	0	0	0	121	0	34	0	155	1325
*** BREAK ***																					
11:00 AM	0	145	15	1	161	5	137	0	0	142	0	0	0	0	0	25	0	9	0	34	337
11:15 AM	0	141	17	0	158	4	121	0	0	125	0	0	0	0	0	17	0	12	0	29	312
11:30 AM	0	152	34	0	186	4	153	0	0	157	0	0	0	0	0	32	0	8	0	40	383
11:45 AM	0	167	24	0	191	11	180	0	0	191	0	0	0	0	0	24	0	7	1	32	414
Total	0	605	90	1	696	24	591	0	0	615	0	0	0	0	0	98	0	36	1	135	1446
12:00 PM	0	154	16	0	170	5	174	0	0	179	0	0	0	0	0	29	0	22	0	51	400
12:15 PM	0	176	27	0	203	9	197	0	0	206	0	0	0	0	0	23	0	15	0	38	447
12:30 PM	0	161	21	0	182	8	143	0	0	151	0	0	0	0	0	21	0	9	0	30	363
12:45 PM	0	152	17	0	169	5	167	0	0	172	0	0	0	0	0	24	0	7	0	31	372
Total	0	643	81	0	724	27	681	0	0	708	0	0	0	0	0	97	0	53	0	150	1582
*** BREAK ***																					
04:00 PM	0	153	23	0	176	3	160	0	0	163	0	0	0	0	0	16	0	15	0	31	370
04:15 PM	0	209	31	1	241	9	168	0	0	177	0	0	0	0	0	14	0	7	0	21	439
04:30 PM	0	221	19	0	240	6	194	0	0	200	0	0	0	0	0	30	0	10	1	41	481
04:45 PM	0	233	27	0	260	11	166	0	0	177	0	0	0	0	0	21	0	9	0	30	467
Total	0	816	100	1	917	29	688	0	0	717	0	0	0	0	0	81	0	41	1	123	1757
05:00 PM	0	198	25	0	223	11	206	0	0	217	0	0	0	0	0	36	0	14	0	50	490
05:15 PM	0	211	34	0	245	10	169	0	0	179	0	0	0	0	0	28	0	11	0	39	463
05:30 PM	0	186	28	0	214	5	162	0	0	167	0	0	0	0	0	16	0	7	0	23	404
05:45 PM	0	180	23	0	203	10	157	0	0	167	0	0	0	0	0	26	0	7	0	33	403
Total	0	775	110	0	885	36	694	0	0	730	0	0	0	0	0	106	0	39	0	145	1760
Grand Total	0	3822	489	2	4313	148	3642	0	0	3790	0	0	0	0	0	616	0	226	2	844	8947
Apprch %	0	88.6	11.3	0		3.9	96.1	0	0		0	0	0	0		73	0	26.8	0.2		
Total %	0	42.7	5.5	0	48.2	1.7	40.7	0	0	42.4	0	0	0	0	0	6.9	0	2.5	0	9.4	
Cars	0	3763					3573														
% Cars	0	98.5	98	50	98.4	98.6	98.1	0	0	98.1	0	0	0	0	0	98.7	0	98.7	100	98.7	98.3
Trucks	0	59	10	1	70	2	69	0	0	71	0	0	0	0	0	8	0	3	0	11	152
% Trucks	0	1.5	2	50	1.6	1.4	1.9	0	0	1.9	0	0	0	0	0	1.3	0	1.3	0	1.3	1.7

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: None
Incidents: None

File Name : 1010 Holly & Crook (East) 08-05-2015
Site Code : 10100001
Start Date : 08-05-2015
Page No : 2

	Holly Road Northbound					Holly Road Southbound					Eastbound					Cook Road (East) Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	124	12	0	136	5	107	0	0	112	0	0	0	0	0	25	0	8	0	33	281
08:15 AM	0	137	14	0	151	8	115	0	0	123	0	0	0	0	0	32	0	9	0	41	315
08:30 AM	0	141	16	0	157	1	129	0	0	130	0	0	0	0	0	37	0	7	0	44	331
08:45 AM	0	191	18	0	209	3	149	0	0	152	0	0	0	0	0	27	0	10	0	37	398
Total Volume	0	593	60	0	653	17	500	0	0	517	0	0	0	0	0	121	0	34	0	155	1325
% App. Total	0	90.8	9.2	0		3.3	96.7	0	0		0	0	0	0		78.1	0	21.9	0		
PHF	.000	.776	.833	.000	.781	.531	.839	.000	.000	.850	.000	.000	.000	.000	.000	.818	.000	.850	.000	.881	.832
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	0	152	34	0	186	4	153	0	0	157	0	0	0	0	0	32	0	8	0	40	383
11:45 AM	0	167	24	0	191	11	180	0	0	191	0	0	0	0	0	24	0	7	1	32	414
12:00 PM	0	154	16	0	170	5	174	0	0	179	0	0	0	0	0	29	0	22	0	51	400
12:15 PM	0	176	27	0	203	9	197	0	0	206	0	0	0	0	0	23	0	15	0	38	447
Total Volume																					
% App. Total	0	86.5	13.5	0		4	96	0	0		0	0	0	0		67.1	0	32.3	0.6		
PHF	.000	.922	.743	.000	.924	.659	.893	.000	.000	.890	.000	.000	.000	.000	.000	.844	.000	.591	.250	.789	.919
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	221	19	0	240	6	194	0	0	200	0	0	0	0	0	30	0	10	1	41	481
04:45 PM	0	233	27	0	260	11	166	0	0	177	0	0	0	0	0	21	0	9	0	30	467
05:00 PM	0	198	25	0	223	11	206	0	0	217	0	0	0	0	0	36	0	14	0	50	490
05:15 PM	0	211	34	0	245	10	169	0	0	179	0	0	0	0	0	28	0	11	0	39	463
Total Volume	0	863	105	0	968	38	735	0	0	773	0	0	0	0	0	115	0	44	1	160	1901
% App. Total	0	89.2	10.8	0		4.9	95.1	0	0		0	0	0	0		71.9	0	27.5	0.6		
PHF	.000	.926	.772	.000	.931	.864	.892	.000	.000	.891	.000	.000	.000	.000	.000	.799	.000	.786	.250	.800	.970

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Cloudy/Sunny
Collected By: MSP
Comments: None
Incidents: None

File Name : 1012 Cook & Embury 08-18-2015
Site Code : 10120001
Start Date : 08-18-2015
Page No : 1

Groups Printed- Cars - Trucks

	Northbound					Embury Road Southbound					Cook Road Eastbound					Cook Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	12	0	0	0	12	13	24	0	0	37	0	10	6	0	16	65
07:15 AM	0	0	0	0	0	12	0	3	0	15	15	34	0	0	49	0	9	8	0	17	81
07:30 AM	0	0	0	0	0	11	0	7	0	18	18	44	0	0	62	0	18	16	0	34	114
07:45 AM	0	0	0	0	0	16	0	8	0	24	29	27	0	0	56	0	10	16	0	26	106
Total	0	0	0	0	0	51	0	18	0	69	75	129	0	0	204	0	47	46	0	93	366
08:00 AM	0	0	0	0	0	11	0	1	0	12	15	20	0	0	35	0	8	3	0	11	58
08:15 AM	0	0	0	0	0	18	0	13	0	31	17	26	0	0	43	0	15	13	0	28	102
08:30 AM	0	0	0	0	0	16	0	5	0	21	25	26	0	0	51	0	13	9	0	22	94
08:45 AM	0	0	0	0	0	10	0	9	0	19	18	43	0	0	61	0	15	12	0	27	107
Total	0	0	0	0	0	55	0	28	0	83	75	115	0	0	190	0	51	37	0	88	361
*** BREAK ***																					
11:00 AM	0	0	0	0	0	13	0	7	3	23	16	27	0	0	43	0	21	13	0	34	100
11:15 AM	0	0	0	0	0	16	0	13	2	31	18	20	0	0	38	0	17	18	0	35	104
11:30 AM	0	0	0	0	0	19	0	16	0	35	15	28	0	0	43	0	21	5	0	26	104
11:45 AM	0	0	0	0	0	15	0	17	1	33	19	23	0	0	42	0	23	18	0	41	116
Total	0	0	0	0	0	63	0	53	6	122	68	98	0	0	166	0	82	54	0	136	424
12:00 PM	0	0	0	0	0	20	0	18	1	39	17	21	0	0	38	0	35	22	0	57	134
12:15 PM	0	0	0	0	0	15	0	16	0	31	12	17	0	0	29	0	18	23	0	41	101
12:30 PM	0	0	0	0	0	16	0	18	2	36	15	28	0	0	43	0	31	15	0	46	125
12:45 PM	0	0	0	0	0	26	0	15	2	43	22	28	0	0	50	0	31	15	0	46	139
Total	0	0	0	0	0	77	0	67	5	149	66	94	0	0	160	0	115	75	0	190	499
*** BREAK ***																					
04:00 PM	0	0	0	0	0	22	0	22	0	44	16	24	0	0	40	0	33	22	1	56	140
04:15 PM	0	0	0	0	0	17	0	20	1	38	17	24	0	0	41	0	34	23	1	58	137
04:30 PM	0	0	0	0	0	26	0	16	0	42	15	30	0	0	45	0	46	24	0	70	157
04:45 PM	0	0	0	0	0	27	0	25	0	52	21	30	0	0	51	0	41	14	0	55	158
Total	0	0	0	0	0	92	0	83	1	176	69	108	0	0	177	0	154	83	2	239	592
05:00 PM	0	0	0	0	0	23	0	37	0	60	28	29	0	0	57	0	53	21	0	74	191
05:15 PM	0	0	0	0	0	23	0	30	0	53	25	36	0	0	61	0	63	24	0	87	201
05:30 PM	0	0	0	0	0	20	0	32	0	52	21	26	0	0	47	0	34	24	0	58	157
05:45 PM	0	0	0	0	0	25	0	22	0	47	25	28	0	0	53	0	43	24	0	67	167
Total	0	0	0	0	0	91	0	121	0	212	99	119	0	0	218	0	193	93	0	286	716
Grand Total	0	0	0	0	0	429	0	370	12	811	452	663	0	0	1115	0	642	388	2	1032	2958
Apprch %	0	0	0	0		52.9	0	45.6	1.5		40.5	59.5	0	0		0	62.2	37.6	0.2		
Total %	0	0	0	0	0	14.5	0	12.5	0.4	27.4	15.3	22.4	0	0	37.7	0	21.7	13.1	0.1	34.9	
Cars	0	0	0	0	0	425	0	367	12	804	449	659	0	0	1108	0	639	380	2	1021	2933
% Cars	0	0	0	0	0	99.1	0	99.2	100	99.1	99.3	99.4	0	0	99.4	0	99.5	97.9	100	98.9	99.2
Trucks	0	0	0	0	0	4	0	3	0	7	3	4	0	0	7	0	3	8	0	11	25
% Trucks	0	0	0	0	0	0.9	0	0.8	0	0.9	0.7	0.6	0	0	0.6	0	0.5	2.1	0	1.1	0.8

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Cloudy/Sunny
Collected By: MSP
Comments: None
Incidents: None

File Name : 1012 Cook & Embury 08-18-2015
Site Code : 10120001
Start Date : 08-18-2015
Page No : 2

	Northbound					Embury Road Southbound					Cook Road Eastbound					Cook Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	11	0	7	0	18	18	44	0	0	62	0	18	16	0	34	114
07:45 AM	0	0	0	0	0	16	0	8	0	24	29	27	0	0	56	0	10	16	0	26	106
08:00 AM	0	0	0	0	0	11	0	1	0	12	15	20	0	0	35	0	8	3	0	11	58
08:15 AM	0	0	0	0	0	18	0	13	0	31	17	26	0	0	43	0	15	13	0	28	102
Total Volume	0	0	0	0	0	56	0	29	0	85	79	117	0	0	196	0	51	48	0	99	380
% App. Total	0	0	0	0		65.9	0	34.1	0		40.3	59.7	0	0		0	51.5	48.5	0		
PHF	.000	.000	.000	.000	.000	.778	.000	.558	.000	.685	.681	.665	.000	.000	.790	.000	.708	.750	.000	.728	.833
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	20	0	18	1	39	17	21	0	0	38	0	35	22	0	57	134
12:15 PM	0	0	0	0	0	15	0	16	0	31	12	17	0	0	29	0	18	23	0	41	101
12:30 PM	0	0	0	0	0	16	0	18	2	36	15	28	0	0	43	0	31	15	0	46	125
12:45 PM	0	0	0	0	0	26	0	15	2	43	22	28	0	0	50	0	31	15	0	46	139
Total Volume																					
% App. Total	0	0	0	0		51.7	0	45	3.4		41.2	58.8	0	0		0	60.5	39.5	0		
PHF	.000	.000	.000	.000	.000	.740	.000	.931	.625	.866	.750	.833	.000	.000	.800	.000	.821	.815	.000	.833	.897
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	23	0	37	0	60	28	29	0	0	57	0	53	21	0	74	191
05:15 PM	0	0	0	0	0	23	0	30	0	53	25	36	0	0	61	0	63	24	0	87	201
05:30 PM	0	0	0	0	0	20	0	32	0	52	21	26	0	0	47	0	34	24	0	58	157
05:45 PM	0	0	0	0	0	25	0	22	0	47	25	28	0	0	53	0	43	24	0	67	167
Total Volume	0	0	0	0	0	91	0	121	0	212	99	119	0	0	218	0	193	93	0	286	716
% App. Total	0	0	0	0		42.9	0	57.1	0		45.4	54.6	0	0		0	67.5	32.5	0		
PHF	.000	.000	.000	.000	.000	.910	.000	.818	.000	.883	.884	.826	.000	.000	.893	.000	.766	.969	.000	.822	.891

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: I car came in driveway to phot
Incidents: None

File Name : 1013 McWain & Cook 07-30-2015
Site Code : 10130001
Start Date : 07-30-2015
Page No : 1

Groups Printed- Cars - Trucks

	McWain Road Northbound					Southbound					Cook Road Eastbound					Cook Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	0	0	2	0	2	0	0	0	0	0	0	33	3	0	36	2	11	0	0	13	51
06:45 AM	3	0	3	0	6	0	0	0	0	0	0	35	6	0	41	3	10	0	0	13	60
Total	3	0	5	0	8	0	0	0	0	0	0	68	9	0	77	5	21	0	0	26	111
07:00 AM	1	0	2	0	3	0	0	0	0	0	0	24	2	1	27	1	13	0	0	14	44
07:15 AM	0	0	6	0	6	0	0	0	0	0	0	32	4	0	36	3	17	0	0	20	62
07:30 AM	3	0	10	0	13	0	0	0	0	0	0	52	5	0	57	2	13	0	0	15	85
07:45 AM	2	0	2	0	4	0	0	0	0	0	0	50	3	0	53	4	20	0	0	24	81
Total	6	0	20	0	26	0	0	0	0	0	0	158	14	1	173	10	63	0	0	73	272
08:00 AM	1	1	1	0	3	0	0	0	0	0	0	47	0	0	47	2	21	0	0	23	73
08:15 AM	0	0	7	0	7	1	0	0	0	1	0	31	7	0	38	2	16	0	0	18	64
08:30 AM	1	0	4	1	6	0	0	0	0	0	0	48	4	0	52	0	17	0	0	17	75
08:45 AM	4	0	6	0	10	0	0	0	0	0	0	54	2	0	56	2	15	0	0	17	83
Total	6	1	18	1	26	1	0	0	0	1	0	180	13	0	193	6	69	0	0	75	295
*** BREAK ***																					
11:00 AM	5	0	5	0	10	0	0	0	0	0	0	32	1	0	33	4	29	0	0	33	76
11:15 AM	6	0	2	0	8	0	0	0	0	0	0	30	3	0	33	2	28	0	0	30	71
11:30 AM	1	0	5	0	6	0	0	0	0	0	0	39	2	0	41	6	32	0	0	38	85
11:45 AM	2	0	7	0	9	0	0	0	0	0	0	45	2	0	47	5	41	0	0	46	102
Total	14	0	19	0	33	0	0	0	0	0	0	146	8	0	154	17	130	0	0	147	334
12:00 PM	4	0	4	0	8	0	0	0	0	0	0	26	3	0	29	2	34	0	0	36	73
12:15 PM	4	0	4	0	8	0	0	0	0	0	0	41	6	0	47	5	43	0	0	48	103
12:30 PM	5	0	5	0	10	0	0	0	0	0	0	25	3	0	28	5	34	0	0	39	77
12:45 PM	2	0	6	0	8	0	0	0	0	0	0	46	3	0	49	5	34	0	0	39	96
Total	15	0	19	0	34	0	0	0	0	0	0	138	15	0	153	17	145	0	0	162	349
*** BREAK ***																					
02:30 PM	7	0	8	0	15	0	0	0	0	0	0	26	2	0	28	0	39	0	0	39	82
02:45 PM	3	0	6	0	9	0	0	0	0	0	0	44	2	0	46	1	36	0	0	37	92
Total	10	0	14	0	24	0	0	0	0	0	0	70	4	0	74	1	75	0	0	76	174
03:00 PM	10	0	3	0	13	0	0	0	0	0	0	36	2	0	38	6	55	2	0	63	114
03:15 PM	4	0	4	0	8	0	0	0	0	0	0	32	3	0	35	4	42	0	0	46	89
03:30 PM	9	0	8	0	17	0	0	0	0	0	0	32	2	0	34	2	40	0	0	42	93
03:45 PM	6	0	7	0	13	0	0	0	0	0	0	32	2	0	34	7	44	0	0	51	98
Total	29	0	22	0	51	0	0	0	0	0	0	132	9	0	141	19	181	2	0	202	394
04:00 PM	2	0	5	0	7	0	0	0	0	0	0	43	1	0	44	9	39	0	0	48	99
04:15 PM	3	0	3	0	6	0	0	0	0	0	0	30	1	0	31	3	58	0	0	61	98
04:30 PM	7	0	7	0	14	0	0	0	0	0	0	49	3	0	52	4	59	0	0	63	129
04:45 PM	3	0	5	0	8	0	0	0	0	0	0	32	2	0	34	8	63	0	0	71	113
Total	15	0	20	0	35	0	0	0	0	0	0	154	7	0	161	24	219	0	0	243	439
05:00 PM	5	0	6	0	11	0	0	0	0	0	0	40	1	0	41	4	57	0	0	61	113
05:15 PM	5	0	7	0	12	0	0	0	0	0	0	35	4	0	39	9	68	0	0	77	128
05:30 PM	4	0	7	0	11	0	0	0	0	0	0	47	4	0	51	5	59	0	0	64	126
05:45 PM	3	0	11	0	14	0	0	0	0	0	0	36	3	0	39	6	63	0	0	69	122
Total	17	0	31	0	48	0	0	0	0	0	0	158	12	0	170	24	247	0	0	271	489
Grand Total	115	1	168	1	285	1	0	0	0	1	0	1204	91	1	1296	123	1150	2	0	1275	2857
Apprch %	40.4	0.4	58.9	0.4		100	0	0	0		0	92.9	7	0.1		9.6	90.2	0.2	0		
Total %	4	0	5.9	0	10	0	0	0	0	0	0	42.1	3.2	0	45.4	4.3	40.3	0.1	0	44.6	
Cars	112	1	165	1	279	1	0	0	0	1	0	1192					1146				
% Cars	97.4	100	98.2	100	97.9	100	0	0	0	100	0	99	100	100	99.1	100	99.7	100	0	99.7	99.2
Trucks	3	0	3	0	6	0	0	0	0	0	0	12	0	0	12	0	4	0	0	4	22
% Trucks	2.6	0	1.8	0	2.1	0	0	0	0	0	0	1	0	0	0.9	0	0.3	0	0	0.3	0.8

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	McWain Road Northbound					Southbound					Cook Road Eastbound					Cook Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	3	0	10	0	13	0	0	0	0	0	0	52	5	0	57	2	13	0	0	15	85
07:45 AM	2	0	2	0	4	0	0	0	0	0	0	50	3	0	53	4	20	0	0	24	81
08:00 AM	1	1	1	0	3	0	0	0	0	0	0	47	0	0	47	2	21	0	0	23	73
08:15 AM	0	0	7	0	7	1	0	0	0	1	0	31	7	0	38	2	16	0	0	18	64
Total Volume	6	1	20	0	27	1	0	0	0	1	0	180	15	0	195	10	70	0	0	80	303
% App. Total	22.2	3.7	74.1	0		100	0	0	0		0	92.3	7.7	0		12.5	87.5	0	0		
PHF	.500	.250	.500	.000	.519	.250	.000	.000	.000	.250	.000	.865	.536	.000	.855	.625	.833	.000	.000	.833	.891
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	1	0	5	0	6	0	0	0	0	0	0	39	2	0	41	6	32	0	0	38	85
11:45 AM	2	0	7	0	9	0	0	0	0	0	0	45	2	0	47	5	41	0	0	46	102
12:00 PM	4	0	4	0	8	0	0	0	0	0	0	26	3	0	29	2	34	0	0	36	73
12:15 PM	4	0	4	0	8	0	0	0	0	0	0	41	6	0	47	5	43	0	0	48	103
Total Volume																					
% App. Total	35.5	0	64.5	0		0	0	0	0		0	92.1	7.9	0		10.7	89.3	0	0		
PHF	.688	.000	.714	.000	.861	.000	.000	.000	.000	.000	.000	.839	.542	.000	.872	.750	.872	.000	.000	.875	.881
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	5	0	6	0	11	0	0	0	0	0	0	40	1	0	41	4	57	0	0	61	113
05:15 PM	5	0	7	0	12	0	0	0	0	0	0	35	4	0	39	9	68	0	0	77	128
05:30 PM	4	0	7	0	11	0	0	0	0	0	0	47	4	0	51	5	59	0	0	64	126
05:45 PM	3	0	11	0	14	0	0	0	0	0	0	36	3	0	39	6	63	0	0	69	122
Total Volume	17	0	31	0	48	0	0	0	0	0	0	158	12	0	170	24	247	0	0	271	489
% App. Total	35.4	0	64.6	0		0	0	0	0		0	92.9	7.1	0		8.9	91.1	0	0		
PHF	.850	.000	.705	.000	.857	.000	.000	.000	.000	.000	.000	.840	.750	.000	.833	.667	.908	.000	.000	.880	.955

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: None
Incidents: None

File Name : 1014 Baldwin & Halsey 07-28-2015
Site Code : 10140001
Start Date : 07-28-2015
Page No : 1

Groups Printed- Cars - Trucks

	Halsey Road Northbound					Fire Department Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	3	0	3	0	0	0	0	0	0	79	0	0	79	1	48	0	0	49	131
07:15 AM	0	0	7	0	7	0	0	0	0	0	0	71	3	0	74	0	70	0	0	70	151
07:30 AM	1	0	4	0	5	0	0	0	0	0	0	89	1	0	90	1	68	0	0	69	164
07:45 AM	1	0	8	0	9	0	0	0	0	0	0	91	1	0	92	0	64	0	0	64	165
Total	2	0	22	0	24	0	0	0	0	0	0	330	5	0	335	2	250	0	0	252	611
08:00 AM	0	0	3	0	3	0	0	0	0	0	0	88	2	0	90	3	56	0	0	59	152
08:15 AM	0	0	6	0	6	0	0	0	0	0	0	80	1	0	81	3	54	0	0	57	144
08:30 AM	0	0	8	0	8	0	0	0	0	0	0	59	3	0	62	0	37	0	0	37	107
08:45 AM	1	0	1	0	2	0	0	0	0	0	0	69	0	0	69	3	53	0	0	56	127
Total	1	0	18	0	19	0	0	0	0	0	0	296	6	0	302	9	200	0	0	209	530
*** BREAK ***																					
11:00 AM	1	0	1	0	2	0	0	0	0	0	1	65	1	0	67	1	51	0	0	52	121
11:15 AM	1	0	4	0	5	0	0	0	0	0	0	62	1	0	63	2	67	0	0	69	137
11:30 AM	2	0	8	0	10	0	1	0	0	1	0	48	1	0	49	2	54	0	0	56	116
11:45 AM	1	0	5	0	6	0	0	0	0	0	0	57	0	0	57	5	49	0	0	54	117
Total	5	0	18	0	23	0	1	0	0	1	1	232	3	0	236	10	221	0	0	231	491
12:00 PM	0	0	2	0	2	0	0	1	0	1	0	76	0	0	76	6	70	1	0	77	156
12:15 PM	0	0	6	0	6	0	0	0	0	0	0	69	1	0	70	2	63	0	0	65	141
12:30 PM	1	0	8	0	9	0	0	1	0	1	0	66	0	0	66	3	61	1	0	65	141
12:45 PM	1	0	1	0	2	0	0	0	0	0	0	63	1	0	64	3	65	0	0	68	134
Total	2	0	17	0	19	0	0	2	0	2	0	274	2	0	276	14	259	2	0	275	572
*** BREAK ***																					
04:00 PM	1	0	2	1	4	1	0	0	0	1	2	75	1	1	79	2	119	1	0	122	206
04:15 PM	1	0	3	0	4	0	0	0	0	0	0	73	0	0	73	3	132	0	0	135	212
04:30 PM	0	0	6	0	6	0	0	0	0	0	0	87	2	0	89	3	122	0	0	125	220
04:45 PM	0	0	5	0	5	0	0	0	0	0	0	79	3	1	83	3	120	0	0	123	211
Total	2	0	16	1	19	1	0	0	0	1	2	314	6	2	324	11	493	1	0	505	849
05:00 PM	0	0	4	0	4	0	0	0	0	0	0	95	3	0	98	4	124	0	0	128	230
05:15 PM	0	0	3	0	3	0	0	0	0	0	0	83	0	0	83	4	129	0	0	133	219
05:30 PM	1	0	5	0	6	0	0	0	0	0	0	71	0	1	72	6	100	0	0	106	184
05:45 PM	2	0	1	0	3	0	0	0	0	0	0	74	1	0	75	3	111	0	0	114	192
Total	3	0	13	0	16	0	0	0	0	0	0	323	4	1	328	17	464	0	0	481	825
Grand Total	15	0	104	1	120	1	1	2	0	4	3	1769	26	3	1801	63	1887	3	0	1953	3878
Apprch %	12.5	0	86.7	0.8		25	25	50	0		0.2	98.2	1.4	0.2		3.2	96.6	0.2	0		
Total %	0.4	0	2.7	0	3.1	0	0	0.1	0	0.1	0.1	45.6	0.7	0.1	46.4	1.6	48.7	0.1	0	50.4	
Cars	15	0	103	1	119	1	1	2	0	4	3	1716					1839				
% Cars	100	0	99	100	99.2	100	100	100	0	100	100	97	96.2	100	97	98.4	97.5	100	0	97.5	97.3
Trucks	0	0	1	0	1	0	0	0	0	0	0	53	1	0	54	1	48	0	0	49	104
% Trucks	0	0	1	0	0.8	0	0	0	0	0	0	3	3.8	0	3	1.6	2.5	0	0	2.5	2.7

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: None
Incidents: None

File Name : 1014 Baldwin & Halsey 07-28-2015
Site Code : 10140001
Start Date : 07-28-2015
Page No : 2

	Halsey Road Northbound					Fire Department Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	7	0	7	0	0	0	0	0	0	71	3	0	74	0	70	0	0	70	151
07:30 AM	1	0	4	0	5	0	0	0	0	0	0	89	1	0	90	1	68	0	0	69	164
07:45 AM	1	0	8	0	9	0	0	0	0	0	0	91	1	0	92	0	64	0	0	64	165
08:00 AM	0	0	3	0	3	0	0	0	0	0	0	88	2	0	90	3	56	0	0	59	152
Total Volume	2	0	22	0	24	0	0	0	0	0	0	339	7	0	346	4	258	0	0	262	632
% App. Total	8.3	0	91.7	0		0	0	0	0		0	98	2	0		1.5	98.5	0	0		
PHF	.500	.000	.688	.000	.667	.000	.000	.000	.000	.000	.000	.931	.583	.000	.940	.333	.921	.000	.000	.936	.958
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	2	0	2	0	0	1	0	1	0	76	0	0	76	6	70	1	0	77	156
12:15 PM	0	0	6	0	6	0	0	0	0	0	0	69	1	0	70	2	63	0	0	65	141
12:30 PM	1	0	8	0	9	0	0	1	0	1	0	66	0	0	66	3	61	1	0	65	141
12:45 PM	1	0	1	0	2	0	0	0	0	0	0	63	1	0	64	3	65	0	0	68	134
Total Volume																					
% App. Total	10.5	0	89.5	0		0	0	100	0		0	99.3	0.7	0		5.1	94.2	0.7	0		
PHF	.500	.000	.531	.000	.528	.000	.000	.500	.000	.500	.000	.901	.500	.000	.908	.583	.925	.500	.000	.893	.917
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	6	0	6	0	0	0	0	0	0	87	2	0	89	3	122	0	0	125	220
04:45 PM	0	0	5	0	5	0	0	0	0	0	0	79	3	1	83	3	120	0	0	123	211
05:00 PM	0	0	4	0	4	0	0	0	0	0	0	95	3	0	98	4	124	0	0	128	230
05:15 PM	0	0	3	0	3	0	0	0	0	0	0	83	0	0	83	4	129	0	0	133	219
Total Volume	0	0	18	0	18	0	0	0	0	0	0	344	8	1	353	14	495	0	0	509	880
% App. Total	0	0	100	0		0	0	0	0		0	97.5	2.3	0.3		2.8	97.2	0	0		
PHF	.000	.000	.750	.000	.750	.000	.000	.000	.000	.000	.000	.905	.667	.250	.901	.875	.959	.000	.000	.957	.957

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: 1 u-turn in Health Park Blvd
Incidents: None

File Name : 1015 Baldwin & Health Park 07-29-2015
Site Code : 10150001
Start Date : 07-29-2015
Page No : 1

Groups Printed- Cars - Trucks

	Northbound					Health Park Boulevard Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	0	0	0	0	0	0	0	11	0	11	44	70	0	0	114	0	38	9	0	47	172
06:45 AM	0	0	0	0	0	1	0	4	0	5	54	77	0	1	132	0	40	9	0	49	186
Total	0	0	0	0	0	1	0	15	0	16	98	147	0	1	246	0	78	18	0	96	358
07:00 AM	0	0	0	0	0	3	0	5	0	8	26	81	0	0	107	0	48	5	0	53	168
07:15 AM	0	0	0	0	0	2	0	9	0	11	39	93	0	0	132	0	49	5	0	54	197
07:30 AM	0	0	0	0	0	3	0	27	0	30	32	72	0	0	104	0	61	3	0	64	198
07:45 AM	0	0	0	0	0	3	0	13	0	16	49	109	0	1	159	0	46	12	1	59	234
Total	0	0	0	0	0	11	0	54	0	65	146	355	0	1	502	0	204	25	1	230	797
08:00 AM	0	0	0	0	0	2	0	3	0	5	24	102	0	0	126	0	40	5	0	45	176
08:15 AM	0	0	0	0	0	4	0	2	0	6	26	74	0	0	100	0	57	9	0	66	172
08:30 AM	0	0	0	0	0	2	0	10	1	13	24	69	0	1	94	0	51	6	6	63	170
08:45 AM	0	0	0	0	0	2	0	10	1	13	44	64	0	0	108	0	48	7	0	55	176
Total	0	0	0	0	0	10	0	25	2	37	118	309	0	1	428	0	196	27	6	229	694
*** BREAK ***																					
11:00 AM	0	0	0	0	0	1	0	13	0	14	11	41	0	0	52	0	55	3	0	58	124
11:15 AM	0	0	0	0	0	6	0	17	0	23	14	50	0	0	64	0	53	3	0	56	143
11:30 AM	0	0	0	0	0	4	0	21	0	25	11	47	0	0	58	0	47	0	0	47	130
11:45 AM	0	0	0	0	0	2	0	15	0	17	15	46	0	0	61	0	60	3	0	63	141
Total	0	0	0	0	0	13	0	66	0	79	51	184	0	0	235	0	215	9	0	224	538
12:00 PM	0	0	0	0	0	9	0	21	0	30	11	50	0	0	61	0	55	2	0	57	148
12:15 PM	0	0	0	0	0	7	0	20	0	27	15	71	0	0	86	0	45	4	0	49	162
12:30 PM	0	0	0	0	0	0	0	12	0	12	20	68	0	0	88	0	42	5	0	47	147
12:45 PM	0	0	0	0	0	4	0	17	0	21	16	66	0	0	82	0	66	5	0	71	174
Total	0	0	0	0	0	20	0	70	0	90	62	255	0	0	317	0	208	16	0	224	631
*** BREAK ***																					
02:30 PM	0	0	0	0	0	7	0	21	0	28	29	50	0	0	79	0	89	1	0	90	197
02:45 PM	0	0	0	0	0	4	0	21	0	25	20	72	0	0	92	0	76	1	0	77	194
Total	0	0	0	0	0	11	0	42	0	53	49	122	0	0	171	0	165	2	0	167	391
03:00 PM	0	0	0	0	0	4	0	31	0	35	14	68	0	0	82	0	91	3	0	94	211
03:15 PM	0	0	0	0	0	4	0	25	0	29	16	68	0	0	84	0	99	2	0	101	214
03:30 PM	0	0	0	0	0	7	0	71	0	78	14	66	0	0	80	0	96	1	0	97	255
03:45 PM	0	0	0	0	0	7	0	30	0	37	13	80	0	0	93	0	75	4	0	79	209
Total	0	0	0	0	0	22	0	157	0	179	57	282	0	0	339	0	361	10	0	371	889
04:00 PM	0	0	0	0	0	11	0	31	0	42	12	69	0	0	81	0	107	3	0	110	233
04:15 PM	0	0	0	0	0	3	0	35	0	38	12	64	0	0	76	0	108	3	0	111	225
04:30 PM	0	0	0	0	0	5	0	37	0	42	7	76	0	0	83	0	118	2	0	120	245
04:45 PM	0	0	0	0	0	6	0	29	0	35	18	71	0	0	89	0	115	5	0	120	244
Total	0	0	0	0	0	25	0	132	0	157	49	280	0	0	329	0	448	13	0	461	947
05:00 PM	0	0	0	0	0	9	0	26	0	35	14	73	0	0	87	0	124	2	0	126	248
05:15 PM	0	0	0	0	0	4	0	25	0	29	13	74	0	0	87	0	95	6	0	101	217
05:30 PM	0	0	0	0	0	5	0	25	0	30	7	86	0	0	93	0	113	1	0	114	237
05:45 PM	0	0	0	0	0	1	0	13	0	14	15	75	0	0	90	0	100	1	0	101	205
Total	0	0	0	0	0	19	0	89	0	108	49	308	0	0	357	0	432	10	0	442	907
Grand Total	0	0	0	0	0	132	0	650	2	784	679	2242	0	3	2924	0	2307	130	7	2444	6152
Apprch %	0	0	0	0		16.8	0	82.9	0.3		23.2	76.7	0	0.1		0	94.4	5.3	0.3		
Total %	0	0	0	0	0	2.1	0	10.6	0	12.7	11	36.4	0	0	47.5	0	37.5	2.1	0.1	39.7	
Cars	0	0	0	0	0	125	0	641	2	768	669	2185					2243				
% Cars	0	0	0	0	0	94.7	0	98.6	100	98	98.5	97.5	0	100	97.7	0	97.2	96.9	100	97.2	97.5
Trucks	0	0	0	0	0	7	0	9	0	16	10	57	0	0	67	0	64	4	0	68	151
% Trucks	0	0	0	0	0	5.3	0	1.4	0	2	1.5	2.5	0	0	2.3	0	2.8	3.1	0	2.8	2.5

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Northbound					Health Park Boulevard Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	2	0	9	0	11	39	93	0	0	132	0	49	5	0	54	197
07:30 AM	0	0	0	0	0	3	0	27	0	30	32	72	0	0	104	0	61	3	0	64	198
07:45 AM	0	0	0	0	0	3	0	13	0	16	49	109	0	1	159	0	46	12	1	59	234
08:00 AM	0	0	0	0	0	2	0	3	0	5	24	102	0	0	126	0	40	5	0	45	176
Total Volume	0	0	0	0	0	10	0	52	0	62	144	376	0	1	521	0	196	25	1	222	805
% App. Total	0	0	0	0		16.1	0	83.9	0		27.6	72.2	0	0.2		0	88.3	11.3	0.5		
PHF	.000	.000	.000	.000	.000	.833	.000	.481	.000	.517	.735	.862	.000	.250	.819	.000	.803	.521	.250	.867	.860
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	9	0	21	0	30	11	50	0	0	61	0	55	2	0	57	148
12:15 PM	0	0	0	0	0	7	0	20	0	27	15	71	0	0	86	0	45	4	0	49	162
12:30 PM	0	0	0	0	0	0	0	12	0	12	20	68	0	0	88	0	42	5	0	47	147
12:45 PM	0	0	0	0	0	4	0	17	0	21	16	66	0	0	82	0	66	5	0	71	174
Total Volume																					
% App. Total	0	0	0	0		22.2	0	77.8	0		19.6	80.4	0	0		0	92.9	7.1	0		
PHF	.000	.000	.000	.000	.000	.556	.000	.833	.000	.750	.775	.898	.000	.000	.901	.000	.788	.800	.000	.789	.907
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	3	0	35	0	38	12	64	0	0	76	0	108	3	0	111	225
04:30 PM	0	0	0	0	0	5	0	37	0	42	7	76	0	0	83	0	118	2	0	120	245
04:45 PM	0	0	0	0	0	6	0	29	0	35	18	71	0	0	89	0	115	5	0	120	244
05:00 PM	0	0	0	0	0	9	0	26	0	35	14	73	0	0	87	0	124	2	0	126	248
Total Volume	0	0	0	0	0	23	0	127	0	150	51	284	0	0	335	0	465	12	0	477	962
% App. Total	0	0	0	0		15.3	0	84.7	0		15.2	84.8	0	0		0	97.5	2.5	0		
PHF	.000	.000	.000	.000	.000	.639	.000	.858	.000	.893	.708	.934	.000	.000	.941	.000	.938	.600	.000	.946	.970

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: One u-turn around boulevard is
Incidents: Pedestrian count is not corre

File Name : 1016 Health Park & Woodridge 08-13-2015
Site Code : 10160001
Start Date : 08-13-2015
Page No : 1

Groups Printed- Cars - Trucks

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Woodridge Boulevard Eastbound					Woodridge Boulevard Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	13	31	3	0	47	1	4	1	0	6	4	7	2	1	14	4	17	5	0	26	93
06:45 AM	20	34	6	0	60	0	3	1	0	4	2	2	3	1	8	5	23	14	0	42	114
Total	33	65	9	0	107	1	7	2	0	10	6	9	5	2	22	9	40	19	0	68	207
07:00 AM	7	17	1	6	31	0	5	0	0	5	1	6	2	0	9	3	9	7	1	20	65
07:15 AM	4	36	13	0	53	1	5	1	0	7	0	2	0	2	4	3	3	4	1	11	75
07:30 AM	4	29	12	3	48	4	22	4	0	30	6	24	9	5	44	2	1	5	4	12	134
07:45 AM	9	34	12	2	57	2	12	1	0	15	0	3	3	3	9	6	6	10	2	24	105
Total	24	116	38	11	189	7	44	6	0	57	7	35	14	10	66	14	19	26	8	67	379
08:00 AM	3	24	6	5	38	1	9	1	0	11	1	4	1	3	9	1	4	6	3	14	72
08:15 AM	9	23	5	4	41	0	9	0	0	9	1	1	3	8	13	4	1	2	2	9	72
08:30 AM	3	28	4	19	54	1	10	1	0	12	0	1	1	4	6	2	2	3	0	7	79
08:45 AM	1	22	8	14	45	0	12	1	0	13	2	0	1	6	9	4	6	5	0	15	82
Total	16	97	23	42	178	2	40	3	0	45	4	6	6	21	37	11	13	16	5	45	305
*** BREAK ***																					
11:00 AM	2	8	3	5	18	2	14	0	0	16	1	2	2	0	5	8	3	4	5	20	59
11:15 AM	4	14	4	5	27	4	21	2	0	27	1	2	0	0	3	7	2	2	5	16	73
11:30 AM	6	9	5	3	23	0	11	0	0	11	0	4	7	0	11	5	5	3	2	15	60
11:45 AM	7	17	7	5	36	2	11	3	0	16	1	3	3	1	8	5	9	4	3	21	81
Total	19	48	19	18	104	8	57	5	0	70	3	11	12	1	27	25	19	13	15	72	273
12:00 PM	4	9	3	4	20	4	19	3	0	26	5	3	0	2	10	3	11	5	2	21	77
12:15 PM	2	20	4	13	39	2	18	0	0	20	3	1	0	0	4	9	6	3	12	30	93
12:30 PM	3	12	6	9	30	3	7	1	0	11	1	5	2	1	9	1	5	7	3	16	66
12:45 PM	1	19	3	5	28	3	11	7	0	21	0	2	1	0	3	5	4	7	4	20	72
Total	10	60	16	31	117	12	55	11	0	78	9	11	3	3	26	18	26	22	21	87	308
*** BREAK ***																					
02:30 PM	15	19	6	4	44	2	22	4	1	29	4	10	4	1	19	3	12	2	0	17	109
02:45 PM	10	17	7	9	43	1	16	1	2	20	2	5	1	0	8	4	10	4	1	19	90
Total	25	36	13	13	87	3	38	5	3	49	6	15	5	1	27	7	22	6	1	36	199
03:00 PM	2	10	1	2	15	6	31	2	1	40	1	5	7	0	13	11	7	4	1	23	91
03:15 PM	3	14	6	0	23	4	21	2	1	28	1	12	7	0	20	5	5	1	0	11	82
03:30 PM	3	16	4	3	26	14	35	3	0	52	0	34	24	4	62	7	6	1	0	14	154
03:45 PM	3	8	1	0	12	5	21	1	0	27	3	4	7	0	14	4	5	4	0	13	66
Total	11	48	12	5	76	29	108	8	2	147	5	55	45	4	109	27	23	10	1	61	393
04:00 PM	2	11	4	0	17	1	21	0	0	22	3	9	7	2	21	3	3	3	2	11	71
04:15 PM	1	10	3	2	16	2	21	1	0	24	1	6	8	2	17	3	7	2	0	12	69
04:30 PM	4	6	7	2	19	4	27	3	0	34	1	6	8	2	17	6	1	1	0	8	78
04:45 PM	3	16	10	2	31	3	12	2	0	17	0	3	2	0	5	3	4	3	0	10	63
Total	10	43	24	6	83	10	81	6	0	97	5	24	25	6	60	15	15	9	2	41	281
05:00 PM	0	8	6	0	14	3	25	0	1	29	1	3	4	0	8	2	2	0	1	5	56
05:15 PM	0	8	10	4	22	4	22	2	2	30	0	5	3	2	10	0	5	2	0	7	69
05:30 PM	2	12	1	2	17	3	23	2	1	29	3	5	3	2	13	2	3	2	0	7	66
05:45 PM	3	6	3	2	14	2	13	2	0	17	1	1	3	4	9	2	5	1	0	8	48
Total	5	34	20	8	67	12	83	6	4	105	5	14	13	8	40	6	15	5	1	27	239
Grand Total	153	547	174	134	1008	84	513	52	9	658	50	180	128	56	414	132	192	126	54	504	2584
Apprch %	15.2	54.3	17.3	13.3		12.8	78	7.9	1.4		12.1	43.5	30.9	13.5		26.2	38.1	25	10.7		
Total %	5.9	21.2	6.7	5.2	39	3.3	19.9	2	0.3	25.5	1.9	7	5	2.2	16	5.1	7.4	4.9	2.1	19.5	
Cars	144	542	170	134	990	82	502	47	9	640	47	161	121	56	385	127	165	123	54	469	2484
% Cars	94.1	99.1	97.7	100	98.2	97.6	97.9	90.4	100	97.3	94	89.4	94.5	100	93	96.2	85.9	97.6	100	93.1	96.1
Trucks	9	5	4	0	18	2	11	5	0	18	3	19	7	0	29	5	27	3	0	35	100
% Trucks	5.9	0.9	2.3	0	1.8	2.4	2.1	9.6	0	2.7	6	10.6	5.5	0	7	3.8	14.1	2.4	0	6.9	3.9

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Woodridge Boulevard Eastbound					Woodridge Boulevard Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	20	34	6	0	60	0	3	1	0	4	2	2	3	1	8	5	23	14	0	42	114
07:00 AM	7	17	1	6	31	0	5	0	0	5	1	6	2	0	9	3	9	7	1	20	65
07:15 AM	4	36	13	0	53	1	5	1	0	7	0	2	0	2	4	3	3	4	1	11	75
07:30 AM	4	29	12	3	48	4	22	4	0	30	6	24	9	5	44	2	1	5	4	12	134
Total Volume	35	116	32	9	192	5	35	6	0	46	9	34	14	8	65	13	36	30	6	85	388
% App. Total	18.2	60.4	16.7	4.7		10.9	76.1	13	0		13.8	52.3	21.5	12.3		15.3	42.4	35.3	7.1		
PHF	.438	.806	.615	.375	.800	.313	.398	.375	.000	.383	.375	.354	.389	.400	.369	.650	.391	.536	.375	.506	.724
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	7	17	7	5	36	2	11	3	0	16	1	3	3	1	8	5	9	4	3	21	81
12:00 PM	4	9	3	4	20	4	19	3	0	26	5	3	0	2	10	3	11	5	2	21	77
12:15 PM	2	20	4	13	39	2	18	0	0	20	3	1	0	0	4	9	6	3	12	30	93
12:30 PM	3	12	6	9	30	3	7	1	0	11	1	5	2	1	9	1	5	7	3	16	66
Total Volume																					
% App. Total	12.8	46.4	16	24.8		15.1	75.3	9.6	0		32.3	38.7	16.1	12.9		20.5	35.2	21.6	22.7		
PHF	.571	.725	.714	.596	.801	.688	.724	.583	.000	.702	.500	.600	.417	.500	.775	.500	.705	.679	.417	.733	.852
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	10	17	7	9	43	1	16	1	2	20	2	5	1	0	8	4	10	4	1	19	90
03:00 PM	2	10	1	2	15	6	31	2	1	40	1	5	7	0	13	11	7	4	1	23	91
03:15 PM	3	14	6	0	23	4	21	2	1	28	1	12	7	0	20	5	5	1	0	11	82
03:30 PM	3	16	4	3	26	14	35	3	0	52	0	34	24	4	62	7	6	1	0	14	154
Total Volume	18	57	18	14	107	25	103	8	4	140	4	56	39	4	103	27	28	10	2	67	417
% App. Total	16.8	53.3	16.8	13.1		17.9	73.6	5.7	2.9		3.9	54.4	37.9	3.9		40.3	41.8	14.9	3		
PHF	.450	.838	.643	.389	.622	.446	.736	.667	.500	.673	.500	.412	.406	.250	.415	.614	.700	.625	.500	.728	.677

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Partly Cloudy
Collected By: PRH
Comments: Appears to have been an event
Incidents: None

File Name : 1017 Health Park & Genesys 08-13-2015
Site Code : 10170001
Start Date : 08-13-2015
Page No : 1

Groups Printed- Cars - Trucks

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Genesys Parkway Eastbound					Genesys Parkway Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	11	26	4	4	45	22	3	20	0	45	4	0	2	0	6	1	0	10	0	11	107
06:45 AM	18	32	1	10	61	23	1	21	0	45	1	1	1	0	3	2	0	18	3	23	132
Total	29	58	5	14	106	45	4	41	0	90	5	1	3	0	9	3	0	28	3	34	239
07:00 AM	10	10	4	1	25	12	3	3	2	20	1	1	1	0	3	1	0	8	3	12	60
07:15 AM	7	25	8	0	40	45	1	5	0	51	3	1	4	0	8	2	0	16	3	21	120
07:30 AM	10	19	10	1	40	55	14	5	1	75	24	1	12	0	37	4	1	10	3	18	170
07:45 AM	11	25	9	1	46	63	8	11	0	82	4	1	5	0	10	2	0	12	2	16	154
Total	38	79	31	3	151	175	26	24	3	228	32	4	22	0	58	9	1	46	11	67	504
08:00 AM	8	19	7	4	38	26	3	4	0	33	4	2	4	0	10	5	2	17	0	24	105
08:15 AM	6	12	8	1	27	28	5	7	0	40	2	2	2	0	6	1	1	15	2	19	92
08:30 AM	11	15	5	0	31	16	7	7	0	30	1	0	4	0	5	1	1	11	3	16	82
08:45 AM	7	11	9	2	29	33	3	10	0	46	4	0	5	0	9	6	2	19	1	28	112
Total	32	57	29	7	125	103	18	28	0	149	11	4	15	0	30	13	6	62	6	87	391
*** BREAK ***																					
11:00 AM	4	10	2	1	17	15	5	5	0	25	5	0	5	0	10	6	0	20	6	32	84
11:15 AM	9	5	3	1	18	18	14	0	0	32	3	1	6	0	10	6	2	22	1	31	91
11:30 AM	4	6	2	1	13	13	2	3	0	18	7	1	4	0	12	5	1	24	1	31	74
11:45 AM	7	7	7	0	21	10	10	5	0	25	4	1	3	0	8	5	0	14	4	23	77
Total	24	28	14	3	69	56	31	13	0	100	19	3	18	0	40	22	3	80	12	117	326
12:00 PM	2	14	3	3	22	13	10	5	0	28	8	1	9	0	18	5	0	36	2	43	111
12:15 PM	10	10	4	3	27	13	8	4	1	26	5	1	7	0	13	4	1	17	6	28	94
12:30 PM	6	11	5	1	23	11	4	7	0	22	11	1	4	0	16	5	1	16	0	22	83
12:45 PM	8	13	4	1	26	14	13	1	0	28	7	1	6	0	14	2	0	16	0	18	86
Total	26	48	16	8	98	51	35	17	1	104	31	4	26	0	61	16	2	85	8	111	374
*** BREAK ***																					
02:30 PM	4	11	4	0	19	11	11	7	1	30	13	1	6	0	20	6	1	16	1	24	93
02:45 PM	11	13	0	2	26	14	12	14	0	40	10	2	7	0	19	3	1	16	1	21	106
Total	15	24	4	2	45	25	23	21	1	70	23	3	13	0	39	9	2	32	2	45	199
03:00 PM	3	5	2	3	13	7	10	1	0	18	21	1	9	0	31	4	0	11	2	17	79
03:15 PM	7	7	1	4	19	18	15	4	0	37	7	0	10	0	17	5	0	19	1	25	98
03:30 PM	7	12	3	0	22	9	35	5	0	49	26	0	30	0	56	5	0	18	0	23	150
03:45 PM	4	9	3	1	17	15	17	4	0	36	15	0	5	0	20	3	2	23	0	28	101
Total	21	33	9	8	71	49	77	14	0	140	69	1	54	0	124	17	2	71	3	93	428
04:00 PM	7	5	3	0	15	15	13	1	0	29	6	0	8	0	14	3	0	19	3	25	83
04:15 PM	3	3	1	2	9	21	11	3	2	37	15	0	10	0	25	4	0	16	7	27	98
04:30 PM	5	5	3	0	13	15	24	3	0	42	12	0	15	0	27	4	0	16	0	20	102
04:45 PM	3	6	5	0	14	22	7	3	0	32	6	0	14	0	20	1	0	24	0	25	91
Total	18	19	12	2	51	73	55	10	2	140	39	0	47	0	86	12	0	75	10	97	374
05:00 PM	2	4	5	5	16	12	12	4	0	28	10	0	12	0	22	4	0	18	2	24	90
05:15 PM	3	10	6	2	21	16	8	2	0	26	13	0	7	0	20	6	0	25	4	35	102
05:30 PM	4	4	3	4	15	13	10	3	0	26	7	1	7	0	15	3	1	22	1	27	83
05:45 PM	3	5	5	0	13	20	7	1	0	28	4	2	1	0	7	2	0	18	0	20	68
Total	12	23	19	11	65	61	37	10	0	108	34	3	27	0	64	15	1	83	7	106	343
Grand Total	215	369	139	58	781	638	306	178	7	1129	263	23	225	0	511	116	17	562	62	757	3178
Apprch %	27.5	47.2	17.8	7.4		56.5	27.1	15.8	0.6		51.5	4.5	44	0		15.3	2.2	74.2	8.2		
Total %	6.8	11.6	4.4	1.8	24.6	20.1	9.6	5.6	0.2	35.5	8.3	0.7	7.1	0	16.1	3.7	0.5	17.7	2	23.8	
Cars	213	359	138	58	768	634	301	178	7	1120	255	23	221	0	499	116	16	560	62	754	3141
% Cars	99.1	97.3	99.3	100	98.3	99.4	98.4	100	100	99.2	97	100	98.2	0	97.7	100	94.1	99.6	100	99.6	98.8
Trucks	2	10	1	0	13	4	5	0	0	9	8	0	4	0	12	0	1	2	0	3	37
% Trucks	0.9	2.7	0.7	0	1.7	0.6	1.6	0	0	0.8	3	0	1.8	0	2.3	0	5.9	0.4	0	0.4	1.2

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Genesys Parkway Eastbound					Genesys Parkway Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	7	25	8	0	40	45	1	5	0	51	3	1	4	0	8	2	0	16	3	21	120
07:30 AM	10	19	10	1	40	55	14	5	1	75	24	1	12	0	37	4	1	10	3	18	170
07:45 AM	11	25	9	1	46	63	8	11	0	82	4	1	5	0	10	2	0	12	2	16	154
08:00 AM	8	19	7	4	38	26	3	4	0	33	4	2	4	0	10	5	2	17	0	24	105
Total Volume	36	88	34	6	164	189	26	25	1	241	35	5	25	0	65	13	3	55	8	79	549
% App. Total	22	53.7	20.7	3.7		78.4	10.8	10.4	0.4		53.8	7.7	38.5	0		16.5	3.8	69.6	10.1		
PHF	.818	.880	.850	.375	.891	.750	.464	.568	.250	.735	.365	.625	.521	.000	.439	.650	.375	.809	.667	.823	.807
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	2	14	3	3	22	13	10	5	0	28	8	1	9	0	18	5	0	36	2	43	111
12:15 PM	10	10	4	3	27	13	8	4	1	26	5	1	7	0	13	4	1	17	6	28	94
12:30 PM	6	11	5	1	23	11	4	7	0	22	11	1	4	0	16	5	1	16	0	22	83
12:45 PM	8	13	4	1	26	14	13	1	0	28	7	1	6	0	14	2	0	16	0	18	86
Total Volume																					
% App. Total	26.5	49	16.3	8.2		49	33.7	16.3	1		50.8	6.6	42.6	0		14.4	1.8	76.6	7.2		
PHF	.650	.857	.800	.667	.907	.911	.673	.607	.250	.929	.705	1.000	.722	.000	.847	.800	.500	.590	.333	.645	.842
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	11	13	0	2	26	14	12	14	0	40	10	2	7	0	19	3	1	16	1	21	106
03:00 PM	3	5	2	3	13	7	10	1	0	18	21	1	9	0	31	4	0	11	2	17	79
03:15 PM	7	7	1	4	19	18	15	4	0	37	7	0	10	0	17	5	0	19	1	25	98
03:30 PM	7	12	3	0	22	9	35	5	0	49	26	0	30	0	56	5	0	18	0	23	150
Total Volume	28	37	6	9	80	48	72	24	0	144	64	3	56	0	123	17	1	64	4	86	433
% App. Total	35	46.2	7.5	11.2		33.3	50	16.7	0		52	2.4	45.5	0		19.8	1.2	74.4	4.7		
PHF	.636	.712	.500	.563	.769	.667	.514	.429	.000	.735	.615	.375	.467	.000	.549	.850	.250	.842	.500	.860	.722

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: MSP
Comments: One u-turn around end of boule
Incidents: None

File Name : 1018 Genesys & Health Park 08-06-2015
Site Code : 10180001
Start Date : 08-06-2015
Page No : 1

Groups Printed- Cars - Trucks

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Genesys Parkway Eastbound					Genesys Parkway Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	18	6	11	0	35	3	8	3	0	14	2	13	3	0	18	35	28	2	0	65	132
06:45 AM	13	15	20	0	48	7	13	7	0	27	0	6	0	0	6	38	45	0	0	83	164
Total	31	21	31	0	83	10	21	10	0	41	2	19	3	0	24	73	73	2	0	148	296
07:00 AM	8	7	14	0	29	2	5	1	0	8	1	4	1	4	10	15	19	5	0	39	86
07:15 AM	10	10	13	0	33	3	5	3	0	11	1	7	2	1	11	20	17	0	0	37	92
07:30 AM	10	7	38	0	55	19	8	3	0	30	0	65	6	0	71	23	33	0	0	56	212
07:45 AM	7	9	17	0	33	14	10	10	0	34	1	19	4	0	24	26	45	5	0	76	167
Total	35	33	82	0	150	38	28	17	0	83	3	95	13	5	116	84	114	10	0	208	557
08:00 AM	3	16	15	0	34	5	7	5	0	17	1	20	2	0	23	22	27	2	0	51	125
08:15 AM	5	9	16	1	31	10	11	3	0	24	0	13	5	0	18	25	19	2	0	46	119
08:30 AM	10	12	14	0	36	10	7	3	0	20	1	16	3	0	20	25	20	4	1	50	126
08:45 AM	8	4	19	0	31	10	10	8	0	28	1	22	2	0	25	31	30	1	0	62	146
Total	26	41	64	1	132	35	35	19	0	89	3	71	12	0	86	103	96	9	1	209	516
*** BREAK ***																					
11:00 AM	3	3	25	0	31	12	9	4	0	25	1	30	3	0	34	17	21	1	0	39	129
11:15 AM	2	5	32	2	41	14	7	7	0	28	1	28	0	0	29	15	27	1	0	43	141
11:30 AM	3	5	44	0	52	19	8	2	0	29	0	31	2	0	33	12	28	4	0	44	158
11:45 AM	5	6	36	0	47	9	9	4	0	22	0	34	5	0	39	14	20	1	0	35	143
Total	13	19	137	2	171	54	33	17	0	104	2	123	10	0	135	58	96	7	0	161	571
12:00 PM	2	8	28	0	38	20	5	2	0	27	3	39	1	0	43	17	22	0	0	39	147
12:15 PM	3	5	23	0	31	22	8	6	0	36	2	35	3	0	40	15	28	2	0	45	152
12:30 PM	5	2	16	0	23	18	2	2	0	22	1	33	1	0	35	13	15	3	0	31	111
12:45 PM	3	7	24	0	34	13	6	6	0	25	3	34	5	0	42	23	35	3	0	61	162
Total	13	22	91	0	126	73	21	16	0	110	9	141	10	0	160	68	100	8	0	176	572
*** BREAK ***																					
02:30 PM	5	4	42	0	51	28	11	6	0	45	2	45	9	0	56	20	26	2	0	48	200
02:45 PM	2	7	30	0	39	20	13	6	0	39	1	42	4	0	47	22	22	3	1	48	173
Total	7	11	72	0	90	48	24	12	0	84	3	87	13	0	103	42	48	5	1	96	373
03:00 PM	3	7	31	0	41	18	9	5	0	32	1	58	8	0	67	20	29	1	1	51	191
03:15 PM	1	2	16	0	19	14	12	0	0	26	4	45	8	0	57	18	26	1	0	45	147
03:30 PM	2	6	65	0	73	49	20	2	0	71	4	96	25	0	125	11	21	1	0	33	302
03:45 PM	2	1	30	1	34	24	11	1	0	36	0	60	12	0	72	19	19	2	0	40	182
Total	8	16	142	1	167	105	52	8	0	165	9	259	53	0	321	68	95	5	1	169	822
04:00 PM	5	1	42	0	48	31	12	7	0	50	1	45	7	0	53	14	16	1	0	31	182
04:15 PM	3	6	26	0	35	22	7	3	0	32	4	49	5	0	58	28	14	1	0	43	168
04:30 PM	1	8	39	0	48	25	5	4	0	34	4	64	9	0	77	26	17	0	0	43	202
04:45 PM	7	3	38	0	48	22	11	0	0	33	5	43	9	0	57	32	16	3	0	51	189
Total	16	18	145	0	179	100	35	14	0	149	14	201	30	0	245	100	63	5	0	168	741
05:00 PM	3	3	32	0	38	43	11	5	0	59	2	48	5	0	55	22	13	0	0	35	187
05:15 PM	2	4	27	0	33	12	6	1	0	19	1	35	8	0	44	26	22	1	0	49	145
05:30 PM	1	2	26	0	29	13	6	3	0	22	0	41	7	0	48	11	26	0	0	37	136
05:45 PM	2	3	28	0	33	7	6	3	0	16	1	30	3	0	34	22	12	2	0	36	119
Total	8	12	113	0	133	75	29	12	0	116	4	154	23	0	181	81	73	3	0	157	587
Grand Total	157	193	877	4	1231	538	278	125	0	941	49	1150	167	5	1371	677	758	54	3	1492	5035
Apprch %	12.8	15.7	71.2	0.3		57.2	29.5	13.3	0		3.6	83.9	12.2	0.4		45.4	50.8	3.6	0.2		
Total %	3.1	3.8	17.4	0.1	24.4	10.7	5.5	2.5	0	18.7	1	22.8	3.3	0.1	27.2	13.4	15.1	1.1	0.1	29.6	
Cars	154	184	857	4	1199	530	271	116	0	917	49	1141									
% Cars	98.1	95.3	97.7	100	97.4	98.5	97.5	92.8	0	97.4	100	99.2	97.6	100	99.1	99	99.2	100	100	99.1	98.4
Trucks	3	9	20	0	32	8	7	9	0	24	0	9	4	0	13	7	6	0	0	13	82
% Trucks	1.9	4.7	2.3	0	2.6	1.5	2.5	7.2	0	2.6	0	0.8	2.4	0	0.9	1	0.8	0	0	0.9	1.6

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Genesys Parkway Eastbound					Genesys Parkway Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	10	7	38	0	55	19	8	3	0	30	0	65	6	0	71	23	33	0	0	56	212
07:45 AM	7	9	17	0	33	14	10	10	0	34	1	19	4	0	24	26	45	5	0	76	167
08:00 AM	3	16	15	0	34	5	7	5	0	17	1	20	2	0	23	22	27	2	0	51	125
08:15 AM	5	9	16	1	31	10	11	3	0	24	0	13	5	0	18	25	19	2	0	46	119
Total Volume	25	41	86	1	153	48	36	21	0	105	2	117	17	0	136	96	124	9	0	229	623
% App. Total	16.3	26.8	56.2	0.7		45.7	34.3	20	0		1.5	86	12.5	0		41.9	54.1	3.9	0		
PHF	.625	.641	.566	.250	.695	.632	.818	.525	.000	.772	.500	.450	.708	.000	.479	.923	.689	.450	.000	.753	.735
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	3	5	44	0	52	19	8	2	0	29	0	31	2	0	33	12	28	4	0	44	158
11:45 AM	5	6	36	0	47	9	9	4	0	22	0	34	5	0	39	14	20	1	0	35	143
12:00 PM	2	8	28	0	38	20	5	2	0	27	3	39	1	0	43	17	22	0	0	39	147
12:15 PM	3	5	23	0	31	22	8	6	0	36	2	35	3	0	40	15	28	2	0	45	152
Total Volume																					
% App. Total	7.7	14.3	78	0		61.4	26.3	12.3	0		3.2	89.7	7.1	0		35.6	60.1	4.3	0		
PHF	.650	.750	.744	.000	.808	.795	.833	.583	.000	.792	.417	.891	.550	.000	.901	.853	.875	.438	.000	.906	.949
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	2	6	65	0	73	49	20	2	0	71	4	96	25	0	125	11	21	1	0	33	302
03:45 PM	2	1	30	1	34	24	11	1	0	36	0	60	12	0	72	19	19	2	0	40	182
04:00 PM	5	1	42	0	48	31	12	7	0	50	1	45	7	0	53	14	16	1	0	31	182
04:15 PM	3	6	26	0	35	22	7	3	0	32	4	49	5	0	58	28	14	1	0	43	168
Total Volume	12	14	163	1	190	126	50	13	0	189	9	250	49	0	308	72	70	5	0	147	834
% App. Total	6.3	7.4	85.8	0.5		66.7	26.5	6.9	0		2.9	81.2	15.9	0		49	47.6	3.4	0		
PHF	.600	.583	.627	.250	.651	.643	.625	.464	.000	.665	.563	.651	.490	.000	.616	.643	.833	.625	.000	.855	.690

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: LMM
Comments: 10% +/- of cars on Pollock ra
Incidents: None

File Name : 1019 Pollock & Health Park 08-06-2015
Site Code : 10190002
Start Date : 08-06-2015
Page No : 1

Groups Printed- Cars - Trucks

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Pollock Road Eastbound					Pollock Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	7	3	1	0	11	1	0	1	0	2	0	3	6	0	9	9	73	8	0	90	112
06:45 AM	9	6	0	0	15	1	3	1	0	5	1	0	5	0	6	20	79	19	0	118	144
Total	16	9	1	0	26	2	3	2	0	7	1	3	11	0	15	29	152	27	0	208	256
07:00 AM	5	5	3	0	13	0	1	0	0	1	1	4	1	4	10	6	37	13	0	56	80
07:15 AM	3	7	2	0	12	1	2	0	0	3	1	0	4	0	5	5	34	14	0	53	73
07:30 AM	2	4	0	1	7	0	1	0	0	1	0	6	24	0	30	8	41	14	0	63	101
07:45 AM	6	7	1	0	14	2	4	2	0	8	2	8	12	0	22	19	40	23	0	82	126
Total	16	23	6	1	46	3	8	2	0	13	4	18	41	4	67	38	152	64	0	254	380
08:00 AM	8	8	5	0	21	3	3	0	0	6	1	5	6	0	12	9	23	12	0	44	83
08:15 AM	5	5	1	2	13	0	6	1	0	7	3	2	8	0	13	11	36	15	0	62	95
08:30 AM	6	6	4	0	16	1	9	1	0	11	3	6	5	1	15	9	14	10	0	33	75
08:45 AM	0	2	3	0	5	3	9	2	0	14	1	5	6	0	12	18	29	10	0	57	88
Total	19	21	13	2	55	7	27	4	0	38	8	18	25	1	52	47	102	47	0	196	341
*** BREAK ***																					
11:00 AM	1	2	2	0	5	5	8	0	0	13	0	2	6	0	8	12	8	7	0	27	53
11:15 AM	1	3	3	0	7	7	12	1	0	20	0	5	6	1	12	10	8	6	0	24	63
11:30 AM	1	5	3	0	9	7	13	4	0	24	0	5	7	0	12	8	15	6	0	29	74
11:45 AM	2	2	3	0	7	7	10	2	0	19	1	4	3	0	8	9	12	12	0	33	67
Total	5	12	11	0	28	26	43	7	0	76	1	16	22	1	40	39	43	31	0	113	257
12:00 PM	2	3	5	0	10	6	14	1	0	21	1	11	4	0	16	10	14	7	0	31	78
12:15 PM	1	6	2	0	9	9	17	4	0	30	2	7	2	0	11	18	7	14	0	39	89
12:30 PM	1	4	1	0	6	7	8	1	0	16	2	5	7	3	17	7	10	8	0	25	64
12:45 PM	2	9	3	0	14	3	7	0	0	10	5	3	6	3	17	11	16	13	0	40	81
Total	6	22	11	0	39	25	46	6	0	77	10	26	19	6	61	46	47	42	0	135	312
*** BREAK ***																					
02:30 PM	3	2	4	0	9	3	10	1	0	14	0	3	21	0	24	15	30	4	0	49	96
02:45 PM	3	3	4	0	10	8	11	2	0	21	1	7	14	0	22	14	32	6	1	53	106
Total	6	5	8	0	19	11	21	3	0	35	1	10	35	0	46	29	62	10	1	102	202
03:00 PM	3	1	5	1	10	3	11	2	0	16	1	5	7	0	13	14	17	2	0	33	72
03:15 PM	2	1	4	0	7	6	10	0	0	16	0	7	11	0	18	5	11	2	0	18	59
03:30 PM	1	1	8	0	10	3	16	0	0	19	0	8	44	0	52	14	9	7	0	30	111
03:45 PM	2	0	1	0	3	2	14	0	0	16	0	4	11	0	15	10	4	3	0	17	51
Total	8	3	18	1	30	14	51	2	0	67	1	24	73	0	98	43	41	14	0	98	293
04:00 PM	1	0	1	0	2	5	19	3	0	27	0	4	10	0	14	19	4	5	0	28	71
04:15 PM	3	3	4	0	10	3	14	0	0	17	0	8	11	0	19	6	16	5	0	27	73
04:30 PM	5	2	4	0	11	3	9	0	0	12	0	15	18	0	33	8	11	1	0	20	76
04:45 PM	3	0	2	0	5	2	10	0	0	12	3	6	12	0	21	15	13	1	0	29	67
Total	12	5	11	0	28	13	52	3	0	68	3	33	51	0	87	48	44	12	0	104	287
05:00 PM	1	1	1	0	3	1	17	1	0	19	0	6	18	0	24	25	11	3	0	39	85
05:15 PM	0	1	3	0	4	0	3	0	0	3	0	7	8	0	15	9	14	3	0	26	48
05:30 PM	0	0	1	0	1	2	2	0	0	4	0	8	11	0	19	9	14	1	0	24	48
05:45 PM	3	0	2	0	5	1	1	0	0	2	0	6	7	0	13	9	15	1	0	25	45
Total	4	2	7	0	13	4	23	1	0	28	0	27	44	0	71	52	54	8	0	114	226
Grand Total	92	102	86	4	284	105	274	30	0	409	29	175	321	12	537	371	697	255	1	1324	2554
Apprch %	32.4	35.9	30.3	1.4		25.7	67	7.3	0		5.4	32.6	59.8	2.2		28	52.6	19.3	0.1		
Total %	3.6	4	3.4	0.2	11.1	4.1	10.7	1.2	0	16	1.1	6.9	12.6	0.5	21	14.5	27.3	10	0	51.8	
Cars	91	98	85	4	278	102	268	29	0	399	27	174	318	12	531	355	692	252	1	1300	2508
% Cars	98.9	96.1	98.8	100	97.9	97.1	97.8	96.7	0	97.6	93.1	99.4	99.1	100	98.9	95.7	99.3	98.8	100	98.2	98.2
Trucks	1	4	1	0	6	3	6	1	0	10	2	1	3	0	6	16	5	3	0	24	46
% Trucks	1.1	3.9	1.2	0	2.1	2.9	2.2	3.3	0	2.4	6.9	0.6	0.9	0	1.1	4.3	0.7	1.2	0	1.8	1.8

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Health Park Boulevard Northbound					Health Park Boulevard Southbound					Pollock Road Eastbound					Pollock Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:30 AM																					
06:30 AM	7	3	1	0	11	1	0	1	0	2	0	3	6	0	9	9	73	8	0	90	112
06:45 AM	9	6	0	0	15	1	3	1	0	5	1	0	5	0	6	20	79	19	0	118	144
07:00 AM	5	5	3	0	13	0	1	0	0	1	1	4	1	4	10	6	37	13	0	56	80
07:15 AM	3	7	2	0	12	1	2	0	0	3	1	0	4	0	5	5	34	14	0	53	73
Total Volume	24	21	6	0	51	3	6	2	0	11	3	7	16	4	30	40	223	54	0	317	409
% App. Total	47.1	41.2	11.8	0		27.3	54.5	18.2	0		10	23.3	53.3	13.3		12.6	70.3	17	0		
PHF	.667	.750	.500	.000	.850	.750	.500	.500	.000	.550	.750	.438	.667	.250	.750	.500	.706	.711	.000	.672	.710
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	2	3	5	0	10	6	14	1	0	21	1	11	4	0	16	10	14	7	0	31	78
12:15 PM	1	6	2	0	9	9	17	4	0	30	2	7	2	0	11	18	7	14	0	39	89
12:30 PM	1	4	1	0	6	7	8	1	0	16	2	5	7	3	17	7	10	8	0	25	64
12:45 PM	2	9	3	0	14	3	7	0	0	10	5	3	6	3	17	11	16	13	0	40	81
Total Volume																					
% App. Total	15.4	56.4	28.2	0		32.5	59.7	7.8	0		16.4	42.6	31.1	9.8		34.1	34.8	31.1	0		
PHF	.750	.611	.550	.000	.696	.694	.676	.375	.000	.642	.500	.591	.679	.500	.897	.639	.734	.750	.000	.844	.876
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	3	3	4	0	10	8	11	2	0	21	1	7	14	0	22	14	32	6	1	53	106
03:00 PM	3	1	5	1	10	3	11	2	0	16	1	5	7	0	13	14	17	2	0	33	72
03:15 PM	2	1	4	0	7	6	10	0	0	16	0	7	11	0	18	5	11	2	0	18	59
03:30 PM	1	1	8	0	10	3	16	0	0	19	0	8	44	0	52	14	9	7	0	30	111
Total Volume	9	6	21	1	37	20	48	4	0	72	2	27	76	0	105	47	69	17	1	134	348
% App. Total	24.3	16.2	56.8	2.7		27.8	66.7	5.6	0		1.9	25.7	72.4	0		35.1	51.5	12.7	0.7		
PHF	.750	.500	.656	.250	.925	.625	.750	.500	.000	.857	.500	.844	.432	.000	.505	.839	.539	.607	.250	.632	.784

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Clear
Collected By: PRH
Comments: None
Incidents: None

File Name : 1020 Pollock & Employee Parking 08-05-2015
Site Code : 10200001
Start Date : 08-05-2015
Page No : 1

Groups Printed- Cars - Trucks

	Employee Parking Northbound					Employee Parking Southbound					Pollock Road Eastbound					Pollock Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	0	1	2	0	3	1	0	1	1	3	4	13	4	34	55	43	3	51	0	97	158
06:45 AM	0	0	0	0	0	3	0	0	0	3	8	9	10	51	78	49	1	56	0	106	187
Total	0	1	2	0	3	4	0	1	1	6	12	22	14	85	133	92	4	107	0	203	345
07:00 AM	0	3	2	0	5	1	0	0	0	1	0	3	0	22	25	16	2	14	0	32	63
07:15 AM	0	1	2	0	3	3	0	0	0	3	0	6	1	18	25	12	3	18	0	33	64
07:30 AM	4	1	6	0	11	26	6	3	0	35	2	7	1	40	50	35	2	19	0	56	152
07:45 AM	1	5	3	0	9	2	4	0	0	6	1	7	5	44	57	22	4	24	0	50	122
Total	5	10	13	0	28	32	10	3	0	45	3	23	7	124	157	85	11	75	0	171	401
08:00 AM	1	2	2	0	5	1	2	0	0	3	0	12	1	13	26	14	4	14	0	32	66
08:15 AM	0	2	4	0	6	2	0	0	0	2	1	11	0	17	29	9	3	12	0	24	61
08:30 AM	0	2	1	0	3	1	2	0	0	3	2	8	1	14	25	7	3	17	0	27	58
08:45 AM	1	3	3	0	7	0	2	0	0	2	0	6	2	14	22	12	4	7	0	23	54
Total	2	9	10	0	21	4	6	0	0	10	3	37	4	58	102	42	14	50	0	106	239
*** BREAK ***																					
11:00 AM	0	0	4	1	5	1	0	0	0	1	0	5	1	2	8	6	7	0	0	13	27
11:15 AM	0	0	2	0	2	1	1	0	3	5	0	5	0	4	9	4	5	2	0	11	27
11:30 AM	1	1	4	0	6	6	4	1	0	11	0	6	1	5	12	6	10	3	0	19	48
11:45 AM	0	0	3	0	3	1	2	0	2	5	0	4	1	6	11	7	5	2	0	14	33
Total	1	1	13	1	16	9	7	1	5	22	0	20	3	17	40	23	27	7	0	57	135
12:00 PM	1	1	4	1	7	3	1	1	3	8	0	5	1	7	13	6	4	1	0	11	39
12:15 PM	4	0	2	0	6	4	4	0	3	11	1	8	1	11	21	5	5	3	0	13	51
12:30 PM	1	3	2	0	6	2	0	0	0	2	0	3	3	6	12	6	5	7	0	18	38
12:45 PM	2	0	5	0	7	3	0	0	1	4	1	4	4	8	17	5	6	2	2	15	43
Total	8	4	13	1	26	12	5	1	7	25	2	20	9	32	63	22	20	13	2	57	171
*** BREAK ***																					
02:30 PM	2	0	0	0	2	16	3	0	5	24	1	2	0	24	27	19	4	10	0	33	86
02:45 PM	7	3	7	0	17	6	2	0	2	10	1	4	4	16	25	11	3	21	0	35	87
Total	9	3	7	0	19	22	5	0	7	34	2	6	4	40	52	30	7	31	0	68	173
03:00 PM	2	2	1	0	5	12	7	3	4	26	0	4	0	19	23	3	8	5	0	16	70
03:15 PM	7	0	5	0	12	5	1	6	2	14	0	8	1	7	16	5	6	4	0	15	57
03:30 PM	11	1	9	0	21	48	17	8	6	79	0	1	1	39	41	4	10	1	0	15	156
03:45 PM	2	0	2	1	5	13	10	1	6	30	0	2	0	14	16	2	7	4	0	13	64
Total	22	3	17	1	43	78	35	18	18	149	0	15	2	79	96	14	31	14	0	59	347
04:00 PM	1	1	0	0	2	8	10	1	5	24	0	4	0	10	14	2	8	1	1	12	52
04:15 PM	1	0	2	0	3	3	5	2	4	14	0	6	1	10	17	7	15	0	0	22	56
04:30 PM	6	1	5	0	12	24	15	3	10	52	0	5	1	28	34	1	9	2	0	12	110
04:45 PM	0	0	2	0	2	15	3	2	6	26	0	4	1	9	14	4	5	0	2	11	53
Total	8	2	9	0	19	50	33	8	25	116	0	19	3	57	79	14	37	3	3	57	271
05:00 PM	2	0	3	0	5	9	6	0	6	21	0	6	1	11	18	2	8	0	0	10	54
05:15 PM	1	0	4	0	5	8	5	0	4	17	0	5	0	11	16	3	19	1	0	23	61
05:30 PM	1	1	1	0	3	16	5	1	3	25	0	7	0	13	20	5	6	0	0	11	59
05:45 PM	0	0	0	0	0	4	3	1	2	10	0	5	0	5	10	9	5	1	1	16	36
Total	4	1	8	0	13	37	19	2	15	73	0	23	1	40	64	19	38	2	1	60	210
Grand Total	59	34	92	3	188	248	120	34	78	480	22	185	47	532	786	341	189	302	6	838	2292
Apprch %	31.4	18.1	48.9	1.6		51.7	25	7.1	16.2		2.8	23.5	6	67.7		40.7	22.6	36	0.7		
Total %	2.6	1.5	4	0.1	8.2	10.8	5.2	1.5	3.4	20.9	1	8.1	2.1	23.2	34.3	14.9	8.2	13.2	0.3	36.6	
Cars	58	34	90	3	185	248	120	34	78	480	22	182	45	532	781	335	185	302	6	828	2274
% Cars	98.3	100	97.8	100	98.4	100	100	100	100	100	100	98.4	95.7	100	99.4	98.2	97.9	100	100	98.8	99.2
Trucks	1	0	2	0	3	0	0	0	0	0	0	3	2	0	5	6	4	0	0	10	18
% Trucks	1.7	0	2.2	0	1.6	0	0	0	0	0	0	1.6	4.3	0	0.6	1.8	2.1	0	0	1.2	0.8

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

	Employee Parking Northbound					Employee Parking Southbound					Pollock Road Eastbound					Pollock Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:30 AM																					
06:30 AM	0	1	2	0	3	1	0	1	1	3	4	13	4	34	55	43	3	51	0	97	158
06:45 AM	0	0	0	0	0	3	0	0	0	3	8	9	10	51	78	49	1	56	0	106	187
07:00 AM	0	3	2	0	5	1	0	0	0	1	0	3	0	22	25	16	2	14	0	32	63
07:15 AM	0	1	2	0	3	3	0	0	0	3	0	6	1	18	25	12	3	18	0	33	64
Total Volume	0	5	6	0	11	8	0	1	1	10	12	31	15	125	183	120	9	139	0	268	472
% App. Total	0	45.5	54.5	0		80	0	10	10		6.6	16.9	8.2	68.3		44.8	3.4	51.9	0		
PHF	.000	.417	.750	.000	.550	.667	.000	.250	.250	.833	.375	.596	.375	.613	.587	.612	.750	.621	.000	.632	.631
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	1	1	4	0	6	6	4	1	0	11	0	6	1	5	12	6	10	3	0	19	48
11:45 AM	0	0	3	0	3	1	2	0	2	5	0	4	1	6	11	7	5	2	0	14	33
12:00 PM	1	1	4	1	7	3	1	1	3	8	0	5	1	7	13	6	4	1	0	11	39
12:15 PM	4	0	2	0	6	4	4	0	3	11	1	8	1	11	21	5	5	3	0	13	51
Total Volume																					
% App. Total	27.3	9.1	59.1	4.5		40	31.4	5.7	22.9		1.8	40.4	7	50.9		42.1	42.1	15.8	0		
PHF	.375	.500	.813	.250	.786	.583	.688	.500	.667	.795	.250	.719	1.00	.659	.679	.857	.600	.750	.000	.750	.838
Peak Hour Analysis From 02:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	7	3	7	0	17	6	2	0	2	10	1	4	4	16	25	11	3	21	0	35	87
03:00 PM	2	2	1	0	5	12	7	3	4	26	0	4	0	19	23	3	8	5	0	16	70
03:15 PM	7	0	5	0	12	5	1	6	2	14	0	8	1	7	16	5	6	4	0	15	57
03:30 PM	11	1	9	0	21	48	17	8	6	79	0	1	1	39	41	4	10	1	0	15	156
Total Volume	27	6	22	0	55	71	27	17	14	129	1	17	6	81	105	23	27	31	0	81	370
% App. Total	49.1	10.9	40	0		55	20.9	13.2	10.9		1	16.2	5.7	77.1		28.4	33.3	38.3	0		
PHF	.614	.500	.611	.000	.655	.370	.397	.531	.583	.408	.250	.531	.375	.519	.640	.523	.675	.369	.000	.579	.593

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Project No. RWS 2001-01F
Dort Highway Extension
Genesee County
Count During School Day

File Name : 1021 School Dort & Grand Blanc AM & PM 09-23-2015
Site Code : 10210001
Start Date : 09-23-2015
Page No : 1

Groups Printed- Cars - Trucks

	M-54 (Dort Hwy) Northbound					M-54 (Dort Hwy) Southbound					Grand Blanc Road Eastbound					Grand Blanc Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	7	31	14	0	52	14	81	21	0	116	21	49	49	0	119	48	31	10	0	89	376
06:45 AM	6	49	31	0	86	25	72	10	0	107	21	85	52	0	158	46	31	9	0	86	437
Total	13	80	45	0	138	39	153	31	0	223	42	134	101	0	277	94	62	19	0	175	813
07:00 AM	5	29	33	0	67	21	62	16	0	99	13	58	59	0	130	58	59	16	0	133	429
07:15 AM	14	46	26	0	86	18	61	14	0	93	28	53	31	0	112	71	47	21	0	139	430
07:30 AM	29	48	46	0	123	20	66	19	0	105	33	69	63	0	165	73	51	40	0	164	557
07:45 AM	25	61	40	0	126	22	68	23	0	113	49	68	45	0	162	72	59	35	0	166	567
Total	73	184	145	0	402	81	257	72	0	410	123	248	198	0	569	274	216	112	0	602	1983
08:00 AM	10	51	23	0	84	18	73	20	0	111	38	66	52	0	156	71	53	26	0	150	501
08:15 AM	20	54	25	0	99	11	64	21	0	96	35	53	38	0	126	40	34	30	0	104	425
08:30 AM	12	42	21	0	75	21	57	16	0	94	27	53	26	0	106	61	57	25	0	143	418
08:45 AM	22	44	22	0	88	18	46	17	0	81	28	50	27	0	105	32	40	17	0	89	363
Total	64	191	91	0	346	68	240	74	0	382	128	222	143	0	493	204	184	98	0	486	1707
*** BREAK ***																					
02:30 PM	18	62	14	0	94	24	83	49	0	156	21	71	39	0	131	28	52	31	1	112	493
02:45 PM	30	68	16	0	114	31	68	43	1	143	32	60	42	1	135	39	49	30	1	119	511
Total	48	130	30	0	208	55	151	92	1	299	53	131	81	1	266	67	101	61	2	231	1004
03:00 PM	28	61	10	0	99	40	79	49	1	169	27	68	54	3	152	34	47	24	3	108	528
03:15 PM	24	63	9	2	98	20	67	24	0	111	31	77	52	0	160	37	57	36	13	143	512
03:30 PM	39	75	6	0	120	40	78	33	0	151	52	97	52	0	201	44	44	41	0	129	601
03:45 PM	28	74	15	0	117	35	85	46	0	166	45	88	63	0	196	45	56	41	3	145	624
Total	119	273	40	2	434	135	309	152	1	597	155	330	221	3	709	160	204	142	19	525	2265
04:00 PM	32	77	17	0	126	36	90	51	0	177	37	98	61	0	196	52	56	44	1	153	652
04:15 PM	30	58	12	0	100	23	73	39	0	135	45	86	64	0	195	43	47	41	1	132	562
04:30 PM	23	49	20	2	94	32	73	35	0	140	39	98	64	0	201	48	48	31	2	129	564
04:45 PM	30	92	14	0	136	26	75	35	0	136	47	99	69	0	215	42	47	52	1	142	629
Total	115	276	63	2	456	117	311	160	0	588	168	381	258	0	807	185	198	168	5	556	2407
Grand Total	432	1134	414	4	1984	495	1421	581	2	2499	669	1446	1002	4	3121	984	965	600	26	2575	10179
Apprch %	21.8	57.2	20.9	0.2		19.8	56.9	23.2	0.1		21.4	46.3	32.1	0.1		38.2	37.5	23.3	1		
Total %	4.2	11.1	4.1	0	19.5	4.9	14	5.7	0	24.6	6.6	14.2	9.8	0	30.7	9.7	9.5	5.9	0.3	25.3	
Cars	415	1064					1355					1379									
% Cars	96.1	93.8	95.7	75	94.7	97	95.4	92.9	100	95.1	96.1	95.4	98.3	100	96.5	98.6	94.1	96.2	100	96.3	95.8
Trucks	17	70	18	1	106	15	66	41	0	122	26	67	17	0	110	14	57	23	0	94	432
% Trucks	3.9	6.2	4.3	25	5.3	3	4.6	7.1	0	4.9	3.9	4.6	1.7	0	3.5	1.4	5.9	3.8	0	3.7	4.2

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Project No. RWS 2001-01F
Dort Highway Extension
Genesee County
Count During School Day

File Name : 1021 School Dort & Grand Blanc AM & PM 09-23-2015
Site Code : 10210001
Start Date : 09-23-2015
Page No : 2

	M-54 (Dort Hwy) Northbound					M-54 (Dort Hwy) Southbound					Grand Blanc Road Eastbound					Grand Blanc Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	14	46	26	0	86	18	61	14	0	93	28	53	31	0	112	71	47	21	0	139	430
07:30 AM	29	48	46	0	123	20	66	19	0	105	33	69	63	0	165	73	51	40	0	164	557
07:45 AM	25	61	40	0	126	22	68	23	0	113	49	68	45	0	162	72	59	35	0	166	567
08:00 AM	10	51	23	0	84	18	73	20	0	111	38	66	52	0	156	71	53	26	0	150	501
Total Volume	78	206	135	0	419	78	268	76	0	422	148	256	191	0	595	287	210	122	0	619	2055
% App. Total	18.6	49.2	32.2	0		18.5	63.5	18	0		24.9	43	32.1	0		46.4	33.9	19.7	0		
PHF	.672	.844	.734	.000	.831	.886	.918	.826	.000	.934	.755	.928	.758	.000	.902	.983	.890	.763	.000	.932	.906
Peak Hour Analysis From 02:30 PM to 04:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	39	75	6	0	120	40	78	33	0	151	52	97	52	0	201	44	44	41	0	129	601
03:45 PM	28	74	15	0	117	35	85	46	0	166	45	88	63	0	196	45	56	41	3	145	624
04:00 PM	32	77	17	0	126	36	90	51	0	177	37	98	61	0	196	52	56	44	1	153	652
04:15 PM	30	58	12	0	100	23	73	39	0	135	45	86	64	0	195	43	47	41	1	132	562
Total Volume																					
% App. Total	27.9	61.3	10.8	0		21.3	51.8	26.9	0		22.7	46.8	30.5	0		32.9	36.3	29.9	0.9		
PHF	.827	.922	.735	.000	.919	.838	.906	.828	.000	.888	.861	.941	.938	.000	.980	.885	.906	.949	.417	.913	.935

Wade Trim Associates, Inc.
25251 Northline Road
Taylor, Michigan 48184
734 947-9700

Weather: Sunny
Collected By: Kraft Engineering - MSP
Comments: None
Incidents: None

File Name : 1002 Baldwin & McWain 07-08-2015
Site Code : 10020001
Start Date : 07-08-2015
Page No : 2

	McWain Road Northbound					McWain Road Southbound					Baldwin Road Eastbound					Baldwin Road Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	0	2	0	3	0	0	2	0	2	1	96	0	0	97	0	88	0	0	88	190
07:45 AM	1	1	2	0	4	1	0	1	1	3	2	142	0	1	145	0	82	1	0	83	235
08:00 AM	0	0	0	1	1	0	0	3	0	3	1	110	0	0	111	1	53	0	0	54	169
08:15 AM	1	0	2	0	3	1	0	0	2	3	0	124	0	0	124	0	60	0	0	60	190
Total Volume	3	1	6	1	11	2	0	6	3	11	4	472	0	1	477	1	283	1	0	285	784
% App. Total	27.3	9.1	54.5	9.1		18.2	0	54.5	27.3		0.8	99	0	0.2		0.4	99.3	0.4	0		
PHF	.750	.250	.750	.250	.688	.500	.000	.500	.375	.917	.500	.831	.000	.250	.822	.250	.804	.250	.000	.810	.834
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	1	1	0	0	2	0	1	1	0	2	0	59	8	0	67	0	81	2	0	83	154
12:15 PM	0	3	0	0	3	1	1	2	0	4	0	60	2	0	62	0	62	1	0	63	132
12:30 PM	3	0	1	0	4	1	0	1	0	2	1	65	1	0	67	0	81	4	0	85	158
12:45 PM	0	0	3	0	3	0	0	2	0	2	2	88	2	0	92	0	66	1	0	67	164
Total Volume																					
% App. Total	33.3	33.3	33.3	0		20	20	60	0		1	94.4	4.5	0		0	97.3	2.7	0		
PHF	.333	.333	.333	.000	.750	.500	.500	.750	.000	.625	.375	.773	.406	.000	.783	.000	.895	.500	.000	.876	.927
Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	1	1	1	0	3	3	2	4	1	10	1	82	1	0	84	2	155	0	0	157	254
04:45 PM	0	0	1	0	1	0	2	4	0	6	5	89	0	0	94	0	113	2	0	115	216
05:00 PM	0	2	1	0	3	1	0	3	0	4	4	79	3	0	86	4	182	1	0	187	280
05:15 PM	0	1	2	0	3	0	1	2	0	3	3	89	0	0	92	4	136	1	0	141	239
Total Volume	1	4	5	0	10	4	5	13	1	23	13	339	4	0	356	10	586	4	0	600	989
% App. Total	10	40	50	0		17.4	21.7	56.5	4.3		3.7	95.2	1.1	0		1.7	97.7	0.7	0		
PHF	.250	.500	.625	.000	.833	.333	.625	.813	.250	.575	.650	.952	.333	.000	.947	.625	.805	.500	.000	.802	.883

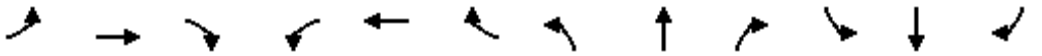
APPENDIX F

2015 EXISTING CAPACITY REPORT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	282	1	642	0	0	0	0	1004	112	99	546	0
Future Volume (vph)	282	1	642	0	0	0	0	1004	112	99	546	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frt	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1457	1504					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.14	1.00	
Satd. Flow (perm)	1681	1457	1504					3539	1583	257	3539	
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	357	1	813	0	0	0	0	1240	138	122	674	0
RTOR Reduction (vph)	0	176	176	0	0	0	0	0	72	0	0	0
Lane Group Flow (vph)	321	252	248	0	0	0	0	1240	66	122	674	0
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	17.6	17.6	17.6					38.3	38.3	50.0	50.0	
Effective Green, g (s)	17.6	17.6	17.6					38.3	38.3	50.0	50.0	
Actuated g/C Ratio	0.22	0.22	0.22					0.48	0.48	0.62	0.62	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	369	320	330					1694	757	260	2211	
v/s Ratio Prot								c0.35		c0.03	0.19	
v/s Ratio Perm	c0.19	0.17	0.16						0.04	0.26		
v/c Ratio	0.87	0.79	0.75					0.73	0.09	0.47	0.30	
Uniform Delay, d1	30.1	29.4	29.1					16.7	11.3	19.7	6.9	
Progression Factor	1.00	1.00	1.00					0.86	0.81	0.34	0.23	
Incremental Delay, d2	18.5	11.1	8.2					2.7	0.2	0.4	0.3	
Delay (s)	48.6	40.5	37.4					17.1	9.4	7.2	1.9	
Level of Service	D	D	D					B	A	A	A	
Approach Delay (s)		41.6			0.0			16.3			2.7	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	256	191	287	210	122	78	213	135	78	245	76
Future Volume (vph)	148	256	191	287	210	122	78	213	135	78	245	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3181		1703	3406	1524
Flt Permitted	0.55	1.00	1.00	0.46	1.00	1.00	0.59	1.00		0.45	1.00	1.00
Satd. Flow (perm)	1003	1827	1553	858	1863	1583	1056	3181		808	3406	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	164	284	212	309	226	131	94	257	163	84	263	82
RTOR Reduction (vph)	0	0	153	0	0	89	0	107	0	0	0	59
Lane Group Flow (vph)	164	284	59	309	226	42	94	313	0	84	263	23
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	31.7	25.0	25.0	39.7	29.0	29.0	29.5	24.8		29.5	24.8	24.8
Effective Green, g (s)	31.7	25.0	25.0	39.7	29.0	29.0	29.5	24.8		29.5	24.8	24.8
Actuated g/C Ratio	0.35	0.28	0.28	0.44	0.32	0.32	0.33	0.28		0.33	0.28	0.28
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	407	507	431	486	600	510	379	876		311	938	419
v/s Ratio Prot	0.03	0.16		c0.08	0.12		0.01	c0.10		c0.01	0.08	
v/s Ratio Perm	0.11		0.04	c0.20		0.03	0.07			0.07		0.01
v/c Ratio	0.40	0.56	0.14	0.64	0.38	0.08	0.25	0.36		0.27	0.28	0.05
Uniform Delay, d1	24.2	27.8	24.4	24.7	23.5	21.2	22.3	26.2		24.5	25.6	24.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	4.4	0.7	2.7	1.8	0.3	0.3	1.1		0.5	0.7	0.2
Delay (s)	24.9	32.2	25.1	27.4	25.3	21.6	22.7	27.3		24.9	26.3	24.2
Level of Service	C	C	C	C	C	C	C	C		C	C	C
Approach Delay (s)		28.1			25.6			26.5			25.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	123	0	52	651	635	0	0	522	325
Future Volume (vph)	0	0	0	123	0	52	651	635	0	0	522	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0		6.0	6.3	6.3			6.3	
Lane Util. Factor				1.00		1.00	1.00	0.95			0.95	
Frt				1.00		0.85	1.00	1.00			0.94	
Flt Protected				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1770		1583	1770	3539			3336	
Flt Permitted				0.95		1.00	0.19	1.00			1.00	
Satd. Flow (perm)				1770		1583	358	3539			3336	
Peak-hour factor, PHF	0.92	0.92	0.92	0.83	0.83	0.83	0.95	0.86	0.86	0.89	0.89	0.89
Adj. Flow (vph)	0	0	0	148	0	63	685	738	0	0	587	365
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	111	0
Lane Group Flow (vph)	0	0	0	148	0	8	685	738	0	0	841	0
Turn Type				Prot		Prot	D.P+P	NA			NA	
Protected Phases				3		3	2	5			1	
Permitted Phases							1					
Actuated Green, G (s)				9.8		9.8	51.6	57.9			32.9	
Effective Green, g (s)				9.8		9.8	51.6	57.9			32.9	
Actuated g/C Ratio				0.12		0.12	0.65	0.72			0.41	
Clearance Time (s)				6.0		6.0	6.3	6.3			6.3	
Vehicle Extension (s)				0.2		0.2	0.2	0.2			0.2	
Lane Grp Cap (vph)				216		193	560	2561			1371	
v/s Ratio Prot				c0.08		0.00	c0.29	0.21			0.25	
v/s Ratio Perm							c0.50					
v/c Ratio				0.69		0.04	1.22	0.29			0.61	
Uniform Delay, d1				33.6		31.0	20.3	3.9			18.5	
Progression Factor				1.00		1.00	0.86	0.66			1.20	
Incremental Delay, d2				7.0		0.0	111.5	0.2			2.0	
Delay (s)				40.6		31.0	129.0	2.8			24.3	
Level of Service				D		C	F	A			C	
Approach Delay (s)		0.0			37.7			63.5			24.3	
Approach LOS		A			D			E			C	

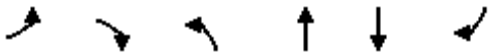
Intersection Summary			
HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	197	53	41	166	277	29	321	28	147	285	75
Future Volume (vph)	231	197	53	41	166	277	29	321	28	147	285	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3497		1770	3429	
Flt Permitted	0.61	1.00	1.00	0.53	1.00	1.00	0.51	1.00		0.48	1.00	
Satd. Flow (perm)	1131	1863	1583	987	1863	1583	941	3497		886	3429	
Peak-hour factor, PHF	0.84	0.84	0.84	0.87	0.87	0.87	0.72	0.72	0.72	0.85	0.85	0.85
Adj. Flow (vph)	275	235	63	47	191	318	40	446	39	173	335	88
RTOR Reduction (vph)	0	0	46	0	0	234	0	8	0	0	29	0
Lane Group Flow (vph)	275	235	17	47	191	84	40	477	0	173	394	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	21.1	21.1	21.1	21.1	21.1	21.1	46.9	46.9		46.9	46.9	
Effective Green, g (s)	21.1	21.1	21.1	21.1	21.1	21.1	46.9	46.9		46.9	46.9	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.59	0.59		0.59	0.59	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	298	491	417	260	491	417	551	2050		519	2010	
v/s Ratio Prot		0.13			0.10			0.14			0.12	
v/s Ratio Perm	c0.24		0.01	0.05		0.05	0.04			c0.20		
v/c Ratio	0.92	0.48	0.04	0.18	0.39	0.20	0.07	0.23		0.33	0.20	
Uniform Delay, d1	28.7	24.8	21.9	22.8	24.2	22.9	7.2	7.9		8.5	7.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.12	1.17	
Incremental Delay, d2	32.5	0.7	0.0	0.3	0.5	0.2	0.3	0.3		1.5	0.2	
Delay (s)	61.2	25.6	22.0	23.1	24.7	23.1	7.4	8.2		11.1	9.3	
Level of Service	E	C	C	C	C	C	A	A		B	A	
Approach Delay (s)		42.3			23.7			8.1			9.8	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	133	122	32	644	663	66
Future Volume (vph)	133	122	32	644	663	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3491	
Flt Permitted	0.95	1.00	0.32	1.00	1.00	
Satd. Flow (perm)	1770	1583	605	3539	3491	
Peak-hour factor, PHF	0.73	0.73	0.82	0.82	0.94	0.94
Adj. Flow (vph)	182	167	39	785	705	70
RTOR Reduction (vph)	0	139	0	0	7	0
Lane Group Flow (vph)	182	28	39	785	768	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	13.4	13.4	54.3	54.3	42.8	
Effective Green, g (s)	13.4	13.4	54.3	54.3	42.8	
Actuated g/C Ratio	0.17	0.17	0.68	0.68	0.53	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	296	265	486	2402	1867	
v/s Ratio Prot	c0.10		0.01	c0.22	c0.22	
v/s Ratio Perm		0.02	0.05			
v/c Ratio	0.61	0.11	0.08	0.33	0.41	
Uniform Delay, d1	30.9	28.2	6.1	5.3	11.1	
Progression Factor	1.00	1.00	0.21	0.30	0.73	
Incremental Delay, d2	3.8	0.2	0.1	0.4	0.7	
Delay (s)	34.7	28.4	1.3	1.9	8.7	
Level of Service	C	C	A	A	A	
Approach Delay (s)	31.7			1.9	8.7	
Approach LOS	C			A	A	

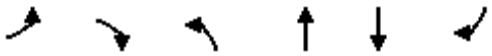
Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	144	40	632	145	20	585
Future Volume (vph)	144	40	632	145	20	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3440		1770	3539
Flt Permitted	0.95	1.00	1.00		0.26	1.00
Satd. Flow (perm)	1770	1583	3440		483	3539
Peak-hour factor, PHF	0.88	0.88	0.78	0.78	0.85	0.85
Adj. Flow (vph)	164	45	810	186	24	688
RTOR Reduction (vph)	0	38	17	0	0	0
Lane Group Flow (vph)	164	7	979	0	24	688
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.7	12.7	40.9		55.4	55.4
Effective Green, g (s)	12.7	12.7	40.9		55.4	55.4
Actuated g/C Ratio	0.16	0.16	0.51		0.69	0.69
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	280	251	1758		392	2450
v/s Ratio Prot	c0.09		c0.28		0.00	c0.19
v/s Ratio Perm		0.00			0.04	
v/c Ratio	0.59	0.03	0.56		0.06	0.28
Uniform Delay, d1	31.2	28.4	13.4		5.8	4.7
Progression Factor	1.00	1.00	0.73		1.00	1.00
Incremental Delay, d2	3.1	0.0	1.2		0.1	0.3
Delay (s)	34.3	28.5	11.0		5.9	5.0
Level of Service	C	C	B		A	A
Approach Delay (s)	33.1		11.0			5.0
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

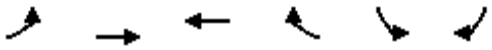
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	231	2	15	796	582	198
Future Volume (vph)	231	2	15	796	582	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3404	
Flt Permitted	0.95	1.00	0.18	1.00	1.00	
Satd. Flow (perm)	3433	1583	331	3539	3404	
Peak-hour factor, PHF	0.60	0.60	0.85	0.85	0.61	0.61
Adj. Flow (vph)	385	3	18	936	954	325
RTOR Reduction (vph)	0	2	0	0	33	0
Lane Group Flow (vph)	385	1	18	936	1246	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	14.4	14.4	53.3	53.3	53.3	
Effective Green, g (s)	14.4	14.4	53.3	53.3	53.3	
Actuated g/C Ratio	0.18	0.18	0.67	0.67	0.67	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	617	284	220	2357	2267	
v/s Ratio Prot	c0.11			0.26	c0.37	
v/s Ratio Perm		0.00	0.05			
v/c Ratio	0.62	0.00	0.08	0.40	0.55	
Uniform Delay, d1	30.3	26.9	4.7	6.1	7.0	
Progression Factor	1.00	1.00	0.68	0.66	0.78	
Incremental Delay, d2	2.0	0.0	0.7	0.5	0.9	
Delay (s)	32.3	26.9	3.9	4.4	6.4	
Level of Service	C	C	A	A	A	
Approach Delay (s)	32.2			4.4	6.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		

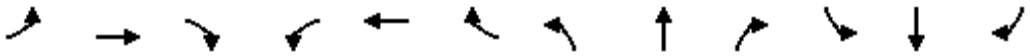
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	144	456	243	25	10	52
Future Volume (Veh/h)	144	456	243	25	10	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.67	0.67	0.60	0.60
Hourly flow rate (vph)	176	556	363	37	17	87
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	400				1272	364
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	400				1272	364
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				89	87
cM capacity (veh/h)	1159				157	680

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	176	556	363	37	17	87
Volume Left	176	0	0	0	17	0
Volume Right	0	0	0	37	0	87
cSH	1159	1700	1700	1700	157	680
Volume to Capacity	0.15	0.33	0.21	0.02	0.11	0.13
Queue Length 95th (ft)	13	0	0	0	9	11
Control Delay (s)	8.7	0.0	0.0	0.0	30.7	11.1
Lane LOS	A				D	B
Approach Delay (s)	2.1		0.0		14.3	
Approach LOS					B	

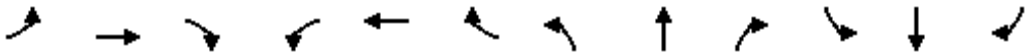
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	0	28	1	1	0	50	770	2	7	513	64
Future Volume (Veh/h)	41	0	28	1	1	0	50	770	2	7	513	64
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.90	0.90	0.90	0.72	0.72	0.72
Hourly flow rate (vph)	68	0	47	2	2	0	56	856	2	10	713	89
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.95	0.95	0.95	0.95	0.95		0.95					
vC, conflicting volume	1318	1748	401	1346	1791	429	802			858		
vC1, stage 1 conf vol	778	778		969	969							
vC2, stage 2 conf vol	541	970		376	822							
vCu, unblocked vol	1232	1683	268	1261	1729	429	689			858		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	78	100	93	99	99	100	93			99		
cM capacity (veh/h)	309	250	695	239	238	574	857			779		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	115	4	56	571	287	10	475	327
Volume Left	68	2	56	0	0	10	0	0
Volume Right	47	0	0	0	2	0	0	89
cSH	523	239	857	1700	1700	779	1700	1700
Volume to Capacity	0.22	0.02	0.07	0.34	0.17	0.01	0.28	0.19
Queue Length 95th (ft)	21	1	5	0	0	1	0	0
Control Delay (s)	16.1	20.4	9.5	0.0	0.0	9.7	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	16.1	20.4	0.6			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	38.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	1	27	2	128	8	981	38	102	752	334
Future Volume (Veh/h)	7	0	1	27	2	128	8	981	38	102	752	334
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.88	0.88	0.95	0.74	0.74	0.74	0.66	0.66	0.66
Hourly flow rate (vph)	12	0	2	31	2	135	11	1326	51	155	1139	506
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92	0.88	0.92			0.88		
vC, conflicting volume	2524	3102	824	2255	3330	688	1646			1377		
vC1, stage 1 conf vol	1703	1703		1374	1374							
vC2, stage 2 conf vol	821	1399		882	1956							
vCu, unblocked vol	2088	2715	632	1795	2962	374	1527			1156		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	100	99	79	97	75	97			71		
cM capacity (veh/h)	66	58	389	145	63	549	397			528		

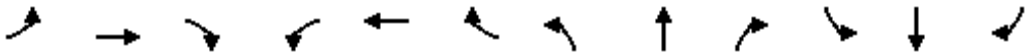
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	12	2	33	135	11	884	493	155	759	886
Volume Left	12	0	31	0	11	0	0	155	0	0
Volume Right	0	2	0	135	0	0	51	0	0	506
cSH	66	389	134	549	397	1700	1700	528	1700	1700
Volume to Capacity	0.18	0.01	0.25	0.25	0.03	0.52	0.29	0.29	0.45	0.52
Queue Length 95th (ft)	15	0	23	24	2	0	0	30	0	0
Control Delay (s)	71.4	14.3	40.3	13.7	14.3	0.0	0.0	14.6	0.0	0.0
Lane LOS	F	B	E	B	B			B		
Approach Delay (s)	63.2		18.9		0.1			1.3		
Approach LOS	F		C							

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	53.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	16	5	8	22	3
Future Volume (Veh/h)	6	16	5	8	22	3
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	9	25	8	12	30	4
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	79	15			21	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	79	15			21	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			98	
cM capacity (veh/h)	905	1064			1593	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	34	20	34
Volume Left	9	0	30
Volume Right	25	12	0
cSH	1017	1700	1593
Volume to Capacity	0.03	0.01	0.02
Queue Length 95th (ft)	3	0	1
Control Delay (s)	8.7	0.0	6.5
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	6.5
Approach LOS	A		

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	592	0	1	293	1	3	8	6	2	1	6
Future Volume (Veh/h)	4	592	0	1	293	1	3	8	6	2	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	5	722	0	1	362	1	4	12	9	2	1	7
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	366			723			1106	1101	723	1114	1100	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			723			1106	1101	723	1114	1100	366
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	94	98	99	100	99
cM capacity (veh/h)	1189			878			184	210	426	172	210	676

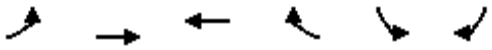
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	727	364	25	10
Volume Left	5	1	4	2
Volume Right	0	1	9	7
cSH	1189	878	250	374
Volume to Capacity	0.00	0.00	0.10	0.03
Queue Length 95th (ft)	0	0	8	2
Control Delay (s)	0.1	0.0	21.0	14.9
Lane LOS	A	A	C	B
Approach Delay (s)	0.1	0.0	21.0	14.9
Approach LOS			C	B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	180	15	10	70	6	15
Future Volume (Veh/h)	180	15	10	70	6	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.83	0.83	0.60	0.60
Hourly flow rate (vph)	209	17	12	84	10	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			226		326	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			226		326	218
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	97
cM capacity (veh/h)			1342		663	822

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	226	96	35
Volume Left	0	12	10
Volume Right	17	0	25
cSH	1700	1342	769
Volume to Capacity	0.13	0.01	0.05
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	1.0	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	1.0	9.9
Approach LOS			A

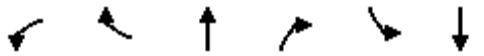
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	116	51	48	56	29
Future Volume (Veh/h)	79	116	51	48	56	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.79	0.79	0.73	0.73	0.69	0.69
Hourly flow rate (vph)	100	147	70	66	81	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	136				450	103
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136				450	103
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				85	96
cM capacity (veh/h)	1448				528	952

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	247	136	123
Volume Left	100	0	81
Volume Right	0	66	42
cSH	1448	1700	622
Volume to Capacity	0.07	0.08	0.20
Queue Length 95th (ft)	6	0	18
Control Delay (s)	3.5	0.0	12.2
Lane LOS	A		B
Approach Delay (s)	3.5	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	180	0	264	459
Future Volume (Veh/h)	0	0	180	0	264	459
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	196	0	287	499
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1269	196			196	
vC1, stage 1 conf vol	196					
vC2, stage 2 conf vol	1073					
vCu, unblocked vol	1269	196			196	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			79	
cM capacity (veh/h)	251	845			1377	

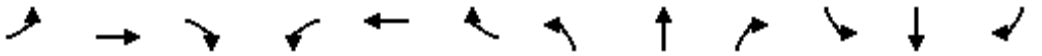
Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	196	287	499
Volume Left	0	287	0
Volume Right	0	0	0
cSH	1700	1377	1700
Volume to Capacity	0.12	0.21	0.29
Queue Length 95th (ft)	0	20	0
Control Delay (s)	0.0	8.3	0.0
Lane LOS		A	
Approach Delay (s)	0.0	3.0	
Approach LOS			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	351	0	552	0	0	0	0	1197	94	51	467	0
Future Volume (vph)	351	0	552	0	0	0	0	1197	94	51	467	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	0.99					1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1445	1484					3539	1583	1770	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.10	1.00	
Satd. Flow (perm)	1681	1445	1484					3539	1583	180	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	373	0	587	0	0	0	0	1408	111	57	525	0
RTOR Reduction (vph)	0	213	240	0	0	0	0	0	57	0	0	0
Lane Group Flow (vph)	336	100	71	0	0	0	0	1408	54	57	525	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	18.2	18.2	18.2					39.0	39.0	49.4	49.4	
Effective Green, g (s)	18.2	18.2	18.2					39.0	39.0	49.4	49.4	
Actuated g/C Ratio	0.23	0.23	0.23					0.49	0.49	0.62	0.62	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	382	328	337					1725	771	190	2185	
v/s Ratio Prot								c0.40		0.01	c0.15	
v/s Ratio Perm	c0.20	0.07	0.05						0.03	0.17		
v/c Ratio	0.88	0.30	0.21					0.82	0.07	0.30	0.24	
Uniform Delay, d1	29.8	25.6	25.1					17.4	10.9	20.8	6.9	
Progression Factor	1.00	1.00	1.00					0.83	0.67	0.55	0.39	
Incremental Delay, d2	19.4	0.2	0.1					4.0	0.2	0.2	0.2	
Delay (s)	49.3	25.8	25.2					18.5	7.4	11.7	2.8	
Level of Service	D	C	C					B	A	B	A	
Approach Delay (s)		33.8			0.0			17.7			3.7	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

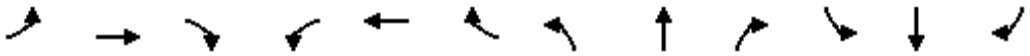
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	318	159	165	298	153	297	411	246	204	165	202
Future Volume (vph)	78	318	159	165	298	153	297	411	246	204	165	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3214		1703	3406	1524
Flt Permitted	0.40	1.00	1.00	0.36	1.00	1.00	0.64	1.00		0.22	1.00	1.00
Satd. Flow (perm)	731	1827	1553	673	1863	1583	1151	3214		394	3406	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	346	173	176	317	163	313	433	259	215	174	213
RTOR Reduction (vph)	0	0	125	0	0	114	0	98	0	0	0	156
Lane Group Flow (vph)	85	346	48	176	317	49	313	594	0	215	174	57
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	30.2	25.0	25.0	34.8	27.3	27.3	32.7	23.9		32.7	23.9	23.9
Effective Green, g (s)	30.2	25.0	25.0	34.8	27.3	27.3	32.7	23.9		32.7	23.9	23.9
Actuated g/C Ratio	0.34	0.28	0.28	0.39	0.30	0.30	0.36	0.27		0.36	0.27	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	303	507	431	351	565	480	472	853		271	904	404
v/s Ratio Prot	0.02	c0.19		c0.04	0.17		0.06	0.18		c0.08	0.05	
v/s Ratio Perm	0.08		0.03	0.15		0.03	0.18			c0.21		0.04
v/c Ratio	0.28	0.68	0.11	0.50	0.56	0.10	0.66	0.70		0.79	0.19	0.14
Uniform Delay, d1	27.3	29.0	24.2	28.0	26.3	22.5	25.1	29.8		31.7	25.6	25.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	7.3	0.5	1.1	4.0	0.4	3.5	4.7		14.7	0.5	0.7
Delay (s)	27.8	36.2	24.7	29.1	30.3	23.0	28.5	34.4		46.4	26.1	25.9
Level of Service	C	D	C	C	C	C	C	C		D	C	C
Approach Delay (s)		31.8			28.2			32.6			33.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

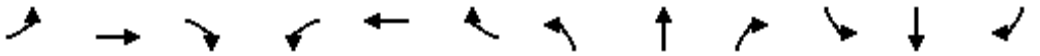
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	76	0	143	782	766	0	0	442	395
Future Volume (vph)	0	0	0	76	0	143	782	766	0	0	442	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0		6.0	6.3	6.3			6.3	
Lane Util. Factor				1.00		1.00	1.00	0.95			0.95	
Frt				1.00		0.85	1.00	1.00			0.93	
Flt Protected				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1770		1583	1770	3539			3289	
Flt Permitted				0.95		1.00	0.16	1.00			1.00	
Satd. Flow (perm)				1770		1583	298	3539			3289	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.95	0.89	0.89	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	97	0	183	823	861	0	0	491	439
RTOR Reduction (vph)	0	0	0	0	0	165	0	0	0	0	197	0
Lane Group Flow (vph)	0	0	0	97	0	18	823	861	0	0	733	0
Turn Type				Prot		Prot	D.P+P	NA			NA	
Protected Phases				3		3	2	5			1	
Permitted Phases							1					
Actuated Green, G (s)				7.7		7.7	53.7	60.0			25.0	
Effective Green, g (s)				7.7		7.7	53.7	60.0			25.0	
Actuated g/C Ratio				0.10		0.10	0.67	0.75			0.31	
Clearance Time (s)				6.0		6.0	6.3	6.3			6.3	
Vehicle Extension (s)				0.2		0.2	0.2	0.2			0.2	
Lane Grp Cap (vph)				170		152	728	2654			1027	
v/s Ratio Prot				c0.05		0.01	c0.41	0.24			0.22	
v/s Ratio Perm							c0.35					
v/c Ratio				0.57		0.12	1.13	0.32			0.71	
Uniform Delay, d1				34.6		33.0	20.4	3.3			24.3	
Progression Factor				1.00		1.00	0.52	0.15			0.65	
Incremental Delay, d2				2.9		0.1	69.9	0.2			3.6	
Delay (s)				37.4		33.2	80.5	0.7			19.4	
Level of Service				D		C	F	A			B	
Approach Delay (s)		0.0			34.6			39.7			19.4	
Approach LOS		A			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

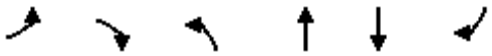
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	217	46	61	281	217	66	317	64	281	343	157
Future Volume (vph)	148	217	46	61	281	217	66	317	64	281	343	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3450		1770	3372	
Flt Permitted	0.32	1.00	1.00	0.55	1.00	1.00	0.45	1.00		0.47	1.00	
Satd. Flow (perm)	595	1863	1583	1022	1863	1583	835	3450		866	3372	
Peak-hour factor, PHF	0.95	0.95	0.95	0.76	0.76	0.76	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	156	228	48	80	370	286	88	423	85	302	369	169
RTOR Reduction (vph)	0	0	35	0	0	207	0	21	0	0	67	0
Lane Group Flow (vph)	156	228	13	80	370	79	88	487	0	302	471	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	163	512	435	281	512	435	480	1983		497	1938	
v/s Ratio Prot		0.12			0.20			0.14			0.14	
v/s Ratio Perm	c0.26		0.01	0.08		0.05	0.11			c0.35		
v/c Ratio	0.96	0.45	0.03	0.28	0.72	0.18	0.18	0.25		0.61	0.24	
Uniform Delay, d1	28.5	24.0	21.2	22.8	26.2	22.1	8.1	8.4		11.1	8.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.40	1.70	
Incremental Delay, d2	57.2	0.6	0.0	0.6	5.0	0.2	0.8	0.3		5.1	0.3	
Delay (s)	85.7	24.6	21.2	23.4	31.2	22.3	8.9	8.7		20.6	14.5	
Level of Service	F	C	C	C	C	C	A	A		C	B	
Approach Delay (s)		46.3			26.9			8.7			16.7	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	136	73	138	887	798	185
Future Volume (vph)	136	73	138	887	798	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1561	1770	3539	3439	
Flt Permitted	0.95	1.00	0.21	1.00	1.00	
Satd. Flow (perm)	1770	1561	391	3539	3439	
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.94	0.94
Adj. Flow (vph)	148	79	152	975	849	197
RTOR Reduction (vph)	0	67	0	0	21	0
Lane Group Flow (vph)	148	12	152	975	1025	0
Confl. Peds. (#/hr)		1				
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	11.9	11.9	55.8	55.8	40.8	
Effective Green, g (s)	11.9	11.9	55.8	55.8	40.8	
Actuated g/C Ratio	0.15	0.15	0.70	0.70	0.51	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	263	232	422	2468	1753	
v/s Ratio Prot	c0.08		0.04	c0.28	c0.30	
v/s Ratio Perm		0.01	0.21			
v/c Ratio	0.56	0.05	0.36	0.40	0.58	
Uniform Delay, d1	31.6	29.2	11.0	5.1	13.7	
Progression Factor	1.00	1.00	0.78	0.75	0.73	
Incremental Delay, d2	2.7	0.1	0.5	0.5	1.4	
Delay (s)	34.4	29.3	9.1	4.2	11.3	
Level of Service	C	C	A	A	B	
Approach Delay (s)	32.6			4.9	11.3	
Approach LOS	C			A	B	

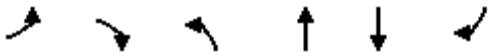
Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	121	46	912	111	40	862
Future Volume (vph)	121	46	912	111	40	862
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3482		1770	3539
Flt Permitted	0.95	1.00	1.00		0.22	1.00
Satd. Flow (perm)	1770	1583	3482		404	3539
Peak-hour factor, PHF	0.80	0.80	0.93	0.93	0.89	0.89
Adj. Flow (vph)	151	58	981	119	45	969
RTOR Reduction (vph)	0	49	9	0	0	0
Lane Group Flow (vph)	151	9	1091	0	45	969
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.1	12.1	39.6		56.0	56.0
Effective Green, g (s)	12.1	12.1	39.6		56.0	56.0
Actuated g/C Ratio	0.15	0.15	0.50		0.70	0.70
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	267	239	1723		376	2477
v/s Ratio Prot	c0.09		c0.31		0.01	c0.27
v/s Ratio Perm		0.01			0.08	
v/c Ratio	0.57	0.04	0.63		0.12	0.39
Uniform Delay, d1	31.5	29.0	14.9		7.2	5.0
Progression Factor	1.00	1.00	0.77		1.00	1.00
Incremental Delay, d2	2.7	0.1	1.7		0.1	0.5
Delay (s)	34.2	29.0	13.1		7.3	5.4
Level of Service	C	C	B		A	A
Approach Delay (s)	32.8		13.1			5.5
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

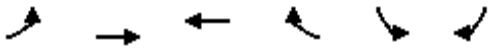
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	476	24	7	739	740	155
Future Volume (vph)	476	24	7	739	740	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3447	
Flt Permitted	0.95	1.00	0.27	1.00	1.00	
Satd. Flow (perm)	3433	1583	496	3539	3447	
Peak-hour factor, PHF	0.83	0.83	0.77	0.77	0.94	0.94
Adj. Flow (vph)	573	29	9	960	787	165
RTOR Reduction (vph)	0	22	0	0	20	0
Lane Group Flow (vph)	573	7	9	960	932	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	18.6	18.6	49.1	49.1	49.1	
Effective Green, g (s)	18.6	18.6	49.1	49.1	49.1	
Actuated g/C Ratio	0.23	0.23	0.61	0.61	0.61	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	798	368	304	2172	2115	
v/s Ratio Prot	c0.17			c0.27	0.27	
v/s Ratio Perm		0.00	0.02			
v/c Ratio	0.72	0.02	0.03	0.44	0.44	
Uniform Delay, d1	28.3	23.7	6.1	8.2	8.2	
Progression Factor	1.00	1.00	0.81	0.79	0.58	
Incremental Delay, d2	3.1	0.0	0.2	0.6	0.6	
Delay (s)	31.4	23.7	5.1	7.1	5.4	
Level of Service	C	C	A	A	A	
Approach Delay (s)	31.0			7.1	5.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

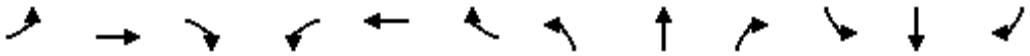
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	64	378	478	12	23	127
Future Volume (Veh/h)	64	378	478	12	23	127
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	68	402	503	13	26	143
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	516				1042	504
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	516				1042	504
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				89	75
cM capacity (veh/h)	1050				238	567

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	68	402	503	13	26	143
Volume Left	68	0	0	0	26	0
Volume Right	0	0	0	13	0	143
cSH	1050	1700	1700	1700	238	567
Volume to Capacity	0.06	0.24	0.30	0.01	0.11	0.25
Queue Length 95th (ft)	5	0	0	0	9	25
Control Delay (s)	8.7	0.0	0.0	0.0	22.0	13.5
Lane LOS	A				C	B
Approach Delay (s)	1.3		0.0		14.8	
Approach LOS					B	

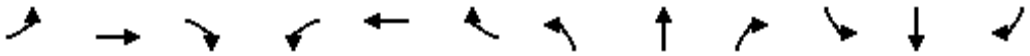
Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	0	34	5	0	8	55	679	4	3	711	50
Future Volume (Veh/h)	59	0	34	5	0	8	55	679	4	3	711	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.65	0.65	0.60	0.60	0.60	0.87	0.87	0.87	0.95	0.95	0.95
Hourly flow rate (vph)	91	0	52	8	0	13	63	780	5	3	748	53
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1310	1692	400	1288	1716	394	801			785		
vC1, stage 1 conf vol	780	780		908	908							
vC2, stage 2 conf vol	530	911		380	807							
vCu, unblocked vol	1123	1546	111	1098	1573	394	556			785		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	73	100	94	97	100	98	93			100		
cM capacity (veh/h)	336	274	828	263	260	605	909			829		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	143	21	63	520	265	3	499	302
Volume Left	91	8	63	0	0	3	0	0
Volume Right	52	13	0	0	5	0	0	53
cSH	528	404	909	1700	1700	829	1700	1700
Volume to Capacity	0.27	0.05	0.07	0.31	0.16	0.00	0.29	0.18
Queue Length 95th (ft)	27	4	6	0	0	0	0	0
Control Delay (s)	16.0	14.4	9.3	0.0	0.0	9.4	0.0	0.0
Lane LOS	C	B	A			A		
Approach Delay (s)	16.0	14.4	0.7			0.0		
Approach LOS	C	B						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	41.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	5	25	40	1	80	9	1162	44	61	830	128
Future Volume (Veh/h)	49	5	25	40	1	80	9	1162	44	61	830	128
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.69	0.69	0.69	0.85	0.85	0.85	0.86	0.86	0.86
Hourly flow rate (vph)	67	7	34	58	1	116	11	1367	52	71	965	149
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.89	0.89	0.94	0.89	0.89	0.86	0.94			0.86		
vC, conflicting volume	2004	2624	558	2077	2672	710	1115			1419		
vC1, stage 1 conf vol	1182	1182		1415	1415							
vC2, stage 2 conf vol	822	1441		662	1257							
vCu, unblocked vol	1585	2279	404	1667	2333	346	996			1168		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	58	94	94	63	99	79	98			86		
cM capacity (veh/h)	161	125	560	158	150	561	649			512		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	67	41	59	116	11	911	508	71	643	471
Volume Left	67	0	58	0	11	0	0	71	0	0
Volume Right	0	34	0	116	0	0	52	0	0	149
cSH	161	352	158	561	649	1700	1700	512	1700	1700
Volume to Capacity	0.42	0.12	0.37	0.21	0.02	0.54	0.30	0.14	0.38	0.28
Queue Length 95th (ft)	46	10	40	19	1	0	0	12	0	0
Control Delay (s)	42.4	16.6	40.8	13.1	10.6	0.0	0.0	13.2	0.0	0.0
Lane LOS	E	C	E	B	B			B		
Approach Delay (s)	32.6		22.4		0.1			0.8		
Approach LOS	D		C							

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	33	18	3	18	18
Future Volume (Veh/h)	9	33	18	3	18	18
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	15	55	23	4	25	25
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	101	25			27	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101	25			27	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	95			98	
cM capacity (veh/h)	883	1051			1587	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	70	27	50
Volume Left	15	0	25
Volume Right	55	4	0
cSH	1010	1700	1587
Volume to Capacity	0.07	0.02	0.02
Queue Length 95th (ft)	6	0	1
Control Delay (s)	8.8	0.0	3.7
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	3.7
Approach LOS	A		

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	433	4	10	591	4	1	4	5	4	10	13
Future Volume (Veh/h)	13	433	4	10	591	4	1	4	5	4	10	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	14	456	4	13	739	5	1	5	6	7	17	22
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	745			460			1284	1257	458	1263	1256	742
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	745			460			1284	1257	458	1263	1256	742
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			99	97	99	95	90	95
cM capacity (veh/h)	862			1101			121	166	603	139	166	415

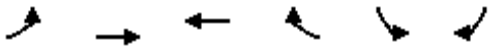
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	474	757	12	46
Volume Left	14	13	1	7
Volume Right	4	5	6	22
cSH	862	1101	248	224
Volume to Capacity	0.02	0.01	0.05	0.21
Queue Length 95th (ft)	1	1	4	19
Control Delay (s)	0.5	0.3	20.2	25.2
Lane LOS	A	A	C	D
Approach Delay (s)	0.5	0.3	20.2	25.2
Approach LOS			C	D

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	187	12	24	290	20	31
Future Volume (Veh/h)	187	12	24	290	20	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	225	14	27	330	23	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			239		616	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			239		616	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	96
cM capacity (veh/h)			1328		445	807

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	239	357	59
Volume Left	0	27	23
Volume Right	14	0	36
cSH	1700	1328	613
Volume to Capacity	0.14	0.02	0.10
Queue Length 95th (ft)	0	2	8
Control Delay (s)	0.0	0.8	11.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	11.5
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	99	119	193	93	91	121
Future Volume (Veh/h)	99	119	193	93	91	121
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.82	0.82	0.88	0.88
Hourly flow rate (vph)	111	134	235	113	103	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	348				648	292
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	348				648	292
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				74	82
cM capacity (veh/h)	1211				395	748

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	245	348	241
Volume Left	111	0	103
Volume Right	0	113	138
cSH	1211	1700	541
Volume to Capacity	0.09	0.20	0.45
Queue Length 95th (ft)	8	0	57
Control Delay (s)	4.2	0.0	16.9
Lane LOS	A		C
Approach Delay (s)	4.2	0.0	16.9
Approach LOS			C

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	366	0	200	289
Future Volume (Veh/h)	0	0	366	0	200	289
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	398	0	217	314
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1146	398			398	
vC1, stage 1 conf vol	398					
vC2, stage 2 conf vol	748					
vCu, unblocked vol	1146	398			398	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			81	
cM capacity (veh/h)	351	652			1161	

Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	398	217	314
Volume Left	0	217	0
Volume Right	0	0	0
cSH	1700	1161	1700
Volume to Capacity	0.23	0.19	0.18
Queue Length 95th (ft)	0	17	0
Control Delay (s)	0.0	8.8	0.0
Lane LOS		A	
Approach Delay (s)	0.0	3.6	
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX G

2020 BUILD CAPACITY REPORTS

Appendix G contains the Synchro capacity analyses worksheets for the alternatives for the year 2020 build conditions. The Dort Highway Corridor Extension includes an intersection each at the North and South I-75 ramps, and intersections at Cook Road, Pollock Road, and Baldwin Road. To cover the alternative conditions, the appendix is divided into the following five sections.

G-1 All Project Area intersections except the Dort Highway Extension intersections

G-2 Dort Highway Extension Alternative A and B intersections with Roundabouts at I-75 Ramps

G-3 Dort Highway Extension Alternative A and B intersections with Stop Signs

G-4 Dort Highway Extension Alternative C intersections on McWain Road with Roundabouts at I-75 Ramps

G-5 Dort Highway Extension Alternative C intersections on McWain Road with Stop Signs

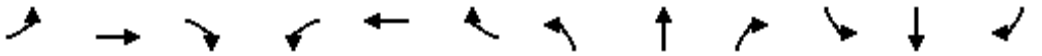
APPENDIX G-1

ALL PROJECT AREA INTERSECTIONS
EXCEPT THE DORT HIGHWAY EXTENSION INTERSECTIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1	405	0	0	0	0	865	77	103	538	0
Future Volume (vph)	290	1	405	0	0	0	0	865	77	103	538	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1478	1504					3539	1583	1770	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.19	1.00	
Satd. Flow (perm)	1681	1478	1504					3539	1583	362	3539	
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	367	1	513	0	0	0	0	1068	95	127	664	0
RTOR Reduction (vph)	0	181	181	0	0	0	0	0	49	0	0	0
Lane Group Flow (vph)	308	110	101	0	0	0	0	1068	46	127	664	0
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	17.2	17.2	17.2					38.7	38.7	50.4	50.4	
Effective Green, g (s)	17.2	17.2	17.2					38.7	38.7	50.4	50.4	
Actuated g/C Ratio	0.21	0.21	0.21					0.48	0.48	0.63	0.63	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	361	317	323					1711	765	321	2229	
v/s Ratio Prot								c0.30		0.03	c0.19	
v/s Ratio Perm	c0.18	0.07	0.07						0.03	0.22		
v/c Ratio	0.85	0.35	0.31					0.62	0.06	0.40	0.30	
Uniform Delay, d1	30.2	26.6	26.4					15.3	11.0	14.8	6.7	
Progression Factor	1.00	1.00	1.00					0.96	1.32	0.95	0.89	
Incremental Delay, d2	16.9	0.2	0.2					1.7	0.1	0.3	0.3	
Delay (s)	47.0	26.9	26.6					16.4	14.7	14.3	6.3	
Level of Service	D	C	C					B	B	B	A	
Approach Delay (s)		33.9			0.0			16.2			7.6	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	256	191	387	210	122	81	223	252	81	278	79
Future Volume (vph)	148	256	191	387	210	122	81	223	252	81	278	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3099		1703	3406	1524
Flt Permitted	0.55	1.00	1.00	0.46	1.00	1.00	0.57	1.00		0.31	1.00	1.00
Satd. Flow (perm)	1003	1827	1553	858	1863	1583	1020	3099		561	3406	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	164	284	212	416	226	131	98	269	304	87	299	85
RTOR Reduction (vph)	0	0	153	0	0	89	0	221	0	0	0	62
Lane Group Flow (vph)	164	284	59	416	226	42	98	352	0	87	299	23
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	32.2	25.0	25.0	40.2	29.0	29.0	29.0	24.2		29.0	24.2	24.2
Effective Green, g (s)	32.2	25.0	25.0	40.2	29.0	29.0	29.0	24.2		29.0	24.2	24.2
Actuated g/C Ratio	0.36	0.28	0.28	0.45	0.32	0.32	0.32	0.27		0.32	0.27	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	417	507	431	496	600	510	365	833		241	915	409
v/s Ratio Prot	0.03	0.16		c0.10	0.12		0.01	c0.11		c0.02	0.09	
v/s Ratio Perm	0.11		0.04	c0.27		0.03	0.07			0.10		0.02
v/c Ratio	0.39	0.56	0.14	0.84	0.38	0.08	0.27	0.42		0.36	0.33	0.06
Uniform Delay, d1	23.8	27.8	24.4	25.2	23.5	21.2	22.9	27.1		28.8	26.4	24.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	4.4	0.7	11.8	1.8	0.3	0.4	1.6		0.9	1.0	0.3
Delay (s)	24.5	32.2	25.1	37.1	25.3	21.6	23.3	28.7		29.7	27.3	24.7
Level of Service	C	C	C	D	C	C	C	C		C	C	C
Approach Delay (s)		28.0			31.0			27.9			27.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	93	54	677	478	548	331
Future Volume (vph)	93	54	677	478	548	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.94	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3339	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3339	
Peak-hour factor, PHF	0.83	0.83	0.86	0.92	0.89	0.89
Adj. Flow (vph)	112	65	787	520	616	372
RTOR Reduction (vph)	0	59	0	127	84	0
Lane Group Flow (vph)	112	6	787	393	904	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	7.2	7.2	60.5	60.5	60.5	
Effective Green, g (s)	7.2	7.2	60.5	60.5	60.5	
Actuated g/C Ratio	0.09	0.09	0.76	0.76	0.76	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	159	142	2676	1197	2525	
v/s Ratio Prot	c0.06	0.00	0.22		c0.27	
v/s Ratio Perm				0.25		
v/c Ratio	0.70	0.04	0.29	0.33	0.36	
Uniform Delay, d1	35.4	33.2	3.1	3.2	3.3	
Progression Factor	1.00	1.00	0.39	0.00	1.54	
Incremental Delay, d2	11.0	0.0	0.2	0.6	0.4	
Delay (s)	46.3	33.3	1.4	0.6	5.4	
Level of Service	D	C	A	A	A	
Approach Delay (s)			1.1		5.4	
Approach LOS			A		A	

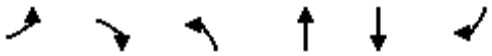
Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	260	118	43	209	326	48	379	29	131	251	64
Future Volume (vph)	129	260	118	43	209	326	48	379	29	131	251	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3502		1770	3432	
Flt Permitted	0.49	1.00	1.00	0.35	1.00	1.00	0.53	1.00		0.44	1.00	
Satd. Flow (perm)	912	1863	1583	657	1863	1583	990	3502		819	3432	
Peak-hour factor, PHF	0.84	0.84	0.84	0.87	0.87	0.87	0.72	0.72	0.72	0.85	0.85	0.85
Adj. Flow (vph)	154	310	140	49	240	375	67	526	40	154	295	75
RTOR Reduction (vph)	0	0	109	0	0	258	0	6	0	0	25	0
Lane Group Flow (vph)	154	310	32	49	240	117	67	560	0	154	345	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	18.0	18.0	18.0	18.0	18.0	18.0	50.0	50.0		50.0	50.0	
Effective Green, g (s)	18.0	18.0	18.0	18.0	18.0	18.0	50.0	50.0		50.0	50.0	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.62	0.62		0.62	0.62	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	205	419	356	147	419	356	618	2188		511	2145	
v/s Ratio Prot		0.17			0.13			0.16			0.10	
v/s Ratio Perm	c0.17		0.02	0.07		0.07	0.07			c0.19		
v/c Ratio	0.75	0.74	0.09	0.33	0.57	0.33	0.11	0.26		0.30	0.16	
Uniform Delay, d1	28.9	28.8	24.5	26.0	27.6	25.9	6.0	6.7		6.9	6.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.33	1.42	
Incremental Delay, d2	14.3	6.7	0.1	1.3	1.9	0.5	0.4	0.3		1.5	0.2	
Delay (s)	43.2	35.5	24.6	27.3	29.5	26.5	6.4	7.0		10.7	9.0	
Level of Service	D	D	C	C	C	C	A	A		B	A	
Approach Delay (s)		35.0			27.6			6.9			9.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	52	138	33	687	679	78
Future Volume (vph)	52	138	33	687	679	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3484	
Flt Permitted	0.95	1.00	0.32	1.00	1.00	
Satd. Flow (perm)	1770	1583	602	3539	3484	
Peak-hour factor, PHF	0.73	0.73	0.82	0.82	0.94	0.94
Adj. Flow (vph)	71	189	40	838	722	83
RTOR Reduction (vph)	0	168	0	0	8	0
Lane Group Flow (vph)	71	21	40	838	797	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	8.9	8.9	58.8	58.8	47.3	
Effective Green, g (s)	8.9	8.9	58.8	58.8	47.3	
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.59	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	196	176	518	2601	2059	
v/s Ratio Prot	c0.04		0.01	c0.24	c0.23	
v/s Ratio Perm		0.01	0.05			
v/c Ratio	0.36	0.12	0.08	0.32	0.39	
Uniform Delay, d1	32.9	32.0	4.2	3.7	8.7	
Progression Factor	1.00	1.00	0.22	0.24	0.70	
Incremental Delay, d2	1.1	0.3	0.1	0.3	0.5	
Delay (s)	34.1	32.3	1.0	1.2	6.6	
Level of Service	C	C	A	A	A	
Approach Delay (s)	32.8			1.2	6.6	
Approach LOS	C			A	A	

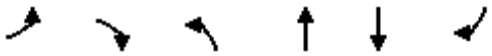
Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	163	40	584	155	21	594
Future Volume (vph)	163	40	584	155	21	594
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3428		1770	3539
Flt Permitted	0.95	1.00	1.00		0.28	1.00
Satd. Flow (perm)	1770	1583	3428		513	3539
Peak-hour factor, PHF	0.88	0.88	0.78	0.78	0.85	0.85
Adj. Flow (vph)	185	45	749	199	25	699
RTOR Reduction (vph)	0	37	22	0	0	0
Lane Group Flow (vph)	185	8	927	0	25	699
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	13.6	13.6	40.0		54.5	54.5
Effective Green, g (s)	13.6	13.6	40.0		54.5	54.5
Actuated g/C Ratio	0.17	0.17	0.50		0.68	0.68
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	300	269	1714		406	2410
v/s Ratio Prot	c0.10		c0.27		0.00	c0.20
v/s Ratio Perm		0.00			0.04	
v/c Ratio	0.62	0.03	0.54		0.06	0.29
Uniform Delay, d1	30.8	27.7	13.7		5.9	5.1
Progression Factor	1.00	1.00	0.78		1.00	1.00
Incremental Delay, d2	3.7	0.0	1.2		0.1	0.3
Delay (s)	34.5	27.7	11.8		5.9	5.4
Level of Service	C	C	B		A	A
Approach Delay (s)	33.2		11.8			5.4
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

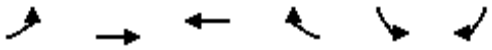
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	101	10	28	739	548	75
Future Volume (vph)	101	10	28	739	548	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3475	
Flt Permitted	0.95	1.00	0.27	1.00	1.00	
Satd. Flow (perm)	3433	1583	497	3539	3475	
Peak-hour factor, PHF	0.60	0.60	0.85	0.85	0.61	0.61
Adj. Flow (vph)	168	17	33	869	898	123
RTOR Reduction (vph)	0	15	0	0	8	0
Lane Group Flow (vph)	168	2	33	869	1013	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	9.3	9.3	58.4	58.4	58.4	
Effective Green, g (s)	9.3	9.3	58.4	58.4	58.4	
Actuated g/C Ratio	0.12	0.12	0.73	0.73	0.73	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	399	184	362	2583	2536	
v/s Ratio Prot	c0.05			0.25	c0.29	
v/s Ratio Perm		0.00	0.07			
v/c Ratio	0.42	0.01	0.09	0.34	0.40	
Uniform Delay, d1	32.8	31.3	3.1	3.9	4.1	
Progression Factor	1.00	1.00	0.77	0.76	0.62	
Incremental Delay, d2	0.7	0.0	0.5	0.3	0.5	
Delay (s)	33.6	31.3	2.9	3.3	3.0	
Level of Service	C	C	A	A	A	
Approach Delay (s)	33.4			3.3	3.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

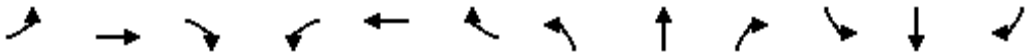
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	306	475	274	50	16	82
Future Volume (Veh/h)	306	475	274	50	16	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.67	0.67	0.60	0.60
Hourly flow rate (vph)	373	579	409	75	27	137
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						8
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	484				1735	410
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	484				1735	410
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	65				57	79
cM capacity (veh/h)	1079				63	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	373	579	409	75	164
Volume Left	373	0	0	0	27
Volume Right	0	0	0	75	137
cSH	1079	1700	1700	1700	382
Volume to Capacity	0.35	0.34	0.24	0.04	0.43
Queue Length 95th (ft)	39	0	0	0	52
Control Delay (s)	10.1	0.0	0.0	0.0	26.6
Lane LOS	B				D
Approach Delay (s)	4.0		0.0		26.6
Approach LOS					D

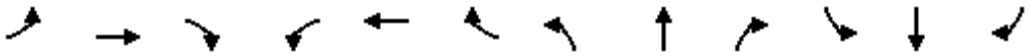
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	0	36	1	1	0	102	715	2	7	448	103
Future Volume (Veh/h)	52	0	36	1	1	0	102	715	2	7	448	103
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.90	0.90	0.90	0.72	0.72	0.72
Hourly flow rate (vph)	87	0	60	2	2	0	113	794	2	10	622	143
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1338	1736	382	1352	1806	398	765			796		
vC1, stage 1 conf vol	714	714		1021	1021							
vC2, stage 2 conf vol	624	1022		331	785							
vCu, unblocked vol	1274	1687	282	1289	1760	398	679			796		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	70	100	91	99	99	100	87			99		
cM capacity (veh/h)	289	230	689	208	209	601	875			822		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	147	4	113	529	267	10	415	350
Volume Left	87	2	113	0	0	10	0	0
Volume Right	60	0	0	0	2	0	0	143
cSH	488	209	875	1700	1700	822	1700	1700
Volume to Capacity	0.30	0.02	0.13	0.31	0.16	0.01	0.24	0.21
Queue Length 95th (ft)	31	1	11	0	0	1	0	0
Control Delay (s)	17.8	22.6	9.7	0.0	0.0	9.4	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	17.8	22.6	1.2			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	38.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	2	27	2	128	13	787	40	106	594	243
Future Volume (Veh/h)	27	0	2	27	2	128	13	787	40	106	594	243
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.88	0.88	0.95	0.74	0.74	0.74	0.66	0.66	0.66
Hourly flow rate (vph)	45	0	3	31	2	135	18	1064	54	161	900	368
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.95	0.95	0.92	0.95	0.95	0.92	0.92			0.92		
vC, conflicting volume	2111	2561	635	1902	2718	559	1269			1118		
vC1, stage 1 conf vol	1407	1407		1127	1127							
vC2, stage 2 conf vol	704	1154		775	1591							
vCu, unblocked vol	1710	2181	440	1491	2346	337	1126			947		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	58	100	99	84	98	78	97			76		
cM capacity (veh/h)	106	102	521	196	105	604	568			661		

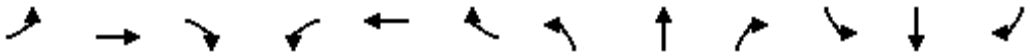
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	45	3	33	135	18	709	409	161	600	668
Volume Left	45	0	31	0	18	0	0	161	0	0
Volume Right	0	3	0	135	0	0	54	0	0	368
cSH	106	521	186	604	568	1700	1700	661	1700	1700
Volume to Capacity	0.42	0.01	0.18	0.22	0.03	0.42	0.24	0.24	0.35	0.39
Queue Length 95th (ft)	45	0	16	21	2	0	0	24	0	0
Control Delay (s)	61.8	11.9	28.5	12.7	11.5	0.0	0.0	12.2	0.0	0.0
Lane LOS	F	B	D	B	B			B		
Approach Delay (s)	58.7		15.8		0.2			1.4		
Approach LOS	F		C							

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	47.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	18	13	27	22	14
Future Volume (Veh/h)	16	18	13	27	22	14
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	25	28	20	42	30	19
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	121	42			63	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	121	42			63	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	97			98	
cM capacity (veh/h)	857	1028			1538	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	53	62	49
Volume Left	25	0	30
Volume Right	28	42	0
cSH	939	1700	1538
Volume to Capacity	0.06	0.04	0.02
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.1	0.0	4.6
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	4.6
Approach LOS	A		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	788	0	1	369	3	3	11	8	6	1	14
Future Volume (Veh/h)	17	788	0	1	369	3	3	11	8	6	1	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	21	961	0	1	456	4	4	16	12	7	1	15
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	463			962			1480	1469	962	1486	1467	462
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	463			962			1480	1469	962	1486	1467	462
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	93	97	97	100	98
cM capacity (veh/h)	1095			715			237	231	430	222	232	699

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	982	461	32	23
Volume Left	21	1	4	7
Volume Right	0	4	12	15
cSH	1095	715	281	401
Volume to Capacity	0.02	0.00	0.11	0.06
Queue Length 95th (ft)	1	0	10	5
Control Delay (s)	0.5	0.0	19.5	14.5
Lane LOS	A	A	C	B
Approach Delay (s)	0.5	0.0	19.5	14.5
Approach LOS			C	B

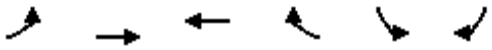
Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	64.5%	ICU Level of Service	C	
Analysis Period (min)	15			

* User Entered Value

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	193	26	10	90	16	15
Future Volume (Veh/h)	193	26	10	90	16	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.83	0.83	0.60	0.60
Hourly flow rate (vph)	224	30	12	108	27	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			254		371	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		371	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		96	97
cM capacity (veh/h)			1311		624	800

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	254	120	52
Volume Left	0	12	27
Volume Right	30	0	25
cSH	1700	1311	698
Volume to Capacity	0.15	0.01	0.07
Queue Length 95th (ft)	0	1	6
Control Delay (s)	0.0	0.8	10.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	10.6
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	37	60	52	70	39
Future Volume (Veh/h)	100	37	60	52	70	39
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.79	0.79	0.73	0.73	0.69	0.69
Hourly flow rate (vph)	127	47	82	71	101	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	153				418	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	153				418	118
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				81	94
cM capacity (veh/h)	1428				539	934

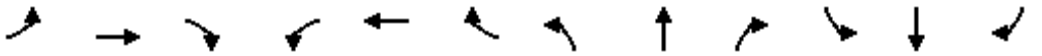
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	174	153	158
Volume Left	127	0	101
Volume Right	0	71	57
cSH	1428	1700	636
Volume to Capacity	0.09	0.09	0.25
Queue Length 95th (ft)	7	0	24
Control Delay (s)	5.9	0.0	12.5
Lane LOS	A		B
Approach Delay (s)	5.9	0.0	12.5
Approach LOS			B

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	362	0	443	0	0	0	0	1053	76	53	480	0
Future Volume (vph)	362	0	443	0	0	0	0	1053	76	53	480	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	0.99					1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1483	1484					3539	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.14	1.00	
Satd. Flow (perm)	1681	1483	1484					3539	1583	265	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	385	0	471	0	0	0	0	1239	89	60	539	0
RTOR Reduction (vph)	0	111	216	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	296	176	57	0	0	0	0	1239	43	60	539	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	16.8	16.8	16.8					39.1	39.1	50.8	50.8	
Effective Green, g (s)	16.8	16.8	16.8					39.1	39.1	50.8	50.8	
Actuated g/C Ratio	0.21	0.21	0.21					0.49	0.49	0.63	0.63	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	353	311	311					1729	773	267	2247	
v/s Ratio Prot								c0.35		0.01	c0.15	
v/s Ratio Perm	c0.18	0.12	0.04						0.03	0.13		
v/c Ratio	0.84	0.56	0.18					0.72	0.06	0.22	0.24	
Uniform Delay, d1	30.3	28.3	26.0					16.1	10.8	15.4	6.3	
Progression Factor	1.00	1.00	1.00					0.92	1.11	0.37	0.46	
Incremental Delay, d2	15.2	1.4	0.1					2.5	0.1	0.1	0.2	
Delay (s)	45.5	29.7	26.1					17.2	12.1	5.9	3.1	
Level of Service	D	C	C					B	B	A	A	
Approach Delay (s)		34.0			0.0			16.9			3.4	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	318	159	282	298	153	309	412	256	212	172	210
Future Volume (vph)	78	318	159	282	298	153	309	412	256	212	172	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3210		1703	3406	1524
Flt Permitted	0.40	1.00	1.00	0.36	1.00	1.00	0.64	1.00		0.20	1.00	1.00
Satd. Flow (perm)	733	1827	1553	677	1863	1583	1143	3210		359	3406	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	346	173	300	317	163	325	434	269	223	181	221
RTOR Reduction (vph)	0	0	125	0	0	113	0	107	0	0	0	165
Lane Group Flow (vph)	85	346	48	300	317	50	325	596	0	223	181	56
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	30.6	25.0	25.0	35.8	27.6	27.6	32.0	22.9		32.0	22.9	22.9
Effective Green, g (s)	30.6	25.0	25.0	35.8	27.6	27.6	32.0	22.9		32.0	22.9	22.9
Actuated g/C Ratio	0.34	0.28	0.28	0.40	0.31	0.31	0.36	0.25		0.36	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	311	507	431	368	571	485	463	816		263	866	387
v/s Ratio Prot	0.02	0.19		c0.07	0.17		0.07	0.19		c0.09	0.05	
v/s Ratio Perm	0.08		0.03	c0.25		0.03	0.18			c0.22		0.04
v/c Ratio	0.27	0.68	0.11	0.82	0.56	0.10	0.70	0.73		0.85	0.21	0.15
Uniform Delay, d1	27.0	29.0	24.2	29.5	26.1	22.3	26.2	30.7		32.7	26.4	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	7.3	0.5	13.0	3.9	0.4	4.8	5.7		21.6	0.5	0.8
Delay (s)	27.4	36.2	24.7	42.5	29.9	22.8	31.0	36.4		54.3	27.0	26.8
Level of Service	C	D	C	D	C	C	C	D		D	C	C
Approach Delay (s)		31.7			33.3			34.7			36.6	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	94	147	940	475	439	411
Future Volume (vph)	94	147	940	475	439	411
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.93	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3282	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3282	
Peak-hour factor, PHF	0.78	0.78	0.89	0.92	0.90	0.90
Adj. Flow (vph)	121	188	1056	516	488	457
RTOR Reduction (vph)	0	148	0	132	117	0
Lane Group Flow (vph)	121	40	1056	384	828	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	8.1	8.1	59.6	59.6	59.6	
Effective Green, g (s)	8.1	8.1	59.6	59.6	59.6	
Actuated g/C Ratio	0.10	0.10	0.75	0.75	0.75	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	179	160	2636	1179	2445	
v/s Ratio Prot	c0.07	0.03	c0.30		0.25	
v/s Ratio Perm				0.24		
v/c Ratio	0.68	0.25	0.40	0.33	0.34	
Uniform Delay, d1	34.7	33.1	3.7	3.4	3.5	
Progression Factor	1.00	1.00	0.10	0.04	4.79	
Incremental Delay, d2	7.7	0.3	0.3	0.5	0.3	
Delay (s)	42.4	33.4	0.7	0.7	17.0	
Level of Service	D	C	A	A	B	
Approach Delay (s)			0.7		17.0	
Approach LOS			A		B	

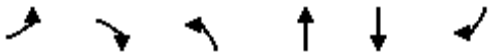
Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	336	104	64	346	256	80	377	67	296	365	176
Future Volume (vph)	96	336	104	64	346	256	80	377	67	296	365	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3459		1770	3367	
Flt Permitted	0.19	1.00	1.00	0.34	1.00	1.00	0.42	1.00		0.42	1.00	
Satd. Flow (perm)	355	1863	1583	642	1863	1583	790	3459		779	3367	
Peak-hour factor, PHF	0.95	0.95	0.95	0.76	0.76	0.76	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	101	354	109	84	455	337	107	503	89	318	392	189
RTOR Reduction (vph)	0	0	79	0	0	244	0	18	0	0	52	0
Lane Group Flow (vph)	101	354	30	84	455	93	107	574	0	318	529	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	97	512	435	176	512	435	454	1988		447	1936	
v/s Ratio Prot		0.19			0.24			0.17			0.16	
v/s Ratio Perm	c0.28		0.02	0.13		0.06	0.14			c0.41		
v/c Ratio	1.04	0.69	0.07	0.48	0.89	0.21	0.24	0.29		0.71	0.27	
Uniform Delay, d1	29.0	26.0	21.4	24.2	27.8	22.3	8.4	8.7		12.2	8.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.16	1.42	
Incremental Delay, d2	103.0	4.0	0.1	2.0	16.9	0.2	1.2	0.4		9.0	0.3	
Delay (s)	132.0	30.0	21.5	26.2	44.8	22.6	9.6	9.0		23.2	12.5	
Level of Service	F	C	C	C	D	C	A	A		C	B	
Approach Delay (s)		46.6			34.5			9.1			16.3	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	152	81	163	1054	804	211
Future Volume (vph)	152	81	163	1054	804	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1561	1770	3539	3429	
Flt Permitted	0.95	1.00	0.20	1.00	1.00	
Satd. Flow (perm)	1770	1561	364	3539	3429	
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.94	0.94
Adj. Flow (vph)	165	88	179	1158	855	224
RTOR Reduction (vph)	0	74	0	0	26	0
Lane Group Flow (vph)	165	14	179	1158	1054	0
Confl. Peds. (#/hr)		1				
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.7	12.7	55.0	55.0	40.0	
Effective Green, g (s)	12.7	12.7	55.0	55.0	40.0	
Actuated g/C Ratio	0.16	0.16	0.69	0.69	0.50	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	280	247	403	2433	1714	
v/s Ratio Prot	c0.09		0.05	c0.33	c0.31	
v/s Ratio Perm		0.01	0.26			
v/c Ratio	0.59	0.06	0.44	0.48	0.61	
Uniform Delay, d1	31.2	28.6	13.5	5.8	14.4	
Progression Factor	1.00	1.00	0.63	0.54	0.71	
Incremental Delay, d2	3.2	0.1	0.7	0.6	1.6	
Delay (s)	34.4	28.7	9.2	3.8	11.8	
Level of Service	C	C	A	A	B	
Approach Delay (s)	32.4			4.5	11.8	
Approach LOS	C			A	B	

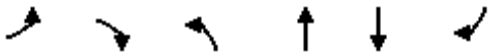
Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	46	1077	129	42	882
Future Volume (vph)	133	46	1077	129	42	882
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3482		1770	3539
Flt Permitted	0.95	1.00	1.00		0.15	1.00
Satd. Flow (perm)	1770	1583	3482		283	3539
Peak-hour factor, PHF	0.80	0.80	0.93	0.93	0.89	0.89
Adj. Flow (vph)	166	58	1158	139	47	991
RTOR Reduction (vph)	0	49	8	0	0	0
Lane Group Flow (vph)	166	9	1289	0	47	991
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.8	12.8	38.9		55.3	55.3
Effective Green, g (s)	12.8	12.8	38.9		55.3	55.3
Actuated g/C Ratio	0.16	0.16	0.49		0.69	0.69
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	283	253	1693		297	2446
v/s Ratio Prot	c0.09		c0.37		0.01	c0.28
v/s Ratio Perm		0.01			0.10	
v/c Ratio	0.59	0.04	0.76		0.16	0.41
Uniform Delay, d1	31.1	28.4	16.8		10.7	5.3
Progression Factor	1.00	1.00	0.77		1.00	1.00
Incremental Delay, d2	3.1	0.1	3.0		0.3	0.5
Delay (s)	34.2	28.5	15.9		11.0	5.8
Level of Service	C	C	B		B	A
Approach Delay (s)	32.7		15.9			6.0
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

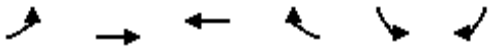
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	264	33	8	783	774	93
Future Volume (vph)	264	33	8	783	774	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3482	
Flt Permitted	0.95	1.00	0.29	1.00	1.00	
Satd. Flow (perm)	3433	1583	546	3539	3482	
Peak-hour factor, PHF	0.83	0.83	0.77	0.77	0.94	0.94
Adj. Flow (vph)	318	40	10	1017	823	99
RTOR Reduction (vph)	0	34	0	0	8	0
Lane Group Flow (vph)	318	6	10	1017	914	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	12.8	12.8	54.9	54.9	54.9	
Effective Green, g (s)	12.8	12.8	54.9	54.9	54.9	
Actuated g/C Ratio	0.16	0.16	0.69	0.69	0.69	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	549	253	374	2428	2389	
v/s Ratio Prot	c0.09			c0.29	0.26	
v/s Ratio Perm		0.00	0.02			
v/c Ratio	0.58	0.03	0.03	0.42	0.38	
Uniform Delay, d1	31.1	28.3	4.0	5.5	5.3	
Progression Factor	1.00	1.00	0.89	0.85	0.55	
Incremental Delay, d2	1.5	0.0	0.1	0.5	0.5	
Delay (s)	32.6	28.4	3.7	5.2	3.4	
Level of Service	C	C	A	A	A	
Approach Delay (s)	32.1			5.2	3.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

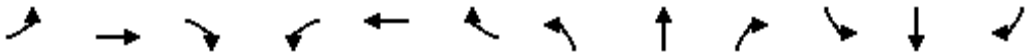
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	117	471	566	29	41	232
Future Volume (Veh/h)	117	471	566	29	41	232
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	124	501	596	31	46	261
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						8
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	627				1346	597
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	627				1346	597
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				68	48
cM capacity (veh/h)	955				145	502

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	124	501	596	31	307
Volume Left	124	0	0	0	46
Volume Right	0	0	0	31	261
cSH	955	1700	1700	1700	591
Volume to Capacity	0.13	0.29	0.35	0.02	0.52
Queue Length 95th (ft)	11	0	0	0	75
Control Delay (s)	9.3	0.0	0.0	0.0	22.8
Lane LOS	A				C
Approach Delay (s)	1.9		0.0		22.8
Approach LOS					C

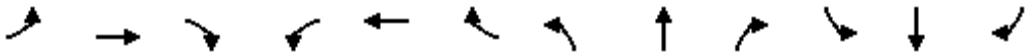
Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	0	67	5	0	8	91	696	4	3	725	79
Future Volume (Veh/h)	87	0	67	5	0	8	91	696	4	3	725	79
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.65	0.65	0.60	0.60	0.60	0.87	0.87	0.87	0.95	0.95	0.95
Hourly flow rate (vph)	134	0	103	8	0	13	105	800	5	3	763	83
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	1434	1826	423	1400	1864	404	846			805		
vC1, stage 1 conf vol	810	810		1012	1012							
vC2, stage 2 conf vol	624	1015		388	852							
vCu, unblocked vol	1302	1726	205	1265	1768	404	664			805		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	53	100	86	96	100	98	88			100		
cM capacity (veh/h)	283	234	739	211	212	596	849			815		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	237	21	105	533	272	3	509	337
Volume Left	134	8	105	0	0	3	0	0
Volume Right	103	13	0	0	5	0	0	83
cSH	501	351	849	1700	1700	815	1700	1700
Volume to Capacity	0.47	0.06	0.12	0.31	0.16	0.00	0.30	0.20
Queue Length 95th (ft)	63	5	11	0	0	0	0	0
Control Delay (s)	20.8	15.9	9.8	0.0	0.0	9.4	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	20.8	15.9	1.1			0.0		
Approach LOS	C	C						

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	48.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	5	45	40	1	80	13	988	46	63	782	78
Future Volume (Veh/h)	61	5	45	40	1	80	13	988	46	63	782	78
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.69	0.69	0.69	0.85	0.85	0.85	0.86	0.86	0.86
Hourly flow rate (vph)	84	7	62	58	1	116	15	1162	54	73	909	91
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.91	0.91	0.94	0.91	0.91	0.88	0.94			0.88		
vC, conflicting volume	1829	2348	501	1885	2366	608	1001			1216		
vC1, stage 1 conf vol	1102	1102		1219	1219							
vC2, stage 2 conf vol	728	1246		666	1147							
vCu, unblocked vol	1428	1998	347	1490	2018	287	878			977		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	55	96	90	70	99	81	98			88		
cM capacity (veh/h)	188	162	610	196	183	626	720			619		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	84	69	59	116	15	775	441	73	606	394
Volume Left	84	0	58	0	15	0	0	73	0	0
Volume Right	0	62	0	116	0	0	54	0	0	91
cSH	188	477	196	626	720	1700	1700	619	1700	1700
Volume to Capacity	0.45	0.14	0.30	0.19	0.02	0.46	0.26	0.12	0.36	0.23
Queue Length 95th (ft)	52	13	30	17	2	0	0	10	0	0
Control Delay (s)	38.7	13.8	31.1	12.1	10.1	0.0	0.0	11.6	0.0	0.0
Lane LOS	E	B	D	B	B			B		
Approach Delay (s)	27.5		18.5		0.1			0.8		
Approach LOS	D		C							

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	52.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	33	33	18	29	27	37
Future Volume (Veh/h)	33	33	18	29	27	37
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	55	55	23	37	37	51
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	168	42			60	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168	42			60	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	95			98	
cM capacity (veh/h)	802	1029			1544	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	110	60	88
Volume Left	55	0	37
Volume Right	55	37	0
cSH	902	1700	1544
Volume to Capacity	0.12	0.04	0.02
Queue Length 95th (ft)	10	0	2
Control Delay (s)	9.5	0.0	3.2
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	3.2
Approach LOS	A		

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	589	4	16	863	7	1	7	8	24	15	28
Future Volume (Veh/h)	27	589	4	16	863	7	1	7	8	24	15	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	28	620	4	20	1079	9	1	8	10	40	25	47
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1089			624			1861	1807	622	1816	1804	1084
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1089			624			1861	1807	622	1816	1804	1084
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			99	95	98	75	84	88
cM capacity (veh/h)	640			957			123	158	601	158	159	380

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	652	1108	19	112
Volume Left	28	20	1	40
Volume Right	4	9	10	47
cSH	640	957	252	209
Volume to Capacity	0.04	0.02	0.08	0.53
Queue Length 95th (ft)	3	2	6	70
Control Delay (s)	1.2	0.7	20.4	40.4
Lane LOS	A	A	C	E
Approach Delay (s)	1.2	0.7	20.4	40.4
Approach LOS			C	E

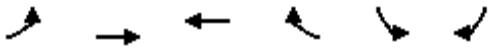
Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	202	21	43	307	20	31
Future Volume (Veh/h)	202	21	43	307	20	31
Sign Control	Stop			Stop	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	243	25	49	349	23	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	82	0	210	64	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82	0	210	64	0	
tC, single (s)	6.5	6.2	7.1	6.5	4.1	
tC, 2 stage (s)						
tF (s)	4.0	3.3	3.5	4.0	2.2	
p0 queue free %	70	98	91	57	99	
cM capacity (veh/h)	797	1085	551	815	1623	

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	268	398	59
Volume Left	0	49	23
Volume Right	25	0	36
cSH	817	770	1623
Volume to Capacity	0.33	0.52	0.01
Queue Length 95th (ft)	36	75	1
Control Delay (s)	11.5	14.6	2.9
Lane LOS	B	B	A
Approach Delay (s)	11.5	14.6	2.9
Approach LOS	B	B	

Intersection Summary			
Average Delay	12.5		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	99	139	225	112	95	140
Future Volume (Veh/h)	99	139	225	112	95	140
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.82	0.82	0.88	0.88
Hourly flow rate (vph)	111	156	274	137	108	159
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	411				720	342
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411				720	342
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				70	77
cM capacity (veh/h)	1148				356	700

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	267	411	267
Volume Left	111	0	108
Volume Right	0	137	159
cSH	1148	1700	504
Volume to Capacity	0.10	0.24	0.53
Queue Length 95th (ft)	8	0	77
Control Delay (s)	4.0	0.0	19.9
Lane LOS	A		C
Approach Delay (s)	4.0	0.0	19.9
Approach LOS			C

Intersection Summary			
Average Delay		6.8	
Intersection Capacity Utilization		55.3%	ICU Level of Service
Analysis Period (min)		15	

APPENDIX G-2

DORT HIGHWAY EXTENSION ALTERNATIVE A AND B INTERSECTIONS WITH ROUNDABOUTS AT I-75 RAMPS

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	446	705	182
Demand Flow Rate, veh/h	0	455	719	186
Vehicles Circulating, veh/h	186	216	186	51
Vehicles Exiting, veh/h	51	689	0	620
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	8.9	9.6	5.0
Approach LOS	-	A	A	A

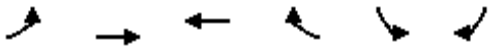
Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.112	0.888	0.300	0.700	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	51	404	216	503	186	0
Cap Entry Lane, veh/h	910	910	938	938	1074	1938
Entry HV Adj Factor	0.980	0.980	0.980	0.980	0.978	0.980
Flow Entry, veh/h	50	396	212	493	182	0
Cap Entry, veh/h	893	892	920	920	1051	1900
V/C Ratio	0.056	0.444	0.230	0.536	0.173	0.000
Control Delay, s/veh	4.6	9.4	6.2	11.0	5.0	0.0
LOS	A	A	A	B	A	A
95th %tile Queue, veh	0	2	1	3	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	39	5	13	24	214	5	128	14	524	99	5
Future Volume (Veh/h)	5	39	5	13	24	214	5	128	14	524	99	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	42	5	14	26	233	5	139	15	570	108	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1646	1414	110	1430	1410	146	113			154		
vC1, stage 1 conf vol	1250	1250		156	156							
vC2, stage 2 conf vol	395	164		1274	1253							
vCu, unblocked vol	1646	1414	110	1430	1410	146	113			154		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	80	99	93	89	75	100			60		
cM capacity (veh/h)	100	209	979	205	236	946	1476			1426		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	52	273	5	154	570	113
Volume Left	5	14	5	0	570	0
Volume Right	5	233	0	15	0	5
cSH	203	643	1476	1700	1426	1700
Volume to Capacity	0.26	0.42	0.00	0.09	0.40	0.07
Queue Length 95th (ft)	25	53	0	0	49	0
Control Delay (s)	28.7	14.7	7.4	0.0	9.2	0.0
Lane LOS	D	B	A		A	
Approach Delay (s)	28.7	14.7	0.2		7.7	
Approach LOS	D	B				

Intersection Summary				
Average Delay	9.2			
Intersection Capacity Utilization	64.1%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	120	693	333	23	88	34
Future Volume (Veh/h)	120	693	333	23	88	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	753	362	25	96	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	387				1388	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	387				1388	374
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				60	95
cM capacity (veh/h)	1171				242	763

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	130	753	387	96	37
Volume Left	130	0	0	96	0
Volume Right	0	0	25	0	37
cSH	1171	1700	1700	242	763
Volume to Capacity	0.11	0.44	0.23	0.40	0.05
Queue Length 95th (ft)	9	0	0	45	4
Control Delay (s)	8.5	0.0	0.0	29.3	10.0
Lane LOS	A			D	A
Approach Delay (s)	1.2		0.0	24.0	
Approach LOS				C	

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	87	13	14	80	5	10	297	40	10	601	10
Future Volume (Veh/h)	108	87	13	14	80	5	10	297	40	10	601	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	95	14	15	87	5	11	323	43	11	653	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1074	1068	658	1103	1052	344	664			366		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1074	1068	658	1103	1052	344	664			366		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	60	72	98	94	75	99	99			99		
cM capacity (veh/h)	293	340	580	272	346	785	925			1193		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	109	15	92	11	366	11	664
Volume Left	117	0	15	0	11	0	11	0
Volume Right	0	14	0	5	0	43	0	11
cSH	293	360	272	356	925	1700	1193	1700
Volume to Capacity	0.40	0.30	0.06	0.26	0.01	0.22	0.01	0.39
Queue Length 95th (ft)	46	31	4	25	1	0	1	0
Control Delay (s)	25.2	19.3	19.0	18.6	8.9	0.0	8.0	0.0
Lane LOS	D	C	C	C	A		A	
Approach Delay (s)	22.4		18.6		0.3		0.1	
Approach LOS	C		C					

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	51.6%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Intersection	
Intersection Delay, s/veh	4.8
Intersection LOS	A

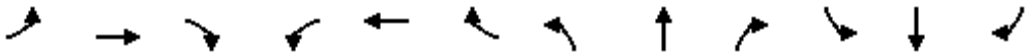
Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	68	607	931	0
Demand Flow Rate, veh/h	69	620	950	0
Vehicles Circulating, veh/h	336	305	69	336
Vehicles Exiting, veh/h	0	69	336	589
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.4	8.9	2.0	0.0
Approach LOS	A	A	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.542	0.458	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	69	0	336	284	305	645
Cap Entry Lane, veh/h	807	1938	833	833	1055	1938
Entry HV Adj Factor	0.986	0.980	0.980	0.979	0.980	0.980
Flow Entry, veh/h	68	0	329	278	299	632
Cap Entry, veh/h	796	1900	817	815	1034	1900
V/C Ratio	0.085	0.000	0.403	0.341	0.289	0.333
Control Delay, s/veh	5.4	0.0	9.4	8.4	6.3	0.0
LOS	A	A	A	A	A	A
95th %tile Queue, veh	0	0	2	2	1	1

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	533	677	129
Demand Flow Rate, veh/h	0	544	690	132
Vehicles Circulating, veh/h	132	418	132	52
Vehicles Exiting, veh/h	52	404	0	910
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	16.2	7.7	4.5
Approach LOS	-	C	A	A

Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.096	0.904	0.606	0.394	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	52	492	418	272	132	0
Cap Entry Lane, veh/h	744	744	990	990	1073	1938
Entry HV Adj Factor	0.981	0.980	0.980	0.982	0.977	0.980
Flow Entry, veh/h	51	482	410	267	129	0
Cap Entry, veh/h	730	729	971	972	1048	1900
V/C Ratio	0.070	0.661	0.422	0.275	0.123	0.000
Control Delay, s/veh	5.7	17.4	8.5	6.5	4.5	0.0
LOS	A	C	A	A	A	A
95th %tile Queue, veh	0	5	2	1	0	0

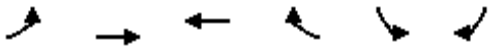


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	50	6	48	52	418	0	74	22	246	117	14
Future Volume (Veh/h)	0	50	6	48	52	418	0	74	22	246	117	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	7	52	57	454	0	80	24	267	127	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1231	772	134	787	768	92	142			104		
vC1, stage 1 conf vol	668	668		92	92							
vC2, stage 2 conf vol	562	104		695	676							
vCu, unblocked vol	1231	772	134	787	768	92	142			104		
tC, single (s)	7.1	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	6.1	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	88	99	89	88	54	100			82		
cM capacity (veh/h)	66	463	957	460	477	996	1441			1488		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	563	0	104	267	142
Volume Left	0	52	0	0	267	0
Volume Right	7	454	0	24	0	15
cSH	492	818	1700	1700	1488	1700
Volume to Capacity	0.12	0.69	0.00	0.06	0.18	0.08
Queue Length 95th (ft)	11	141	0	0	16	0
Control Delay (s)	13.3	18.5	0.0	0.0	7.9	0.0
Lane LOS	B	C			A	
Approach Delay (s)	13.3	18.5	0.0		5.2	
Approach LOS	B	C				

Intersection Summary				
Average Delay	11.8			
Intersection Capacity Utilization	64.8%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	93	505	793	5	83	87
Future Volume (Veh/h)	93	505	793	5	83	87
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	101	549	862	5	90	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	867				1616	864
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	867				1616	864
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				52	80
cM capacity (veh/h)	777				188	474

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	101	549	867	90	95
Volume Left	101	0	0	90	0
Volume Right	0	0	5	0	95
cSH	777	1700	1700	188	474
Volume to Capacity	0.13	0.32	0.51	0.48	0.20
Queue Length 95th (ft)	11	0	0	58	19
Control Delay (s)	10.3	0.0	0.0	40.7	14.5
Lane LOS	B			E	B
Approach Delay (s)	1.6		0.0	27.2	
Approach LOS				D	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	218	10	19	333	13	5	472	15	5	348	12
Future Volume (Veh/h)	5	218	10	19	333	13	5	472	15	5	348	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	237	11	21	362	14	5	513	16	5	378	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1112	934	384	1048	932	521	391			529		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1112	934	384	1048	932	521	391			529		
tC, single (s)	*4.2	*4.2	*4.2	*4.2	*4.2	*4.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	51	99	93	25	98	100			100		
cM capacity (veh/h)	172	481	823	289	481	744	1168			1038		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	248	21	376	5	529	5	391
Volume Left	5	0	21	0	5	0	5	0
Volume Right	0	11	0	14	0	16	0	13
cSH	172	490	289	488	1168	1700	1038	1700
Volume to Capacity	0.03	0.51	0.07	0.77	0.00	0.31	0.00	0.23
Queue Length 95th (ft)	2	70	6	170	0	0	0	0
Control Delay (s)	26.6	19.6	18.4	33.0	8.1	0.0	8.5	0.0
Lane LOS	D	C	C	D	A		A	
Approach Delay (s)	19.8		32.3		0.1		0.1	
Approach LOS	C		D					

Intersection Summary				
Average Delay	11.3			
Intersection Capacity Utilization	50.7%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	16	892	666	0
Demand Flow Rate, veh/h	16	909	680	0
Vehicles Circulating, veh/h	428	231	16	428
Vehicles Exiting, veh/h	0	16	428	712
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	10.8	1.8	0.0
Approach LOS	A	B	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.471	0.529	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	16	0	428	481	231	449
Cap Entry Lane, veh/h	737	1938	897	897	1112	1938
Entry HV Adj Factor	1.000	0.980	0.980	0.981	0.978	0.980
Flow Entry, veh/h	16	0	420	472	226	440
Cap Entry, veh/h	737	1900	879	880	1088	1900
V/C Ratio	0.022	0.000	0.477	0.536	0.208	0.232
Control Delay, s/veh	5.1	0.0	10.2	11.4	5.2	0.0
LOS	A	A	B	B	A	A
95th %tile Queue, veh	0	0	3	3	1	1

APPENDIX G-3

DORT HIGHWAY EXTENSION ALTERNATIVE A AND B INTERSECTIONS WITH STOP SIGNS

Movement	EBL	EBR	NBL	NBR	SEL	SER	SWL	SWR	SWR2
Lane Configurations									
Sign Control	Stop		Stop		Stop		Stop		
Traffic Volume (vph)	195	454	46	364	0	0	167	0	477
Future Volume (vph)	195	454	46	364	0	0	167	0	477
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	212	493	50	396	0	0	182	0	518

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SW 1	SW 2
Volume Total (vph)	212	493	50	396	182	518
Volume Left (vph)	0	0	0	0	182	0
Volume Right (vph)	0	493	0	396	0	518
Hadj (s)	0.03	-0.67	0.03	-0.67	0.23	-0.57
Departure Headway (s)	6.3	5.6	6.8	6.1	7.0	3.2
Degree Utilization, x	0.37	0.76	0.09	0.67	0.36	0.46
Capacity (veh/h)	554	629	506	564	485	1116
Control Delay (s)	11.7	23.0	9.3	19.2	13.9	8.9
Approach Delay (s)	19.6		18.1		10.2	
Approach LOS	C		C		B	

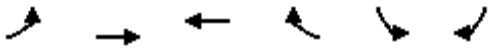
Intersection Summary				
Delay	15.7			
Level of Service	C			
Intersection Capacity Utilization	33.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	39	5	13	24	214	5	128	14	524	99	5
Future Volume (Veh/h)	5	39	5	13	24	214	5	128	14	524	99	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	42	5	14	26	233	5	139	15	570	108	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1646	1414	110	1430	1410	146	113			154		
vC1, stage 1 conf vol	1250	1250		156	156							
vC2, stage 2 conf vol	395	164		1274	1253							
vCu, unblocked vol	1646	1414	110	1430	1410	146	113			154		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	80	99	93	89	75	100			60		
cM capacity (veh/h)	100	209	979	205	236	946	1476			1426		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	52	273	5	154	570	113
Volume Left	5	14	5	0	570	0
Volume Right	5	233	0	15	0	5
cSH	203	643	1476	1700	1426	1700
Volume to Capacity	0.26	0.42	0.00	0.09	0.40	0.07
Queue Length 95th (ft)	25	53	0	0	49	0
Control Delay (s)	28.7	14.7	7.4	0.0	9.2	0.0
Lane LOS	D	B	A		A	
Approach Delay (s)	28.7	14.7	0.2		7.7	
Approach LOS	D	B				

Intersection Summary				
Average Delay	9.2			
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			

* User Entered Value

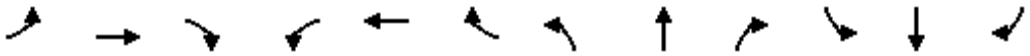


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	120	693	333	23	88	34
Future Volume (Veh/h)	120	693	333	23	88	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	753	362	25	96	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	387				1388	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	387				1388	374
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				60	95
cM capacity (veh/h)	1171				242	763

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	130	753	387	96	37
Volume Left	130	0	0	96	0
Volume Right	0	0	25	0	37
cSH	1171	1700	1700	242	763
Volume to Capacity	0.11	0.44	0.23	0.40	0.05
Queue Length 95th (ft)	9	0	0	45	4
Control Delay (s)	8.5	0.0	0.0	29.3	10.0
Lane LOS	A			D	A
Approach Delay (s)	1.2		0.0	24.0	
Approach LOS				C	

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

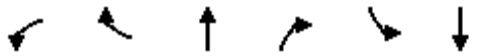


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	87	13	14	80	5	10	297	40	10	601	10
Future Volume (Veh/h)	108	87	13	14	80	5	10	297	40	10	601	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	95	14	15	87	5	11	323	43	11	653	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1074	1068	658	1103	1052	344	664			366		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1074	1068	658	1103	1052	344	664			366		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	60	72	98	94	75	99	99			99		
cM capacity (veh/h)	293	340	580	272	346	785	925			1193		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	109	15	92	11	366	11	664
Volume Left	117	0	15	0	11	0	11	0
Volume Right	0	14	0	5	0	43	0	11
cSH	293	360	272	356	925	1700	1193	1700
Volume to Capacity	0.40	0.30	0.06	0.26	0.01	0.22	0.01	0.39
Queue Length 95th (ft)	46	31	4	25	1	0	1	0
Control Delay (s)	25.2	19.3	19.0	18.6	8.9	0.0	8.0	0.0
Lane LOS	D	C	C	C	A		A	
Approach Delay (s)	22.4		18.6		0.3		0.1	
Approach LOS	C		C					

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	51.6%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	63	0	303	256	275	581
Future Volume (Veh/h)	63	0	303	256	275	581
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	0	329	278	299	632
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1559	329			607	
vC1, stage 1 conf vol	329					
vC2, stage 2 conf vol	1230					
vCu, unblocked vol	1559	329			607	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	63	100			69	
cM capacity (veh/h)	184	712			971	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	68	329	278	299	632
Volume Left	68	0	0	299	0
Volume Right	0	0	278	0	0
cSH	184	1700	1700	971	1700
Volume to Capacity	0.37	0.19	0.16	0.31	0.37
Queue Length 95th (ft)	40	0	0	33	0
Control Delay (s)	35.6	0.0	0.0	10.3	0.0
Lane LOS	E			B	
Approach Delay (s)	35.6	0.0		3.3	
Approach LOS	E				

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBR	SEL	SER	SWL	SWR	SWR2
Lane Configurations									
Sign Control	Stop		Stop		Stop		Stop		
Traffic Volume (vph)	377	246	47	443	0	0	119	0	301
Future Volume (vph)	377	246	47	443	0	0	119	0	301
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	410	267	51	482	0	0	129	0	327

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SW 1	SW 2
Volume Total (vph)	410	267	51	482	129	327
Volume Left (vph)	0	0	0	0	129	0
Volume Right (vph)	0	267	0	482	0	327
Hadj (s)	0.03	-0.67	0.03	-0.67	0.23	-0.57
Departure Headway (s)	6.4	5.7	6.7	6.0	7.3	3.2
Degree Utilization, x	0.73	0.42	0.09	0.80	0.26	0.29
Capacity (veh/h)	540	607	518	587	462	1113
Control Delay (s)	23.9	11.7	9.2	27.2	12.9	7.5
Approach Delay (s)	19.1		25.5		9.0	
Approach LOS	C		D		A	

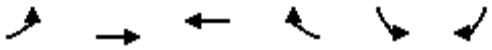
Intersection Summary				
Delay	18.4			
Level of Service	C			
Intersection Capacity Utilization	40.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	50	6	48	52	418	0	74	22	246	117	14
Future Volume (Veh/h)	0	50	6	48	52	418	0	74	22	246	117	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	7	52	57	454	0	80	24	267	127	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1231	772	134	787	768	92	142			104		
vC1, stage 1 conf vol	668	668		92	92							
vC2, stage 2 conf vol	562	104		695	676							
vCu, unblocked vol	1231	772	134	787	768	92	142			104		
tC, single (s)	7.1	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	6.1	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	88	99	89	88	54	100			82		
cM capacity (veh/h)	66	463	957	460	477	996	1441			1488		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	563	0	104	267	142
Volume Left	0	52	0	0	267	0
Volume Right	7	454	0	24	0	15
cSH	492	818	1700	1700	1488	1700
Volume to Capacity	0.12	0.69	0.00	0.06	0.18	0.08
Queue Length 95th (ft)	11	141	0	0	16	0
Control Delay (s)	13.3	18.5	0.0	0.0	7.9	0.0
Lane LOS	B	C			A	
Approach Delay (s)	13.3	18.5	0.0		5.2	
Approach LOS	B	C				

Intersection Summary				
Average Delay	11.8			
Intersection Capacity Utilization	64.8%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value

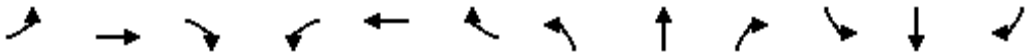


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	93	505	793	5	83	87
Future Volume (Veh/h)	93	505	793	5	83	87
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	101	549	862	5	90	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	867				1616	864
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	867				1616	864
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				52	80
cM capacity (veh/h)	777				188	474

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	101	549	867	90	95
Volume Left	101	0	0	90	0
Volume Right	0	0	5	0	95
cSH	777	1700	1700	188	474
Volume to Capacity	0.13	0.32	0.51	0.48	0.20
Queue Length 95th (ft)	11	0	0	58	19
Control Delay (s)	10.3	0.0	0.0	40.7	14.5
Lane LOS	B			E	B
Approach Delay (s)	1.6		0.0	27.2	
Approach LOS				D	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

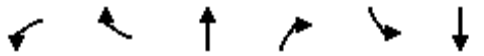


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	218	10	19	333	13	5	472	15	5	348	12
Future Volume (Veh/h)	5	218	10	19	333	13	5	472	15	5	348	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	237	11	21	362	14	5	513	16	5	378	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1112	934	384	1048	932	521	391			529		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1112	934	384	1048	932	521	391			529		
tC, single (s)	*4.2	*4.2	*4.2	*4.2	*4.2	*4.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	51	99	93	25	98	100			100		
cM capacity (veh/h)	172	481	823	289	481	744	1168			1038		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	248	21	376	5	529	5	391
Volume Left	5	0	21	0	5	0	5	0
Volume Right	0	11	0	14	0	16	0	13
cSH	172	490	289	488	1168	1700	1038	1700
Volume to Capacity	0.03	0.51	0.07	0.77	0.00	0.31	0.00	0.23
Queue Length 95th (ft)	2	70	6	170	0	0	0	0
Control Delay (s)	26.6	19.6	18.4	33.0	8.1	0.0	8.5	0.0
Lane LOS	D	C	C	D	A		A	
Approach Delay (s)	19.8		32.3		0.1		0.1	
Approach LOS	C		D					

Intersection Summary				
Average Delay	11.3			
Intersection Capacity Utilization	50.7%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	0	386	434	208	405
Future Volume (Veh/h)	15	0	386	434	208	405
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	420	472	226	440
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1312	420			892	
vC1, stage 1 conf vol	420					
vC2, stage 2 conf vol	892					
vCu, unblocked vol	1312	420			892	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	100			70	
cM capacity (veh/h)	265	633			760	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	420	472	226	440
Volume Left	16	0	0	226	0
Volume Right	0	0	472	0	0
cSH	265	1700	1700	760	1700
Volume to Capacity	0.06	0.25	0.28	0.30	0.26
Queue Length 95th (ft)	5	0	0	31	0
Control Delay (s)	19.5	0.0	0.0	11.7	0.0
Lane LOS	C			B	
Approach Delay (s)	19.5	0.0		4.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX G-4

DORT HIGHWAY EXTENSION ALTERNATIVE C INTERSECTIONS ON MCWAIN ROAD WITH ROUNDABOUTS AT I-75 RAMPS

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	446	705	182
Demand Flow Rate, veh/h	0	455	719	186
Vehicles Circulating, veh/h	186	216	186	51
Vehicles Exiting, veh/h	51	689	0	620
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	8.9	9.6	5.0
Approach LOS	-	A	A	A

Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.112	0.888	0.300	0.700	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	51	404	216	503	186	0
Cap Entry Lane, veh/h	910	910	938	938	1074	1938
Entry HV Adj Factor	0.980	0.980	0.980	0.980	0.978	0.980
Flow Entry, veh/h	50	396	212	493	182	0
Cap Entry, veh/h	893	892	920	920	1051	1900
V/C Ratio	0.056	0.444	0.230	0.536	0.173	0.000
Control Delay, s/veh	4.6	9.4	6.2	11.0	5.0	0.0
LOS	A	A	A	B	A	A
95th %tile Queue, veh	0	2	1	3	1	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	227	151	40	541	123
Future Volume (Veh/h)	24	227	151	40	541	123
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	37	349	232	62	741	168
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1914	264			295	
vC1, stage 1 conf vol	264					
vC2, stage 2 conf vol	1650					
vCu, unblocked vol	1914	264			295	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	59			41	
cM capacity (veh/h)	133	846			1265	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	386	294	741	168
Volume Left	37	0	741	0
Volume Right	349	62	0	0
cSH	559	1700	1265	1700
Volume to Capacity	0.69	0.17	0.59	0.10
Queue Length 95th (ft)	134	0	100	0
Control Delay (s)	24.6	0.0	11.8	0.0
Lane LOS	C		B	
Approach Delay (s)	24.6	0.0	9.6	
Approach LOS	C			

Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	660	0	1	340	26	3	11	8	94	1	43
Future Volume (Veh/h)	145	660	0	1	340	26	3	11	8	94	1	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	177	805	0	1	420	32	4	16	12	102	1	47
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	455			806			1630	1617	806	1620	1601	440
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	455			806			1630	1617	806	1620	1601	440
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			100			98	91	98	40	99	93
cM capacity (veh/h)	1103			818			172	171	501	170	174	714

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	177	805	1	452	32	102	48
Volume Left	177	0	1	0	4	102	0
Volume Right	0	0	0	32	12	0	47
cSH	1103	1700	818	1700	228	170	670
Volume to Capacity	0.16	0.47	0.00	0.27	0.14	0.60	0.07
Queue Length 95th (ft)	14	0	0	0	12	81	6
Control Delay (s)	8.9	0.0	9.4	0.0	23.4	53.8	10.8
Lane LOS	A		A		C	F	B
Approach Delay (s)	1.6		0.0		23.4	40.0	
Approach LOS					C	E	

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	60.0%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	72	39	24	70	5	26	297	55	10	601	10
Future Volume (Veh/h)	108	72	39	24	70	5	26	297	55	10	601	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.86	0.86	0.83	0.83	0.92	0.60	0.92	0.60	0.92	0.92	0.92
Hourly flow rate (vph)	117	84	45	29	84	5	43	323	92	11	653	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1136	1182	658	1217	1141	369	664			415		
vC1, stage 1 conf vol	680	680		455	455							
vC2, stage 2 conf vol	456	501		762	686							
vCu, unblocked vol	1136	1182	658	1217	1141	369	664			415		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	83	92	93	83	99	95			99		
cM capacity (veh/h)	507	493	580	414	484	767	925			1144		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	129	29	89	43	415	11	664
Volume Left	117	0	29	0	43	0	11	0
Volume Right	0	45	0	5	0	92	0	11
cSH	507	520	414	494	925	1700	1144	1700
Volume to Capacity	0.23	0.25	0.07	0.18	0.05	0.24	0.01	0.39
Queue Length 95th (ft)	22	24	6	16	4	0	1	0
Control Delay (s)	14.2	14.2	14.3	13.9	9.1	0.0	8.2	0.0
Lane LOS	B	B	B	B	A		A	
Approach Delay (s)	14.2		14.0		0.9		0.1	
Approach LOS	B		B					

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	51.6%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Intersection	
Intersection Delay, s/veh	4.8
Intersection LOS	A

Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	68	607	931	0
Demand Flow Rate, veh/h	69	620	950	0
Vehicles Circulating, veh/h	336	305	69	336
Vehicles Exiting, veh/h	0	69	336	589
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.4	8.9	2.0	0.0
Approach LOS	A	A	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.542	0.458	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	69	0	336	284	305	645
Cap Entry Lane, veh/h	807	1938	833	833	1055	1938
Entry HV Adj Factor	0.986	0.980	0.980	0.979	0.980	0.980
Flow Entry, veh/h	68	0	329	278	299	632
Cap Entry, veh/h	796	1900	817	815	1034	1900
V/C Ratio	0.085	0.000	0.403	0.341	0.289	0.333
Control Delay, s/veh	5.4	0.0	9.4	8.4	6.3	0.0
LOS	A	A	A	A	A	A
95th %tile Queue, veh	0	0	2	2	1	1

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	533	677	129
Demand Flow Rate, veh/h	0	544	690	132
Vehicles Circulating, veh/h	132	418	132	52
Vehicles Exiting, veh/h	52	404	0	910
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	16.2	7.7	4.5
Approach LOS	-	C	A	A

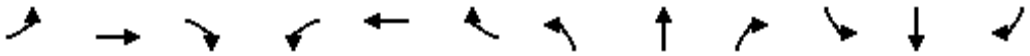
Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.096	0.904	0.606	0.394	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	52	492	418	272	132	0
Cap Entry Lane, veh/h	744	744	990	990	1073	1938
Entry HV Adj Factor	0.981	0.980	0.980	0.982	0.977	0.980
Flow Entry, veh/h	51	482	410	267	129	0
Cap Entry, veh/h	730	729	971	972	1048	1900
V/C Ratio	0.070	0.661	0.422	0.275	0.123	0.000
Control Delay, s/veh	5.7	17.4	8.5	6.5	4.5	0.0
LOS	A	C	A	A	A	A
95th %tile Queue, veh	0	5	2	1	0	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	67	451	92	53	267	174
Future Volume (Veh/h)	67	451	92	53	267	174
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	112	752	118	68	366	238
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1123	152			186	
vC1, stage 1 conf vol	152					
vC2, stage 2 conf vol	971					
vCu, unblocked vol	1123	152			186	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	20			74	
cM capacity (veh/h)	383	941			1388	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	864	186	366	238
Volume Left	112	0	366	0
Volume Right	752	68	0	0
cSH	792	1700	1388	1700
Volume to Capacity	1.09	0.11	0.26	0.14
Queue Length 95th (ft)	577	0	27	0
Control Delay (s)	81.7	0.0	8.5	0.0
Lane LOS	F		A	
Approach Delay (s)	81.7	0.0	5.2	
Approach LOS	F			

Intersection Summary			
Average Delay	44.6		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

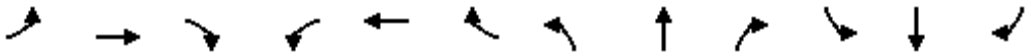


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	505	4	16	776	12	1	7	8	108	15	115
Future Volume (Veh/h)	120	505	4	16	776	12	1	7	8	108	15	115
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	126	532	4	20	970	15	1	8	10	180	25	192
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	986			536			2000	1812	534	1816	1806	978
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	986			536			2000	1812	534	1816	1806	978
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	82			98			98	94	98	0	82	55
cM capacity (veh/h)	700			1032			58	135	654	140	136	423

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	126	536	20	985	19	180	217
Volume Left	126	0	20	0	1	180	0
Volume Right	0	4	0	15	10	0	192
cSH	700	1700	1032	1700	207	140	340
Volume to Capacity	0.18	0.32	0.02	0.58	0.09	1.28	0.64
Queue Length 95th (ft)	16	0	1	0	7	277	104
Control Delay (s)	11.3	0.0	8.6	0.0	24.1	232.4	32.5
Lane LOS	B		A		C	F	D
Approach Delay (s)	2.1		0.2		24.1	123.1	
Approach LOS					C	F	

Intersection Summary				
Average Delay	24.4			
Intersection Capacity Utilization	70.9%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	187	31	62	290	13	25	472	46	5	348	12
Future Volume (Veh/h)	5	187	31	62	290	13	25	472	46	5	348	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.83	0.83	0.88	0.88	0.92	0.86	0.92	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	5	225	37	70	330	14	29	513	53	5	378	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1144	1018	384	1135	998	540	391			566		
vC1, stage 1 conf vol	394	394		598	598							
vC2, stage 2 conf vol	750	624		538	401							
vCu, unblocked vol	1144	1018	384	1135	998	540	391			566		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	58	95	82	38	98	98			100		
cM capacity (veh/h)	264	534	755	400	536	651	1168			1006		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	262	70	344	29	566	5	391
Volume Left	5	0	70	0	29	0	5	0
Volume Right	0	37	0	14	0	53	0	13
cSH	264	557	400	540	1168	1700	1006	1700
Volume to Capacity	0.02	0.47	0.18	0.64	0.02	0.33	0.00	0.23
Queue Length 95th (ft)	1	62	16	111	2	0	0	0
Control Delay (s)	18.9	17.1	15.9	22.7	8.2	0.0	8.6	0.0
Lane LOS	C	C	C	C	A		A	
Approach Delay (s)	17.1		21.5		0.4		0.1	
Approach LOS	C		C					

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	57.0%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

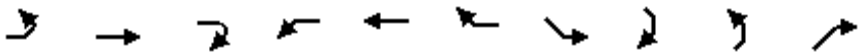
Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	16	892	666	0
Demand Flow Rate, veh/h	16	909	680	0
Vehicles Circulating, veh/h	428	231	16	428
Vehicles Exiting, veh/h	0	16	428	712
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	10.8	1.8	0.0
Approach LOS	A	B	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.471	0.529	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	16	0	428	481	231	449
Cap Entry Lane, veh/h	737	1938	897	897	1112	1938
Entry HV Adj Factor	1.000	0.980	0.980	0.981	0.978	0.980
Flow Entry, veh/h	16	0	420	472	226	440
Cap Entry, veh/h	737	1900	879	880	1088	1900
V/C Ratio	0.022	0.000	0.477	0.536	0.208	0.232
Control Delay, s/veh	5.1	0.0	10.2	11.4	5.2	0.0
LOS	A	A	B	B	A	A
95th %tile Queue, veh	0	0	3	3	1	1

APPENDIX G-5

DORT HIGHWAY EXTENSION ALTERNATIVE C INTERSECTIONS ON MCWAIN ROAD WITH STOP SIGNS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SER	NEL	NER
Lane Configurations										
Sign Control		Stop			Stop		Stop		Stop	
Traffic Volume (vph)	0	195	454	167	0	477	0	0	46	364
Future Volume (vph)	0	195	454	167	0	477	0	0	46	364
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	212	493	182	0	518	0	0	50	396

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NE 1	NE 2
Volume Total (vph)	212	493	182	518	50	396
Volume Left (vph)	0	0	182	0	0	0
Volume Right (vph)	0	493	0	518	0	396
Hadj (s)	0.03	-0.67	0.23	-0.57	0.03	-0.67
Departure Headway (s)	6.3	5.6	7.0	3.2	6.8	6.1
Degree Utilization, x	0.37	0.76	0.36	0.46	0.09	0.67
Capacity (veh/h)	554	629	485	1116	506	564
Control Delay (s)	11.7	23.0	13.9	8.9	9.3	19.2
Approach Delay (s)	19.6		10.2		18.1	
Approach LOS	C		B		C	

Intersection Summary				
Delay	15.7			
Level of Service	C			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	227	151	40	541	123
Future Volume (Veh/h)	24	227	151	40	541	123
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	37	349	232	62	741	168
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1914	264			295	
vC1, stage 1 conf vol	264					
vC2, stage 2 conf vol	1650					
vCu, unblocked vol	1914	264			295	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	59			41	
cM capacity (veh/h)	133	846			1265	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	386	294	741	168
Volume Left	37	0	741	0
Volume Right	349	62	0	0
cSH	559	1700	1265	1700
Volume to Capacity	0.69	0.17	0.59	0.10
Queue Length 95th (ft)	134	0	100	0
Control Delay (s)	24.6	0.0	11.8	0.0
Lane LOS	C		B	
Approach Delay (s)	24.6	0.0	9.6	
Approach LOS	C			

Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

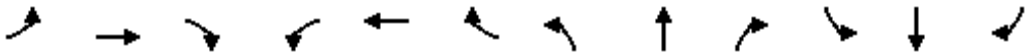
* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	660	0	1	340	26	3	11	8	94	1	43
Future Volume (Veh/h)	145	660	0	1	340	26	3	11	8	94	1	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	177	805	0	1	420	32	4	16	12	102	1	47
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	455			806			1630	1617	806	1620	1601	440
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	455			806			1630	1617	806	1620	1601	440
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			100			98	91	98	40	99	93
cM capacity (veh/h)	1103			818			172	171	501	170	174	714

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	177	805	1	452	32	102	48
Volume Left	177	0	1	0	4	102	0
Volume Right	0	0	0	32	12	0	47
cSH	1103	1700	818	1700	228	170	670
Volume to Capacity	0.16	0.47	0.00	0.27	0.14	0.60	0.07
Queue Length 95th (ft)	14	0	0	0	12	81	6
Control Delay (s)	8.9	0.0	9.4	0.0	23.4	53.8	10.8
Lane LOS	A		A		C	F	B
Approach Delay (s)	1.6		0.0		23.4	40.0	
Approach LOS					C	E	

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	60.0%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

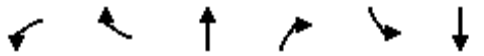


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	72	39	24	70	5	26	297	55	10	601	10
Future Volume (Veh/h)	108	72	39	24	70	5	26	297	55	10	601	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.86	0.86	0.83	0.83	0.92	0.60	0.92	0.60	0.92	0.92	0.92
Hourly flow rate (vph)	117	84	45	29	84	5	43	323	92	11	653	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1136	1182	658	1217	1141	369	664			415		
vC1, stage 1 conf vol	680	680		455	455							
vC2, stage 2 conf vol	456	501		762	686							
vCu, unblocked vol	1136	1182	658	1217	1141	369	664			415		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	83	92	93	83	99	95			99		
cM capacity (veh/h)	507	493	580	414	484	767	925			1144		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	129	29	89	43	415	11	664
Volume Left	117	0	29	0	43	0	11	0
Volume Right	0	45	0	5	0	92	0	11
cSH	507	520	414	494	925	1700	1144	1700
Volume to Capacity	0.23	0.25	0.07	0.18	0.05	0.24	0.01	0.39
Queue Length 95th (ft)	22	24	6	16	4	0	1	0
Control Delay (s)	14.2	14.2	14.3	13.9	9.1	0.0	8.2	0.0
Lane LOS	B	B	B	B	A		A	
Approach Delay (s)	14.2		14.0		0.9		0.1	
Approach LOS	B		B					

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	51.6%	ICU Level of Service		A
Analysis Period (min)	15			

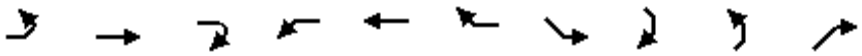
* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	63	0	303	256	275	581
Future Volume (Veh/h)	63	0	303	256	275	581
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	0	329	278	299	632
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1559	329			607	
vC1, stage 1 conf vol	329					
vC2, stage 2 conf vol	1230					
vCu, unblocked vol	1559	329			607	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	63	100			69	
cM capacity (veh/h)	184	712			971	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	68	329	278	299	632
Volume Left	68	0	0	299	0
Volume Right	0	0	278	0	0
cSH	184	1700	1700	971	1700
Volume to Capacity	0.37	0.19	0.16	0.31	0.37
Queue Length 95th (ft)	40	0	0	33	0
Control Delay (s)	35.6	0.0	0.0	10.3	0.0
Lane LOS	E			B	
Approach Delay (s)	35.6	0.0		3.3	
Approach LOS	E				

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SER	NEL	NER
Lane Configurations										
Sign Control		Stop			Stop		Stop		Stop	
Traffic Volume (vph)	0	377	246	119	0	301	0	0	47	443
Future Volume (vph)	0	377	246	119	0	301	0	0	47	443
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	410	267	129	0	327	0	0	51	482

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NE 1	NE 2
Volume Total (vph)	410	267	129	327	51	482
Volume Left (vph)	0	0	129	0	0	0
Volume Right (vph)	0	267	0	327	0	482
Hadj (s)	0.03	-0.67	0.23	-0.57	0.03	-0.67
Departure Headway (s)	6.4	5.7	7.3	3.2	6.7	6.0
Degree Utilization, x	0.73	0.42	0.26	0.29	0.09	0.80
Capacity (veh/h)	540	607	462	1113	518	587
Control Delay (s)	23.9	11.7	12.9	7.5	9.2	27.2
Approach Delay (s)	19.1		9.0		25.5	
Approach LOS	C		A		D	

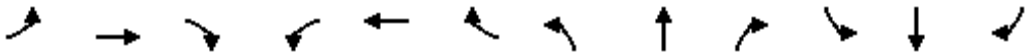
Intersection Summary				
Delay	18.4			
Level of Service	C			
Intersection Capacity Utilization	53.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	67	451	92	53	267	174
Future Volume (Veh/h)	67	451	92	53	267	174
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	112	752	118	68	366	238
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1123	152			186	
vC1, stage 1 conf vol	152					
vC2, stage 2 conf vol	971					
vCu, unblocked vol	1123	152			186	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	20			74	
cM capacity (veh/h)	383	941			1388	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	864	186	366	238
Volume Left	112	0	366	0
Volume Right	752	68	0	0
cSH	792	1700	1388	1700
Volume to Capacity	1.09	0.11	0.26	0.14
Queue Length 95th (ft)	577	0	27	0
Control Delay (s)	81.7	0.0	8.5	0.0
Lane LOS	F		A	
Approach Delay (s)	81.7	0.0	5.2	
Approach LOS	F			

Intersection Summary			
Average Delay	44.6		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

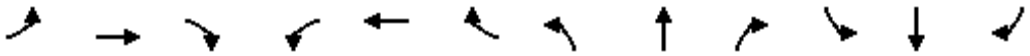


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	505	4	16	776	12	1	7	8	108	15	115
Future Volume (Veh/h)	120	505	4	16	776	12	1	7	8	108	15	115
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	126	532	4	20	970	15	1	8	10	180	25	192
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	986			536			2000	1812	534	1816	1806	978
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	986			536			2000	1812	534	1816	1806	978
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	82			98			98	94	98	0	82	55
cM capacity (veh/h)	700			1032			58	135	654	140	136	423

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	126	536	20	985	19	180	217
Volume Left	126	0	20	0	1	180	0
Volume Right	0	4	0	15	10	0	192
cSH	700	1700	1032	1700	207	140	340
Volume to Capacity	0.18	0.32	0.02	0.58	0.09	1.28	0.64
Queue Length 95th (ft)	16	0	1	0	7	277	104
Control Delay (s)	11.3	0.0	8.6	0.0	24.1	232.4	32.5
Lane LOS	B		A		C	F	D
Approach Delay (s)	2.1		0.2		24.1	123.1	
Approach LOS					C	F	

Intersection Summary				
Average Delay	24.4			
Intersection Capacity Utilization	70.9%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value

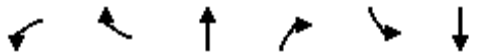


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	187	31	62	290	13	25	472	46	5	348	12
Future Volume (Veh/h)	5	187	31	62	290	13	25	472	46	5	348	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.83	0.83	0.88	0.88	0.92	0.86	0.92	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	5	225	37	70	330	14	29	513	53	5	378	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1144	1018	384	1135	998	540	391			566		
vC1, stage 1 conf vol	394	394		598	598							
vC2, stage 2 conf vol	750	624		538	401							
vCu, unblocked vol	1144	1018	384	1135	998	540	391			566		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	58	95	82	38	98	98			100		
cM capacity (veh/h)	264	534	755	400	536	651	1168			1006		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	262	70	344	29	566	5	391
Volume Left	5	0	70	0	29	0	5	0
Volume Right	0	37	0	14	0	53	0	13
cSH	264	557	400	540	1168	1700	1006	1700
Volume to Capacity	0.02	0.47	0.18	0.64	0.02	0.33	0.00	0.23
Queue Length 95th (ft)	1	62	16	111	2	0	0	0
Control Delay (s)	18.9	17.1	15.9	22.7	8.2	0.0	8.6	0.0
Lane LOS	C	C	C	C	A		A	
Approach Delay (s)	17.1		21.5		0.4		0.1	
Approach LOS	C		C					

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	57.0%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value



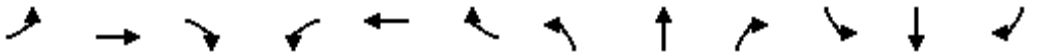
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	0	386	434	208	405
Future Volume (Veh/h)	15	0	386	434	208	405
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	420	472	226	440
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1312	420			892	
vC1, stage 1 conf vol	420					
vC2, stage 2 conf vol	892					
vCu, unblocked vol	1312	420			892	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	100			70	
cM capacity (veh/h)	265	633			760	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	420	472	226	440
Volume Left	16	0	0	226	0
Volume Right	0	0	472	0	0
cSH	265	1700	1700	760	1700
Volume to Capacity	0.06	0.25	0.28	0.30	0.26
Queue Length 95th (ft)	5	0	0	31	0
Control Delay (s)	19.5	0.0	0.0	11.7	0.0
Lane LOS	C			B	
Approach Delay (s)	19.5	0.0		4.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX H

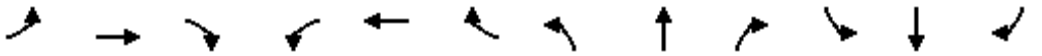
2020 NO-BUILD CAPACITY REPORT



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1	842	0	0	0	0	1101	124	102	706	0
Future Volume (vph)	290	1	842	0	0	0	0	1101	124	102	706	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frt	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1454	1504					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.10	1.00	
Satd. Flow (perm)	1681	1454	1504					3539	1583	190	3539	
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	367	1	1066	0	0	0	0	1359	153	126	872	0
RTOR Reduction (vph)	0	99	99	0	0	0	0	0	90	0	0	0
Lane Group Flow (vph)	330	451	455	0	0	0	0	1359	63	126	872	0
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	23.0	23.0	23.0					32.9	32.9	44.6	44.6	
Effective Green, g (s)	23.0	23.0	23.0					32.9	32.9	44.6	44.6	
Actuated g/C Ratio	0.29	0.29	0.29					0.41	0.41	0.56	0.56	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	483	418	432					1455	651	210	1972	
v/s Ratio Prot								c0.38		0.04	c0.25	
v/s Ratio Perm	0.20	0.31	0.30						0.04	0.29		
v/c Ratio	0.68	1.08	1.05					0.93	0.10	0.60	0.44	
Uniform Delay, d1	25.3	28.5	28.5					22.5	14.4	28.2	10.4	
Progression Factor	1.00	1.00	1.00					0.90	0.83	0.57	0.56	
Incremental Delay, d2	3.2	66.8	58.0					11.9	0.3	2.9	0.7	
Delay (s)	28.4	95.3	86.5					32.0	12.3	18.9	6.5	
Level of Service	C	F	F					C	B	B	A	
Approach Delay (s)		76.5			0.0			30.0			8.1	
Approach LOS		E			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	256	191	287	210	122	81	217	140	81	274	79
Future Volume (vph)	148	256	191	287	210	122	81	217	140	81	274	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3178		1703	3406	1524
Flt Permitted	0.55	1.00	1.00	0.46	1.00	1.00	0.57	1.00		0.44	1.00	1.00
Satd. Flow (perm)	1003	1827	1553	858	1863	1583	1024	3178		791	3406	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	164	284	212	309	226	131	98	261	169	87	295	85
RTOR Reduction (vph)	0	0	153	0	0	89	0	113	0	0	0	62
Lane Group Flow (vph)	164	284	59	309	226	42	98	317	0	87	295	23
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	31.7	25.0	25.0	39.7	29.0	29.0	29.5	24.8		29.5	24.8	24.8
Effective Green, g (s)	31.7	25.0	25.0	39.7	29.0	29.0	29.5	24.8		29.5	24.8	24.8
Actuated g/C Ratio	0.35	0.28	0.28	0.44	0.32	0.32	0.33	0.28		0.33	0.28	0.28
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	407	507	431	486	600	510	371	875		306	938	419
v/s Ratio Prot	0.03	0.16		c0.08	0.12		0.01	c0.10		c0.01	0.09	
v/s Ratio Perm	0.11		0.04	c0.20		0.03	0.07			0.08		0.02
v/c Ratio	0.40	0.56	0.14	0.64	0.38	0.08	0.26	0.36		0.28	0.31	0.06
Uniform Delay, d1	24.2	27.8	24.4	24.7	23.5	21.2	22.5	26.2		24.8	25.9	24.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	4.4	0.7	2.7	1.8	0.3	0.4	1.2		0.5	0.9	0.3
Delay (s)	24.9	32.2	25.1	27.4	25.3	21.6	22.9	27.4		25.3	26.7	24.2
Level of Service	C	C	C	C	C	C	C	C		C	C	C
Approach Delay (s)		28.1			25.6			26.6			26.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	156	53	685	706	652	339
Future Volume (vph)	156	53	685	706	652	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3358	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3358	
Peak-hour factor, PHF	0.83	0.83	0.86	0.92	0.89	0.89
Adj. Flow (vph)	188	64	797	767	733	381
RTOR Reduction (vph)	0	55	0	222	74	0
Lane Group Flow (vph)	188	9	797	545	1040	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	10.9	10.9	56.8	56.8	56.8	
Effective Green, g (s)	10.9	10.9	56.8	56.8	56.8	
Actuated g/C Ratio	0.14	0.14	0.71	0.71	0.71	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	241	215	2512	1123	2384	
v/s Ratio Prot	c0.11	0.01	0.23		0.31	
v/s Ratio Perm				c0.34		
v/c Ratio	0.78	0.04	0.32	0.48	0.44	
Uniform Delay, d1	33.4	30.0	4.3	5.1	4.9	
Progression Factor	1.00	1.00	0.42	3.96	2.82	
Incremental Delay, d2	13.9	0.0	0.2	0.7	0.5	
Delay (s)	47.3	30.0	2.0	21.0	14.3	
Level of Service	D	C	A	C	B	
Approach Delay (s)			11.3		14.3	
Approach LOS			B		B	

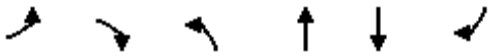
Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	259	225	60	43	205	326	33	379	29	161	309	80
Future Volume (vph)	259	225	60	43	205	326	33	379	29	161	309	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3502		1770	3430	
Flt Permitted	0.54	1.00	1.00	0.48	1.00	1.00	0.49	1.00		0.43	1.00	
Satd. Flow (perm)	997	1863	1583	898	1863	1583	909	3502		805	3430	
Peak-hour factor, PHF	0.84	0.84	0.84	0.87	0.87	0.87	0.72	0.72	0.72	0.85	0.85	0.85
Adj. Flow (vph)	308	268	71	49	236	375	46	526	40	189	364	94
RTOR Reduction (vph)	0	0	51	0	0	241	0	7	0	0	29	0
Lane Group Flow (vph)	308	268	20	49	236	134	46	559	0	189	429	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	274	512	435	246	512	435	522	2013		462	1972	
v/s Ratio Prot		0.14			0.13			0.16			0.13	
v/s Ratio Perm	c0.31		0.01	0.05		0.08	0.05			c0.23		
v/c Ratio	1.12	0.52	0.04	0.20	0.46	0.31	0.09	0.28		0.41	0.22	
Uniform Delay, d1	29.0	24.6	21.3	22.2	24.1	23.0	7.6	8.6		9.4	8.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.28	1.41	
Incremental Delay, d2	92.0	1.0	0.0	0.4	0.7	0.4	0.3	0.3		2.3	0.2	
Delay (s)	121.0	25.5	21.3	22.6	24.7	23.4	7.9	8.9		14.4	11.9	
Level of Service	F	C	C	C	C	C	A	A		B	B	
Approach Delay (s)		70.5			23.8			8.9			12.6	
Approach LOS		E			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	152	139	33	695	783	78
Future Volume (vph)	152	139	33	695	783	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3491	
Flt Permitted	0.95	1.00	0.26	1.00	1.00	
Satd. Flow (perm)	1770	1583	488	3539	3491	
Peak-hour factor, PHF	0.73	0.73	0.82	0.82	0.94	0.94
Adj. Flow (vph)	208	190	40	848	833	83
RTOR Reduction (vph)	0	156	0	0	8	0
Lane Group Flow (vph)	208	34	40	848	908	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	14.4	14.4	53.3	53.3	41.8	
Effective Green, g (s)	14.4	14.4	53.3	53.3	41.8	
Actuated g/C Ratio	0.18	0.18	0.67	0.67	0.52	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	318	284	408	2357	1824	
v/s Ratio Prot	c0.12		0.01	c0.24	c0.26	
v/s Ratio Perm		0.02	0.06			
v/c Ratio	0.65	0.12	0.10	0.36	0.50	
Uniform Delay, d1	30.5	27.5	7.9	5.9	12.3	
Progression Factor	1.00	1.00	0.25	0.26	0.71	
Incremental Delay, d2	4.8	0.2	0.1	0.4	0.9	
Delay (s)	35.3	27.7	2.1	1.9	9.7	
Level of Service	D	C	A	A	A	
Approach Delay (s)	31.6			1.9	9.7	
Approach LOS	C			A	A	

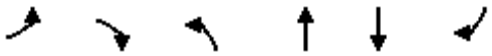
Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	163	40	689	158	21	698
Future Volume (vph)	163	40	689	158	21	698
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3440		1770	3539
Flt Permitted	0.95	1.00	1.00		0.22	1.00
Satd. Flow (perm)	1770	1583	3440		416	3539
Peak-hour factor, PHF	0.88	0.88	0.78	0.78	0.85	0.85
Adj. Flow (vph)	185	45	883	203	25	821
RTOR Reduction (vph)	0	37	18	0	0	0
Lane Group Flow (vph)	185	8	1069	0	25	821
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	13.6	13.6	40.0		54.5	54.5
Effective Green, g (s)	13.6	13.6	40.0		54.5	54.5
Actuated g/C Ratio	0.17	0.17	0.50		0.68	0.68
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	300	269	1720		344	2410
v/s Ratio Prot	c0.10		c0.31		0.00	c0.23
v/s Ratio Perm		0.00			0.05	
v/c Ratio	0.62	0.03	0.62		0.07	0.34
Uniform Delay, d1	30.8	27.7	14.5		7.3	5.3
Progression Factor	1.00	1.00	0.83		1.00	1.00
Incremental Delay, d2	3.7	0.0	1.6		0.1	0.4
Delay (s)	34.5	27.7	13.7		7.4	5.7
Level of Service	C	C	B		A	A
Approach Delay (s)	33.2		13.7			5.7
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

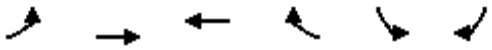
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	10	17	874	656	236
Future Volume (vph)	240	10	17	874	656	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3399	
Flt Permitted	0.95	1.00	0.13	1.00	1.00	
Satd. Flow (perm)	3433	1583	248	3539	3399	
Peak-hour factor, PHF	0.60	0.60	0.85	0.85	0.61	0.61
Adj. Flow (vph)	400	17	20	1028	1075	387
RTOR Reduction (vph)	0	14	0	0	36	0
Lane Group Flow (vph)	400	3	20	1028	1426	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	14.7	14.7	53.0	53.0	53.0	
Effective Green, g (s)	14.7	14.7	53.0	53.0	53.0	
Actuated g/C Ratio	0.18	0.18	0.66	0.66	0.66	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	630	290	164	2344	2251	
v/s Ratio Prot	c0.12			0.29	c0.42	
v/s Ratio Perm		0.00	0.08			
v/c Ratio	0.63	0.01	0.12	0.44	0.63	
Uniform Delay, d1	30.2	26.7	5.0	6.4	7.9	
Progression Factor	1.00	1.00	0.66	0.65	0.76	
Incremental Delay, d2	2.1	0.0	1.3	0.5	1.1	
Delay (s)	32.3	26.7	4.6	4.7	7.1	
Level of Service	C	C	A	A	A	
Approach Delay (s)	32.0			4.7	7.1	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	306	515	264	50	16	82
Future Volume (Veh/h)	306	515	264	50	16	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.67	0.67	0.60	0.60
Hourly flow rate (vph)	373	628	394	75	27	137
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	469				1769	395
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	469				1769	395
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	66				55	79
cM capacity (veh/h)	1093				60	654

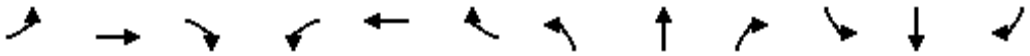
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	373	628	394	75	27	137
Volume Left	373	0	0	0	27	0
Volume Right	0	0	0	75	0	137
cSH	1093	1700	1700	1700	60	654
Volume to Capacity	0.34	0.37	0.23	0.04	0.45	0.21
Queue Length 95th (ft)	38	0	0	0	43	20
Control Delay (s)	10.0	0.0	0.0	0.0	106.0	12.0
Lane LOS	A				F	B
Approach Delay (s)	3.7		0.0		27.4	
Approach LOS					D	

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	44.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	524	7	3	312	2	25
Future Volume (Veh/h)	524	7	3	312	2	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	557	7	3	332	3	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			564		898	560
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			564		898	560
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	93
cM capacity (veh/h)			1008		309	527

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	564	335	40
Volume Left	0	3	3
Volume Right	7	0	37
cSH	1700	1008	501
Volume to Capacity	0.33	0.00	0.08
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.1	12.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.8
Approach LOS			B

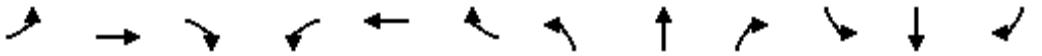
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	0	36	1	1	0	102	839	2	7	557	102
Future Volume (Veh/h)	52	0	36	1	1	0	102	839	2	7	557	102
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.90	0.90	0.90	0.72	0.72	0.72
Hourly flow rate (vph)	87	0	60	2	2	0	113	932	2	10	774	142
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.91	0.91	0.91	0.91	0.91		0.91					
vC, conflicting volume	1558	2025	458	1566	2095	467	916			934		
vC1, stage 1 conf vol	865	865		1159	1159							
vC2, stage 2 conf vol	693	1160		407	936							
vCu, unblocked vol	1419	1931	213	1428	2008	467	715			934		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	66	100	92	99	99	100	86			99		
cM capacity (veh/h)	254	194	723	171	175	542	804			729		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	147	4	113	621	313	10	516	400
Volume Left	87	2	113	0	0	10	0	0
Volume Right	60	0	0	0	2	0	0	142
cSH	429	173	804	1700	1700	729	1700	1700
Volume to Capacity	0.34	0.02	0.14	0.37	0.18	0.01	0.30	0.24
Queue Length 95th (ft)	38	2	12	0	0	1	0	0
Control Delay (s)	19.9	26.3	10.2	0.0	0.0	10.0	0.0	0.0
Lane LOS	C	D	B			B		
Approach Delay (s)	19.9	26.3	1.1			0.1		
Approach LOS	C	D						

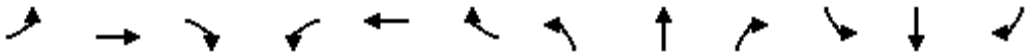
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	41.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	25	60	48	484	62	60	117	3	1	184	2
Future Volume (vph)	7	25	60	48	484	62	60	117	3	1	184	2
Peak Hour Factor	0.75	0.75	0.75	0.67	0.67	0.67	0.85	0.85	0.85	0.60	0.60	0.60
Hourly flow rate (vph)	9	33	80	72	722	93	71	138	4	2	307	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	122	887	213	309	3
Volume Left (vph)	9	72	71	2	0
Volume Right (vph)	80	93	4	0	3
Hadj (s)	-0.34	-0.01	0.09	0.04	-0.67
Departure Headway (s)	6.8	6.1	7.2	7.3	6.6
Degree Utilization, x	0.23	1.00	0.42	0.62	0.01
Capacity (veh/h)	484	887	475	484	531
Control Delay (s)	11.8	61.3	15.3	20.4	8.4
Approach Delay (s)	11.8	61.3	15.3	20.3	
Approach LOS	B	F	C	C	

Intersection Summary				
Delay	42.6			
Level of Service	E			
Intersection Capacity Utilization	68.4%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	2	27	2	137	13	1061	40	106	863	579
Future Volume (Veh/h)	27	0	2	27	2	137	13	1061	40	106	863	579
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.88	0.88	0.95	0.74	0.74	0.74	0.66	0.66	0.66
Hourly flow rate (vph)	45	0	3	31	2	144	18	1434	54	161	1308	877
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.93	0.93	0.86	0.93	0.93	0.86	0.86			0.86		
vC, conflicting volume	2968	3594	1094	2476	4005	744	2186			1488		
vC1, stage 1 conf vol	2070	2070		1497	1497							
vC2, stage 2 conf vol	898	1524		979	2508							
vCu, unblocked vol	2288	2961	782	1759	3404	377	2053			1242		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	99	75	88	73	92			66		
cM capacity (veh/h)	37	23	289	122	17	534	232			479		

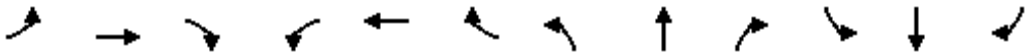
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	45	3	33	144	18	956	532	161	872	1313
Volume Left	45	0	31	0	18	0	0	161	0	0
Volume Right	0	3	0	144	0	0	54	0	0	877
cSH	37	289	89	534	232	1700	1700	479	1700	1700
Volume to Capacity	1.22	0.01	0.37	0.27	0.08	0.56	0.31	0.34	0.51	0.77
Queue Length 95th (ft)	116	1	37	27	6	0	0	37	0	0
Control Delay (s)	388.3	17.6	68.0	14.2	21.8	0.0	0.0	16.3	0.0	0.0
Lane LOS	F	C	F	B	C			C		
Approach Delay (s)	365.1		24.3		0.3			1.1		
Approach LOS	F		C							

Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	64.1%	ICU Level of Service		C
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	52	13	27	49	14
Future Volume (Veh/h)	29	52	13	27	49	14
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	45	80	20	42	67	19
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	195	42			63	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	195	42			63	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	92			96	
cM capacity (veh/h)	758	1028			1538	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	125	62	86
Volume Left	45	0	67
Volume Right	80	42	0
cSH	911	1700	1538
Volume to Capacity	0.14	0.04	0.04
Queue Length 95th (ft)	12	0	3
Control Delay (s)	9.6	0.0	5.9
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	5.9
Approach LOS	A		

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	788	0	1	353	3	3	11	8	6	1	27
Future Volume (Veh/h)	17	788	0	1	353	3	3	11	8	6	1	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	21	961	0	1	436	4	4	16	12	7	1	29
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	443			962			1474	1449	962	1466	1447	442
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	443			962			1474	1449	962	1466	1447	442
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	87	96	92	99	95
cM capacity (veh/h)	1114			715			97	128	310	90	128	613

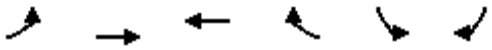
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	982	441	32	37
Volume Left	21	1	4	7
Volume Right	0	4	12	29
cSH	1114	715	156	279
Volume to Capacity	0.02	0.00	0.21	0.13
Queue Length 95th (ft)	1	0	18	11
Control Delay (s)	0.5	0.0	33.9	19.9
Lane LOS	A	A	D	C
Approach Delay (s)	0.5	0.0	33.9	19.9
Approach LOS			D	C

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	182	39	24	70	16	49
Future Volume (Veh/h)	182	39	24	70	16	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.83	0.83	0.60	0.60
Hourly flow rate (vph)	212	45	29	84	27	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			257		376	234
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			257		376	234
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	90
cM capacity (veh/h)			1308		611	805

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	257	113	109
Volume Left	0	29	27
Volume Right	45	0	82
cSH	1700	1308	746
Volume to Capacity	0.15	0.02	0.15
Queue Length 95th (ft)	0	2	13
Control Delay (s)	0.0	2.1	10.6
Lane LOS		A	B
Approach Delay (s)	0.0	2.1	10.6
Approach LOS			B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	93	138	60	48	70	34
Future Volume (Veh/h)	93	138	60	48	70	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.79	0.79	0.73	0.73	0.69	0.69
Hourly flow rate (vph)	118	175	82	66	101	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	148				526	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148				526	115
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				79	95
cM capacity (veh/h)	1434				470	937

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	293	148	150
Volume Left	118	0	101
Volume Right	0	66	49
cSH	1434	1700	562
Volume to Capacity	0.08	0.09	0.27
Queue Length 95th (ft)	7	0	27
Control Delay (s)	3.5	0.0	13.7
Lane LOS	A		B
Approach Delay (s)	3.5	0.0	13.7
Approach LOS			B

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	185	0	275	477
Future Volume (Veh/h)	0	0	185	0	275	477
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	201	0	299	518
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1317	201			201	
vC1, stage 1 conf vol	201					
vC2, stage 2 conf vol	1116					
vCu, unblocked vol	1317	201			201	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			78	
cM capacity (veh/h)	237	840			1371	

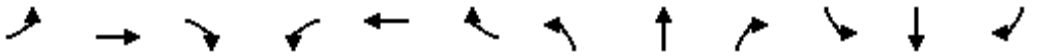
Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	201	299	518
Volume Left	0	299	0
Volume Right	0	0	0
cSH	1700	1371	1700
Volume to Capacity	0.12	0.22	0.30
Queue Length 95th (ft)	0	21	0
Control Delay (s)	0.0	8.4	0.0
Lane LOS		A	
Approach Delay (s)	0.0	3.1	
Approach LOS			

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		32.1%	ICU Level of Service
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	362	0	687	0	0	0	0	1536	121	53	583	0
Future Volume (vph)	362	0	687	0	0	0	0	1536	121	53	583	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	0.99					1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1442	1484					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1681	1442	1484					3539	1583	171	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	385	0	731	0	0	0	0	1807	142	60	655	0
RTOR Reduction (vph)	0	181	181	0	0	0	0	0	68	0	0	0
Lane Group Flow (vph)	346	209	199	0	0	0	0	1807	74	60	655	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	18.7	18.7	18.7					37.2	37.2	48.9	48.9	
Effective Green, g (s)	18.7	18.7	18.7					37.2	37.2	48.9	48.9	
Actuated g/C Ratio	0.23	0.23	0.23					0.47	0.47	0.61	0.61	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	392	337	346					1645	736	210	2163	
v/s Ratio Prot								c0.51		0.02	c0.19	
v/s Ratio Perm	c0.21	0.15	0.13						0.05	0.16		
v/c Ratio	0.88	0.62	0.58					1.10	0.10	0.29	0.30	
Uniform Delay, d1	29.6	27.5	27.1					21.4	12.0	30.7	7.4	
Progression Factor	1.00	1.00	1.00					0.80	0.59	0.52	0.43	
Incremental Delay, d2	19.7	2.5	1.4					52.7	0.2	0.3	0.3	
Delay (s)	49.3	30.0	28.6					69.8	7.3	16.4	3.5	
Level of Service	D	C	C					E	A	B	A	
Approach Delay (s)		35.5			0.0			65.3			4.6	
Approach LOS		D			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	318	159	165	298	153	309	418	256	212	182	210
Future Volume (vph)	78	318	159	165	298	153	309	418	256	212	182	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3212		1703	3406	1524
Flt Permitted	0.40	1.00	1.00	0.36	1.00	1.00	0.63	1.00		0.20	1.00	1.00
Satd. Flow (perm)	731	1827	1553	673	1863	1583	1131	3212		367	3406	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	346	173	176	317	163	325	440	269	223	192	221
RTOR Reduction (vph)	0	0	125	0	0	114	0	103	0	0	0	163
Lane Group Flow (vph)	85	346	48	176	317	49	325	606	0	223	192	58
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	30.2	25.0	25.0	34.8	27.3	27.3	32.7	23.6		32.7	23.6	23.6
Effective Green, g (s)	30.2	25.0	25.0	34.8	27.3	27.3	32.7	23.6		32.7	23.6	23.6
Actuated g/C Ratio	0.34	0.28	0.28	0.39	0.30	0.30	0.36	0.26		0.36	0.26	0.26
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	303	507	431	351	565	480	468	842		268	893	399
v/s Ratio Prot	0.02	c0.19		c0.04	0.17		0.07	0.19		c0.08	0.06	
v/s Ratio Perm	0.08		0.03	0.15		0.03	0.18			c0.22		0.04
v/c Ratio	0.28	0.68	0.11	0.50	0.56	0.10	0.69	0.72		0.83	0.22	0.15
Uniform Delay, d1	27.3	29.0	24.2	28.0	26.3	22.5	25.6	30.2		32.2	26.0	25.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	7.3	0.5	1.1	4.0	0.4	4.4	5.3		19.3	0.6	0.8
Delay (s)	27.8	36.2	24.7	29.1	30.3	23.0	30.0	35.4		51.5	26.5	26.2
Level of Service	C	D	C	C	C	C	C	D		D	C	C
Approach Delay (s)		31.8			28.2			33.7			35.2	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	93	148	939	959	543	411
Future Volume (vph)	93	148	939	959	543	411
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.94	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3310	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3310	
Peak-hour factor, PHF	0.78	0.78	0.89	0.92	0.90	0.90
Adj. Flow (vph)	119	190	1055	1042	603	457
RTOR Reduction (vph)	0	149	0	264	116	0
Lane Group Flow (vph)	119	42	1055	778	944	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	8.0	8.0	59.7	59.7	59.7	
Effective Green, g (s)	8.0	8.0	59.7	59.7	59.7	
Actuated g/C Ratio	0.10	0.10	0.75	0.75	0.75	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	177	158	2640	1181	2470	
v/s Ratio Prot	c0.07	0.03	0.30		0.29	
v/s Ratio Perm				c0.49		
v/c Ratio	0.67	0.26	0.40	0.66	0.38	
Uniform Delay, d1	34.7	33.3	3.7	5.1	3.6	
Progression Factor	1.00	1.00	0.07	15.01	4.64	
Incremental Delay, d2	7.7	0.3	0.0	0.3	0.4	
Delay (s)	42.4	33.6	0.3	76.3	17.1	
Level of Service	D	C	A	E	B	
Approach Delay (s)			38.0		17.1	
Approach LOS			D		B	

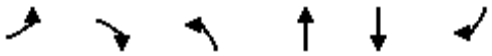
Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	291	58	64	346	256	80	371	67	333	398	197
Future Volume (vph)	193	291	58	64	346	256	80	371	67	333	398	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3458		1770	3363	
Flt Permitted	0.19	1.00	1.00	0.42	1.00	1.00	0.39	1.00		0.42	1.00	
Satd. Flow (perm)	355	1863	1583	783	1863	1583	731	3458		787	3363	
Peak-hour factor, PHF	0.95	0.95	0.95	0.76	0.76	0.76	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	203	306	61	84	455	337	107	495	89	358	428	212
RTOR Reduction (vph)	0	0	44	0	0	244	0	18	0	0	52	0
Lane Group Flow (vph)	203	306	17	84	455	93	107	566	0	358	588	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)	22.0	22.0	22.0	22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	97	512	435	215	512	435	420	1988		452	1933	
v/s Ratio Prot		0.16			0.24			0.16			0.17	
v/s Ratio Perm	c0.57		0.01	0.11		0.06	0.15			c0.45		
v/c Ratio	2.09	0.60	0.04	0.39	0.89	0.21	0.25	0.28		0.79	0.30	
Uniform Delay, d1	29.0	25.2	21.3	23.6	27.8	22.3	8.5	8.6		13.3	8.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.30	1.43	
Incremental Delay, d2	525.0	1.9	0.0	1.2	16.9	0.2	1.5	0.4		12.2	0.4	
Delay (s)	554.0	27.0	21.3	24.7	44.8	22.6	9.9	9.0		29.5	12.9	
Level of Service	F	C	C	C	D	C	A	A		C	B	
Approach Delay (s)		214.1			34.3			9.1			18.9	
Approach LOS		F			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	56.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	152	79	163	1045	908	211
Future Volume (vph)	152	79	163	1045	908	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1561	1770	3539	3439	
Flt Permitted	0.95	1.00	0.16	1.00	1.00	
Satd. Flow (perm)	1770	1561	298	3539	3439	
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.94	0.94
Adj. Flow (vph)	165	86	179	1148	966	224
RTOR Reduction (vph)	0	72	0	0	22	0
Lane Group Flow (vph)	165	14	179	1148	1169	0
Confl. Peds. (#/hr)		1				
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.7	12.7	55.0	55.0	40.0	
Effective Green, g (s)	12.7	12.7	55.0	55.0	40.0	
Actuated g/C Ratio	0.16	0.16	0.69	0.69	0.50	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	280	247	364	2433	1719	
v/s Ratio Prot	c0.09		0.05	c0.32	c0.34	
v/s Ratio Perm		0.01	0.28			
v/c Ratio	0.59	0.06	0.49	0.47	0.68	
Uniform Delay, d1	31.2	28.6	16.9	5.8	15.1	
Progression Factor	1.00	1.00	0.55	0.44	0.70	
Incremental Delay, d2	3.2	0.1	1.0	0.6	2.0	
Delay (s)	34.4	28.7	10.2	3.2	12.7	
Level of Service	C	C	B	A	B	
Approach Delay (s)	32.4			4.1	12.7	
Approach LOS	C			A	B	

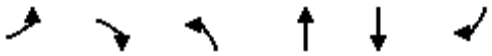
Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	46	1068	129	42	986
Future Volume (vph)	133	46	1068	129	42	986
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3482		1770	3539
Flt Permitted	0.95	1.00	1.00		0.16	1.00
Satd. Flow (perm)	1770	1583	3482		289	3539
Peak-hour factor, PHF	0.80	0.80	0.93	0.93	0.89	0.89
Adj. Flow (vph)	166	58	1148	139	47	1108
RTOR Reduction (vph)	0	49	9	0	0	0
Lane Group Flow (vph)	166	9	1278	0	47	1108
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.8	12.8	38.9		55.3	55.3
Effective Green, g (s)	12.8	12.8	38.9		55.3	55.3
Actuated g/C Ratio	0.16	0.16	0.49		0.69	0.69
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	283	253	1693		301	2446
v/s Ratio Prot	c0.09		c0.37		0.01	c0.31
v/s Ratio Perm		0.01			0.10	
v/c Ratio	0.59	0.04	0.76		0.16	0.45
Uniform Delay, d1	31.1	28.4	16.7		10.5	5.6
Progression Factor	1.00	1.00	0.92		1.00	1.00
Incremental Delay, d2	3.1	0.1	2.9		0.2	0.6
Delay (s)	34.2	28.5	18.2		10.8	6.2
Level of Service	C	C	B		B	A
Approach Delay (s)	32.7		18.2			6.3
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	643	33	8	902	871	212
Future Volume (vph)	643	33	8	902	871	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3435	
Flt Permitted	0.95	1.00	0.19	1.00	1.00	
Satd. Flow (perm)	3433	1583	352	3539	3435	
Peak-hour factor, PHF	0.83	0.83	0.77	0.77	0.94	0.94
Adj. Flow (vph)	775	40	10	1171	927	226
RTOR Reduction (vph)	0	29	0	0	26	0
Lane Group Flow (vph)	775	11	10	1171	1127	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	21.2	21.2	46.5	46.5	46.5	
Effective Green, g (s)	21.2	21.2	46.5	46.5	46.5	
Actuated g/C Ratio	0.26	0.26	0.58	0.58	0.58	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	909	419	204	2057	1996	
v/s Ratio Prot	c0.23			c0.33	0.33	
v/s Ratio Perm		0.01	0.03			
v/c Ratio	0.85	0.03	0.05	0.57	0.56	
Uniform Delay, d1	27.9	21.8	7.2	10.5	10.4	
Progression Factor	1.00	1.00	0.81	0.80	0.61	
Incremental Delay, d2	7.8	0.0	0.4	1.0	1.1	
Delay (s)	35.7	21.8	6.3	9.4	7.5	
Level of Service	D	C	A	A	A	
Approach Delay (s)	35.0			9.4	7.5	
Approach LOS	D			A	A	

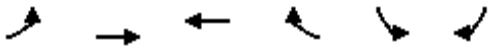
Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	377	0	298
Future Volume (Veh/h)	0	0	0	377	0	298
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	410	0	324
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	410	0	324			
vC1, stage 1 conf vol	0					
vC2, stage 2 conf vol	410					
vCu, unblocked vol	410	0	324			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	652	1085	1236			

Direction, Lane #	NE 1	SW 1
Volume Total	410	324
Volume Left	0	0
Volume Right	0	324
cSH	1700	1700
Volume to Capacity	0.24	0.19
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.0
Lane LOS		
Approach Delay (s)	0.0	0.0
Approach LOS		

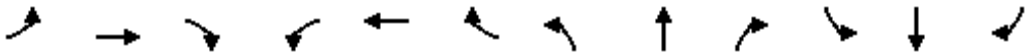
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	23.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	118	476	587	24	41	232
Future Volume (Veh/h)	118	476	587	24	41	232
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	126	506	618	25	46	261
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	643				1377	619
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	643				1377	619
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				67	47
cM capacity (veh/h)	942				138	488

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	126	506	618	25	46	261
Volume Left	126	0	0	0	46	0
Volume Right	0	0	0	25	0	261
cSH	942	1700	1700	1700	138	488
Volume to Capacity	0.13	0.30	0.36	0.01	0.33	0.53
Queue Length 95th (ft)	12	0	0	0	34	78
Control Delay (s)	9.4	0.0	0.0	0.0	43.5	20.5
Lane LOS	A				E	C
Approach Delay (s)	1.9		0.0		24.0	
Approach LOS					C	

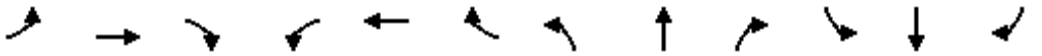
Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	0	67	5	0	8	91	815	4	3	822	79
Future Volume (Veh/h)	87	0	67	5	0	8	91	815	4	3	822	79
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.65	0.65	0.60	0.60	0.60	0.87	0.87	0.87	0.95	0.95	0.95
Hourly flow rate (vph)	134	0	103	8	0	13	105	937	5	3	865	83
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1605	2064	474	1588	2104	472	948			942		
vC1, stage 1 conf vol	912	912		1150	1150							
vC2, stage 2 conf vol	692	1152		438	954							
vCu, unblocked vol	1333	1882	0	1313	1929	472	548			942		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	51	100	89	95	100	98	88			100		
cM capacity (veh/h)	271	206	907	178	191	538	852			724		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	237	21	105	625	317	3	577	371
Volume Left	134	8	105	0	0	3	0	0
Volume Right	103	13	0	0	5	0	0	83
cSH	480	303	852	1700	1700	724	1700	1700
Volume to Capacity	0.49	0.07	0.12	0.37	0.19	0.00	0.34	0.22
Queue Length 95th (ft)	67	6	11	0	0	0	0	0
Control Delay (s)	21.4	17.7	9.8	0.0	0.0	10.0	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	21.4	17.7	1.0			0.0		
Approach LOS	C	C						

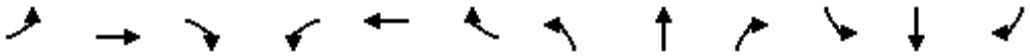
Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	51.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	92	253	62	139	22	17	6	29	20	66	4
Future Volume (vph)	2	92	253	62	139	22	17	6	29	20	66	4
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.93	0.93	0.93	0.86	0.86	0.86
Hourly flow rate (vph)	3	153	422	98	221	35	18	6	31	23	77	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	578	354	55	100	5
Volume Left (vph)	3	98	18	23	0
Volume Right (vph)	422	35	31	0	5
Hadj (s)	-0.40	0.03	-0.24	0.15	-0.67
Departure Headway (s)	4.5	5.2	6.3	6.9	6.1
Degree Utilization, x	0.73	0.51	0.10	0.19	0.01
Capacity (veh/h)	578	663	495	464	520
Control Delay (s)	18.6	13.4	9.9	10.4	8.0
Approach Delay (s)	18.6	13.4	9.9	10.3	
Approach LOS	C	B	A	B	

Intersection Summary				
Delay	15.7			
Level of Service	C			
Intersection Capacity Utilization	52.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	5	45	40	1	80	13	1486	46	63	998	209
Future Volume (Veh/h)	91	5	45	40	1	80	13	1486	46	63	998	209
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.69	0.69	0.69	0.85	0.85	0.85	0.86	0.86	0.86
Hourly flow rate (vph)	125	7	62	58	1	116	15	1748	54	73	1160	243
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.84	0.84	0.92	0.84	0.84	0.80	0.92			0.80		
vC, conflicting volume	2449	3260	702	2596	3355	901	1404			1802		
vC1, stage 1 conf vol	1428	1428		1805	1805							
vC2, stage 2 conf vol	1020	1832		792	1550							
vCu, unblocked vol	1894	2863	494	2070	2976	361	1259			1494		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	88	87	36	99	77	97			79		
cM capacity (veh/h)	109	58	477	91	92	506	502			354		

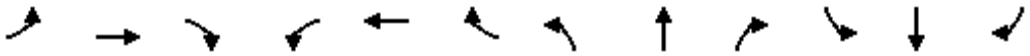
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	125	69	59	116	15	1165	637	73	773	630
Volume Left	125	0	58	0	15	0	0	73	0	0
Volume Right	0	62	0	116	0	0	54	0	0	243
cSH	109	276	91	506	502	1700	1700	354	1700	1700
Volume to Capacity	1.15	0.25	0.65	0.23	0.03	0.69	0.37	0.21	0.45	0.37
Queue Length 95th (ft)	198	24	78	22	2	0	0	19	0	0
Control Delay (s)	206.4	22.4	99.8	14.2	12.4	0.0	0.0	17.8	0.0	0.0
Lane LOS	F	C	F	B	B			C		
Approach Delay (s)	140.9		43.1		0.1			0.9		
Approach LOS	F		E							

Intersection Summary					
Average Delay	9.9				
Intersection Capacity Utilization	67.7%	ICU Level of Service		C	
Analysis Period (min)	15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	69	37	10	56	37
Future Volume (Veh/h)	64	69	37	10	56	37
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	107	115	47	13	77	51
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	260	54			60	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	54			60	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	89			95	
cM capacity (veh/h)	692	1014			1544	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	222	60	128
Volume Left	107	0	77
Volume Right	115	13	0
cSH	828	1700	1544
Volume to Capacity	0.27	0.04	0.05
Queue Length 95th (ft)	27	0	4
Control Delay (s)	10.9	0.0	4.6
Lane LOS	B		A
Approach Delay (s)	10.9	0.0	4.6
Approach LOS	B		

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	589	4	13	802	7	1	6	8	20	20	58
Future Volume (Veh/h)	28	589	4	13	802	7	1	6	8	20	20	58
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	29	620	4	16	1003	9	1	7	10	33	33	97
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1013			624			1833	1725	622	1734	1722	1008
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1013			624			1833	1725	622	1734	1722	1008
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			96	92	98	45	61	67
cM capacity (veh/h)	684			957			26	84	487	60	84	291

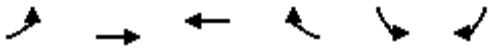
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	653	1028	18	163
Volume Left	29	16	1	33
Volume Right	4	9	10	97
cSH	684	957	126	128
Volume to Capacity	0.04	0.02	0.14	1.27
Queue Length 95th (ft)	3	1	12	258
Control Delay (s)	1.1	0.5	38.3	236.2
Lane LOS	A	A	E	F
Approach Delay (s)	1.1	0.5	38.3	236.2
Approach LOS			E	F

Intersection Summary				
Average Delay	21.7			
Intersection Capacity Utilization	65.4%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	187	31	62	290	41	65
Future Volume (Veh/h)	187	31	62	290	41	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	225	37	70	330	48	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			262		714	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			262		714	244
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		87	90
cM capacity (veh/h)			1302		377	795

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	262	400	124
Volume Left	0	70	48
Volume Right	37	0	76
cSH	1700	1302	556
Volume to Capacity	0.15	0.05	0.22
Queue Length 95th (ft)	0	4	21
Control Delay (s)	0.0	1.8	13.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.8	13.3
Approach LOS			B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	115	137	212	112	95	140
Future Volume (Veh/h)	115	137	212	112	95	140
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.82	0.82	0.88	0.88
Hourly flow rate (vph)	129	154	259	137	108	159
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	396				740	328
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396				740	328
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				68	78
cM capacity (veh/h)	1163				342	714

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	283	396	267
Volume Left	129	0	108
Volume Right	0	137	159
cSH	1163	1700	496
Volume to Capacity	0.11	0.23	0.54
Queue Length 95th (ft)	9	0	79
Control Delay (s)	4.4	0.0	20.4
Lane LOS	A		C
Approach Delay (s)	4.4	0.0	20.4
Approach LOS			C

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	377	0	208	298
Future Volume (Veh/h)	0	0	377	0	208	298
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	410	0	226	324
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1186	410			410	
vC1, stage 1 conf vol	410					
vC2, stage 2 conf vol	776					
vCu, unblocked vol	1186	410			410	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			80	
cM capacity (veh/h)	337	642			1149	

Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	410	226	324
Volume Left	0	226	0
Volume Right	0	0	0
cSH	1700	1149	1700
Volume to Capacity	0.24	0.20	0.19
Queue Length 95th (ft)	0	18	0
Control Delay (s)	0.0	8.9	0.0
Lane LOS		A	
Approach Delay (s)	0.0	3.7	
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

APPENDIX I

2040 BUILD CAPACITY REPORTS

Appendix I contains the Synchro capacity analyses worksheets for the alternatives for the year 2040 build conditions. The Dort Highway Corridor Extension includes an intersection each at the North and South I-75 ramps, and intersections at Cook Road, Pollock Road, and Baldwin Road. To cover the alternative conditions, the appendix is divided into the following five sections.

I-1 All Project Area intersections except the Dort Highway Extension intersections

I-2 Dort Highway Extension Alternative A and B intersections with Roundabouts at I-75 Ramps

I-3 Dort Highway Extension Alternative A and B intersections with Stop Signs

I-4 Dort Highway Extension Alternative C intersections on McWain Road with Roundabouts at I-75 Ramps

I-5 Dort Highway Extension Alternative C intersections on McWain Road with Stop Signs

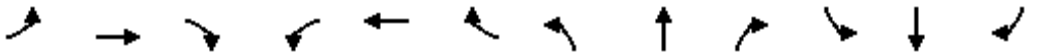
APPENDIX I-1

ALL PROJECT AREA INTERSECTIONS
EXCEPT THE DORT HIGHWAY EXTENSION INTERSECTIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	1	439	0	0	0	0	976	90	120	604	0
Future Volume (vph)	319	1	439	0	0	0	0	976	90	120	604	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1481	1504					3539	1583	1770	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.14	1.00	
Satd. Flow (perm)	1681	1481	1504					3539	1583	259	3539	
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	404	1	556	0	0	0	0	1205	111	148	746	0
RTOR Reduction (vph)	0	146	146	0	0	0	0	0	60	0	0	0
Lane Group Flow (vph)	335	169	165	0	0	0	0	1205	51	148	746	0
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	18.2	18.2	18.2					36.4	36.4	49.4	49.4	
Effective Green, g (s)	18.2	18.2	18.2					36.4	36.4	49.4	49.4	
Actuated g/C Ratio	0.23	0.23	0.23					0.45	0.45	0.62	0.62	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	382	336	342					1610	720	284	2185	
v/s Ratio Prot								c0.34		c0.04	0.21	
v/s Ratio Perm	c0.20	0.11	0.11						0.03	0.28		
v/c Ratio	0.88	0.50	0.48					0.75	0.07	0.52	0.34	
Uniform Delay, d1	29.8	27.0	26.8					18.0	12.3	21.8	7.4	
Progression Factor	1.00	1.00	1.00					0.94	1.06	0.91	0.83	
Incremental Delay, d2	19.1	0.4	0.4					3.1	0.2	0.8	0.4	
Delay (s)	48.9	27.4	27.2					20.1	13.2	20.6	6.6	
Level of Service	D	C	C					C	B	C	A	
Approach Delay (s)		34.8			0.0			19.5			8.9	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	256	201	399	210	122	94	241	292	94	396	92
Future Volume (vph)	148	256	201	399	210	122	94	241	292	94	396	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3089		1703	3406	1524
Flt Permitted	0.55	1.00	1.00	0.46	1.00	1.00	0.44	1.00		0.26	1.00	1.00
Satd. Flow (perm)	1003	1827	1553	858	1863	1583	790	3089		462	3406	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	164	284	223	429	226	131	113	290	352	101	426	99
RTOR Reduction (vph)	0	0	161	0	0	89	0	234	0	0	0	73
Lane Group Flow (vph)	164	284	62	429	226	42	113	408	0	101	426	26
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	32.2	25.0	25.0	40.2	29.0	29.0	29.0	24.0		29.0	24.0	24.0
Effective Green, g (s)	32.2	25.0	25.0	40.2	29.0	29.0	29.0	24.0		29.0	24.0	24.0
Actuated g/C Ratio	0.36	0.28	0.28	0.45	0.32	0.32	0.32	0.27		0.32	0.27	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	417	507	431	496	600	510	305	823		217	908	406
v/s Ratio Prot	0.03	0.16		c0.11	0.12		0.02	c0.13		c0.03	0.13	
v/s Ratio Perm	0.11		0.04	c0.28		0.03	0.10			0.12		0.02
v/c Ratio	0.39	0.56	0.14	0.86	0.38	0.08	0.37	0.50		0.47	0.47	0.07
Uniform Delay, d1	23.8	27.8	24.4	25.4	23.5	21.2	26.0	27.9		31.5	27.7	24.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	4.4	0.7	14.5	1.8	0.3	0.8	2.1		1.6	1.7	0.3
Delay (s)	24.5	32.2	25.1	39.9	25.3	21.6	26.8	30.0		33.0	29.4	24.9
Level of Service	C	C	C	D	C	C	C	C		C	C	C
Approach Delay (s)		28.0			32.7			29.5			29.3	
Approach LOS		C			C			C			C	

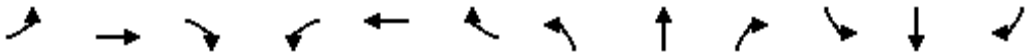
Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	99	59	742	553	625	393
Future Volume (vph)	99	59	742	553	625	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.94	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3334	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3334	
Peak-hour factor, PHF	0.83	0.83	0.86	0.92	0.89	0.89
Adj. Flow (vph)	119	71	863	601	702	442
RTOR Reduction (vph)	0	64	0	148	93	0
Lane Group Flow (vph)	119	7	863	453	1051	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	7.4	7.4	60.3	60.3	60.3	
Effective Green, g (s)	7.4	7.4	60.3	60.3	60.3	
Actuated g/C Ratio	0.09	0.09	0.75	0.75	0.75	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	163	146	2667	1193	2513	
v/s Ratio Prot	c0.07	0.00	0.24		c0.32	
v/s Ratio Perm				0.29		
v/c Ratio	0.73	0.04	0.32	0.38	0.42	
Uniform Delay, d1	35.3	33.1	3.2	3.4	3.5	
Progression Factor	1.00	1.00	0.37	0.54	1.74	
Incremental Delay, d2	13.4	0.0	0.2	0.6	0.5	
Delay (s)	48.8	33.1	1.4	2.4	6.6	
Level of Service	D	C	A	A	A	
Approach Delay (s)			1.8		6.6	
Approach LOS			A		A	

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

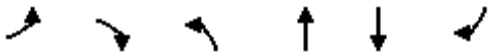
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	312	144	52	249	390	53	433	34	151	284	75
Future Volume (vph)	146	312	144	52	249	390	53	433	34	151	284	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3372		1770	1863	1583	1770	3501		1770	3429	
Flt Permitted	0.42	1.00		0.32	1.00	1.00	0.51	1.00		0.39	1.00	
Satd. Flow (perm)	783	3372		604	1863	1583	942	3501		735	3429	
Peak-hour factor, PHF	0.84	0.84	0.84	0.87	0.87	0.87	0.72	0.72	0.72	0.85	0.85	0.85
Adj. Flow (vph)	174	371	171	60	286	448	74	601	47	178	334	88
RTOR Reduction (vph)	0	70	0	0	0	212	0	7	0	0	27	0
Lane Group Flow (vph)	174	472	0	60	286	236	74	641	0	178	395	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	19.4	19.4		19.4	19.4	19.4	48.6	48.6		48.6	48.6	
Effective Green, g (s)	19.4	19.4		19.4	19.4	19.4	48.6	48.6		48.6	48.6	
Actuated g/C Ratio	0.24	0.24		0.24	0.24	0.24	0.61	0.61		0.61	0.61	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	189	817		146	451	383	572	2126		446	2083	
v/s Ratio Prot		0.14			0.15			0.18			0.12	
v/s Ratio Perm	c0.22			0.10		0.15	0.08			c0.24		
v/c Ratio	0.92	0.58		0.41	0.63	0.62	0.13	0.30		0.40	0.19	
Uniform Delay, d1	29.5	26.7		25.5	27.1	27.0	6.7	7.5		8.1	7.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.26	1.39	
Incremental Delay, d2	43.5	1.0		1.9	2.9	2.9	0.5	0.4		2.5	0.2	
Delay (s)	73.0	27.7		27.4	30.0	29.9	7.2	7.9		12.7	9.8	
Level of Service	E	C		C	C	C	A	A		B	A	
Approach Delay (s)		38.7			29.8			7.8			10.7	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	52	138	39	804	800	89
Future Volume (vph)	52	138	39	804	800	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3486	
Flt Permitted	0.95	1.00	0.27	1.00	1.00	
Satd. Flow (perm)	1770	1583	498	3539	3486	
Peak-hour factor, PHF	0.73	0.73	0.82	0.82	0.94	0.94
Adj. Flow (vph)	71	189	48	980	851	95
RTOR Reduction (vph)	0	168	0	0	7	0
Lane Group Flow (vph)	71	21	48	980	939	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	8.9	8.9	58.8	58.8	47.3	
Effective Green, g (s)	8.9	8.9	58.8	58.8	47.3	
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.59	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	196	176	448	2601	2061	
v/s Ratio Prot	c0.04		0.01	c0.28	c0.27	
v/s Ratio Perm		0.01	0.07			
v/c Ratio	0.36	0.12	0.11	0.38	0.46	
Uniform Delay, d1	32.9	32.0	5.1	3.9	9.1	
Progression Factor	1.00	1.00	0.26	0.24	0.71	
Incremental Delay, d2	1.1	0.3	0.1	0.4	0.7	
Delay (s)	34.1	32.3	1.4	1.4	7.2	
Level of Service	C	C	A	A	A	
Approach Delay (s)	32.8			1.4	7.2	
Approach LOS	C			A	A	

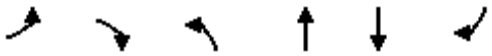
Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	163	40	681	175	24	726
Future Volume (vph)	163	40	681	175	24	726
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3431		1770	3539
Flt Permitted	0.95	1.00	1.00		0.22	1.00
Satd. Flow (perm)	1770	1583	3431		409	3539
Peak-hour factor, PHF	0.88	0.88	0.78	0.78	0.85	0.85
Adj. Flow (vph)	185	45	873	224	28	854
RTOR Reduction (vph)	0	37	21	0	0	0
Lane Group Flow (vph)	185	8	1077	0	28	854
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	13.6	13.6	40.0		54.5	54.5
Effective Green, g (s)	13.6	13.6	40.0		54.5	54.5
Actuated g/C Ratio	0.17	0.17	0.50		0.68	0.68
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	300	269	1715		339	2410
v/s Ratio Prot	c0.10		c0.31		0.00	c0.24
v/s Ratio Perm		0.00			0.05	
v/c Ratio	0.62	0.03	0.63		0.08	0.35
Uniform Delay, d1	30.8	27.7	14.6		7.4	5.4
Progression Factor	1.00	1.00	0.79		1.00	1.00
Incremental Delay, d2	3.7	0.0	1.7		0.1	0.4
Delay (s)	34.5	27.7	13.2		7.5	5.8
Level of Service	C	C	B		A	A
Approach Delay (s)	33.2		13.2			5.8
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

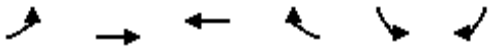
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	10	30	862	634	76
Future Volume (vph)	110	10	30	862	634	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3482	
Flt Permitted	0.95	1.00	0.22	1.00	1.00	
Satd. Flow (perm)	3433	1583	414	3539	3482	
Peak-hour factor, PHF	0.60	0.60	0.85	0.85	0.61	0.61
Adj. Flow (vph)	183	17	35	1014	1039	125
RTOR Reduction (vph)	0	15	0	0	7	0
Lane Group Flow (vph)	183	2	35	1014	1157	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	9.6	9.6	58.1	58.1	58.1	
Effective Green, g (s)	9.6	9.6	58.1	58.1	58.1	
Actuated g/C Ratio	0.12	0.12	0.73	0.73	0.73	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	411	189	300	2570	2528	
v/s Ratio Prot	c0.05			0.29	c0.33	
v/s Ratio Perm		0.00	0.08			
v/c Ratio	0.45	0.01	0.12	0.39	0.46	
Uniform Delay, d1	32.7	31.0	3.3	4.2	4.5	
Progression Factor	1.00	1.00	0.70	0.67	0.59	
Incremental Delay, d2	0.8	0.0	0.7	0.4	0.6	
Delay (s)	33.5	31.0	3.0	3.2	3.2	
Level of Service	C	C	A	A	A	
Approach Delay (s)	33.3			3.2	3.2	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

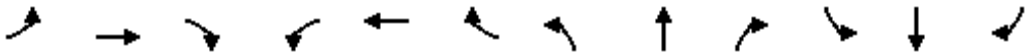
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	339	572	323	56	16	82
Future Volume (Veh/h)	339	572	323	56	16	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.67	0.67	0.60	0.60
Hourly flow rate (vph)	413	698	482	84	27	137
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						8
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	566				1658	242
vC1, stage 1 conf vol					482	
vC2, stage 2 conf vol					1176	
vCu, unblocked vol	566				1658	242
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	59				81	82
cM capacity (veh/h)	1002				144	758

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	413	349	349	241	241	84	164
Volume Left	413	0	0	0	0	0	27
Volume Right	0	0	0	0	0	84	137
cSH	1002	1700	1700	1700	1700	1700	873
Volume to Capacity	0.41	0.21	0.21	0.14	0.14	0.05	0.19
Queue Length 95th (ft)	51	0	0	0	0	0	17
Control Delay (s)	11.1	0.0	0.0	0.0	0.0	0.0	14.9
Lane LOS	B						B
Approach Delay (s)	4.1			0.0			14.9
Approach LOS							B

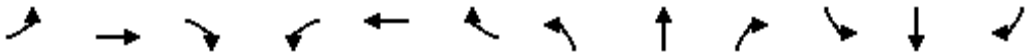
Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	0	36	1	1	0	111	840	2	8	523	113
Future Volume (Veh/h)	52	0	36	1	1	0	111	840	2	8	523	113
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.90	0.90	0.90	0.72	0.72	0.72
Hourly flow rate (vph)	87	0	60	2	2	0	123	933	2	11	726	157
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1540	2008	442	1565	2085	468	883			935		
vC1, stage 1 conf vol	826	826		1180	1180							
vC2, stage 2 conf vol	714	1181		385	905							
vCu, unblocked vol	1426	1930	242	1453	2014	468	718			935		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	65	100	91	99	99	100	85			98		
cM capacity (veh/h)	249	188	704	164	171	542	816			728		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	147	4	123	622	313	11	484	399
Volume Left	87	2	123	0	0	11	0	0
Volume Right	60	0	0	0	2	0	0	157
cSH	421	167	816	1700	1700	728	1700	1700
Volume to Capacity	0.35	0.02	0.15	0.37	0.18	0.02	0.28	0.23
Queue Length 95th (ft)	38	2	13	0	0	1	0	0
Control Delay (s)	20.3	27.1	10.2	0.0	0.0	10.0	0.0	0.0
Lane LOS	C	D	B			B		
Approach Delay (s)	20.3	27.1	1.2			0.1		
Approach LOS	C	D						

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	41.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	2	27	2	128	15	911	46	125	681	237
Future Volume (Veh/h)	27	0	2	27	2	128	15	911	46	125	681	237
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.88	0.88	0.95	0.74	0.74	0.74	0.66	0.66	0.66
Hourly flow rate (vph)	45	0	3	31	2	135	20	1231	62	189	1032	359
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.94	0.94	0.91	0.94	0.94	0.89	0.91			0.89		
vC, conflicting volume	2382	2924	696	2199	3072	646	1392			1293		
vC1, stage 1 conf vol	1590	1590		1302	1302							
vC2, stage 2 conf vol	792	1333		897	1770							
vCu, unblocked vol	1893	2471	460	1698	2630	356	1227			1082		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	38	100	99	79	97	76	96			67		
cM capacity (veh/h)	72	45	496	149	70	570	511			570		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	45	3	33	135	20	821	472	189	688	703
Volume Left	45	0	31	0	20	0	0	189	0	0
Volume Right	0	3	0	135	0	0	62	0	0	359
cSH	72	496	139	570	511	1700	1700	570	1700	1700
Volume to Capacity	0.62	0.01	0.24	0.24	0.04	0.48	0.28	0.33	0.40	0.41
Queue Length 95th (ft)	68	0	22	23	3	0	0	36	0	0
Control Delay (s)	115.1	12.3	38.7	13.3	12.3	0.0	0.0	14.4	0.0	0.0
Lane LOS	F	B	E	B	B			B		
Approach Delay (s)	108.6		18.3		0.2			1.7		
Approach LOS	F		C							

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	18	14	27	22	14
Future Volume (Veh/h)	16	18	14	27	22	14
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	25	28	22	42	30	19
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	123	44			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	123	44			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	97			98	
cM capacity (veh/h)	854	1025			1536	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	53	64	49
Volume Left	25	0	30
Volume Right	28	42	0
cSH	937	1700	1536
Volume to Capacity	0.06	0.04	0.02
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.1	0.0	4.6
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	4.6
Approach LOS	A		

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	924	0	1	426	3	3	11	8	6	1	14
Future Volume (Veh/h)	18	924	0	1	426	3	3	11	8	6	1	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	22	1127	0	1	526	4	4	16	12	7	1	15
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	533			1128			1454	1707	564	1160	1705	269
vC1, stage 1 conf vol							1172	1172		533	533	
vC2, stage 2 conf vol							282	535		628	1172	
vCu, unblocked vol	533			1128			1454	1707	564	1160	1705	269
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)							4.0	4.0		4.0	4.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	96	98	99	100	98
cM capacity (veh/h)	1028			614			427	378	634	537	380	839

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	22	751	376	1	351	179	32	23
Volume Left	22	0	0	1	0	0	4	7
Volume Right	0	0	0	0	0	4	12	15
cSH	1028	1700	1700	614	1700	1700	453	686
Volume to Capacity	0.02	0.44	0.22	0.00	0.21	0.11	0.07	0.03
Queue Length 95th (ft)	2	0	0	0	0	0	6	3
Control Delay (s)	8.6	0.0	0.0	10.9	0.0	0.0	13.5	10.4
Lane LOS	A			B			B	B
Approach Delay (s)	0.2			0.0			13.5	10.4
Approach LOS							B	B

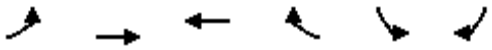
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	35.9%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	193	26	10	122	17	15
Future Volume (Veh/h)	193	26	10	122	17	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.83	0.83	0.60	0.60
Hourly flow rate (vph)	224	30	12	147	28	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			254		410	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		410	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	97
cM capacity (veh/h)			1311		592	800

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	254	159	53
Volume Left	0	12	28
Volume Right	30	0	25
cSH	1700	1311	675
Volume to Capacity	0.15	0.01	0.08
Queue Length 95th (ft)	0	1	6
Control Delay (s)	0.0	0.7	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	10.8
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	96	37	81	48	70	39
Future Volume (Veh/h)	96	37	81	48	70	39
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.79	0.79	0.73	0.73	0.69	0.69
Hourly flow rate (vph)	122	47	111	66	101	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	177				435	144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	177				435	144
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				81	94
cM capacity (veh/h)	1399				528	903

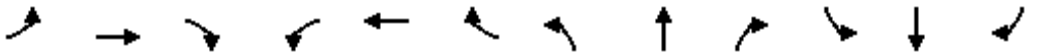
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	169	177	158
Volume Left	122	0	101
Volume Right	0	66	57
cSH	1399	1700	621
Volume to Capacity	0.09	0.10	0.25
Queue Length 95th (ft)	7	0	25
Control Delay (s)	5.8	0.0	12.8
Lane LOS	A		B
Approach Delay (s)	5.8	0.0	12.8
Approach LOS			B

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	396	0	482	0	0	0	0	1235	86	62	538	0
Future Volume (vph)	396	0	482	0	0	0	0	1235	86	62	538	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	0.99					1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1483	1484					3539	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1681	1483	1484					3539	1583	167	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	421	0	513	0	0	0	0	1453	101	70	604	0
RTOR Reduction (vph)	0	109	207	0	0	0	0	0	53	0	0	0
Lane Group Flow (vph)	324	203	91	0	0	0	0	1453	48	70	604	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	17.7	17.7	17.7					38.2	38.2	49.9	49.9	
Effective Green, g (s)	17.7	17.7	17.7					38.2	38.2	49.9	49.9	
Actuated g/C Ratio	0.22	0.22	0.22					0.48	0.48	0.62	0.62	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	371	328	328					1689	755	210	2207	
v/s Ratio Prot								c0.41		0.02	c0.17	
v/s Ratio Perm	c0.19	0.14	0.06						0.03	0.19		
v/c Ratio	0.87	0.62	0.28					0.86	0.06	0.33	0.27	
Uniform Delay, d1	30.1	28.1	25.8					18.5	11.3	23.0	6.8	
Progression Factor	1.00	1.00	1.00					0.88	0.90	0.59	0.48	
Incremental Delay, d2	19.2	2.4	0.2					5.6	0.1	0.3	0.3	
Delay (s)	49.2	30.5	26.0					21.9	10.2	13.8	3.5	
Level of Service	D	C	C					C	B	B	A	
Approach Delay (s)		35.6			0.0			21.1			4.6	
Approach LOS		D			A			C			A	

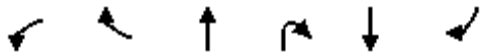
Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	318	168	285	298	153	339	477	315	247	260	244
Future Volume (vph)	78	318	168	285	298	153	339	477	315	247	260	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3202		1703	3406	1524
Flt Permitted	0.40	1.00	1.00	0.36	1.00	1.00	0.58	1.00		0.18	1.00	1.00
Satd. Flow (perm)	733	1827	1553	677	1863	1583	1045	3202		320	3406	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	346	183	303	317	163	357	502	332	260	274	257
RTOR Reduction (vph)	0	0	132	0	0	113	0	126	0	0	0	193
Lane Group Flow (vph)	85	346	51	303	317	50	357	708	0	260	274	64
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	30.6	25.0	25.0	35.8	27.6	27.6	32.0	22.4		32.0	22.4	22.4
Effective Green, g (s)	30.6	25.0	25.0	35.8	27.6	27.6	32.0	22.4		32.0	22.4	22.4
Actuated g/C Ratio	0.34	0.28	0.28	0.40	0.31	0.31	0.36	0.25		0.36	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	311	507	431	368	571	485	441	796		261	847	379
v/s Ratio Prot	0.02	0.19		c0.07	0.17		0.09	0.22		c0.11	0.08	
v/s Ratio Perm	0.08		0.03	c0.25		0.03	0.20			c0.25		0.04
v/c Ratio	0.27	0.68	0.12	0.82	0.56	0.10	0.81	0.89		1.00	0.32	0.17
Uniform Delay, d1	27.0	29.0	24.3	29.5	26.1	22.3	26.4	32.6		35.6	27.6	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	7.3	0.6	13.8	3.9	0.4	10.5	14.1		54.3	1.0	1.0
Delay (s)	27.4	36.2	24.8	43.3	29.9	22.8	36.9	46.7		89.9	28.6	27.5
Level of Service	C	D	C	D	C	C	D	D		F	C	C
Approach Delay (s)		31.6			33.6			43.8			48.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	102	160	1084	547	498	478
Future Volume (vph)	102	160	1084	547	498	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.93	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3279	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3279	
Peak-hour factor, PHF	0.78	0.78	0.89	0.92	0.90	0.90
Adj. Flow (vph)	131	205	1218	595	553	531
RTOR Reduction (vph)	0	109	0	152	136	0
Lane Group Flow (vph)	131	96	1218	443	948	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	8.2	8.2	59.5	59.5	59.5	
Effective Green, g (s)	8.2	8.2	59.5	59.5	59.5	
Actuated g/C Ratio	0.10	0.10	0.74	0.74	0.74	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	181	162	2632	1177	2438	
v/s Ratio Prot	c0.07	0.06	c0.34		0.29	
v/s Ratio Perm				0.28		
v/c Ratio	0.72	0.59	0.46	0.38	0.39	
Uniform Delay, d1	34.8	34.3	4.0	3.6	3.7	
Progression Factor	1.00	1.00	0.09	0.08	4.75	
Incremental Delay, d2	11.5	3.5	0.3	0.5	0.4	
Delay (s)	46.3	37.8	0.7	0.8	17.9	
Level of Service	D	D	A	A	B	
Approach Delay (s)			0.8		17.9	
Approach LOS			A		B	

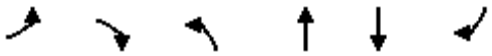
Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	391	118	78	374	331	91	474	77	286	406	248
Future Volume (vph)	114	391	118	78	374	331	91	474	77	286	406	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3416		1770	1863	1583	1770	3465		1770	3338	
Flt Permitted	0.18	1.00		0.35	1.00	1.00	0.36	1.00		0.35	1.00	
Satd. Flow (perm)	339	3416		660	1863	1583	671	3465		644	3338	
Peak-hour factor, PHF	0.95	0.95	0.95	0.76	0.76	0.76	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	120	412	124	103	492	436	121	632	103	308	437	267
RTOR Reduction (vph)	0	36	0	0	0	189	0	16	0	0	43	0
Lane Group Flow (vph)	120	500	0	103	492	247	121	719	0	308	661	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	22.0	22.0		22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)	22.0	22.0		22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio	0.28	0.28		0.28	0.28	0.28	0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	93	939		181	512	435	385	1992		370	1919	
v/s Ratio Prot		0.15			0.26			0.21			0.20	
v/s Ratio Perm	c0.35			0.16		0.16	0.18			c0.48		
v/c Ratio	1.29	0.53		0.57	0.96	0.57	0.31	0.36		0.83	0.34	
Uniform Delay, d1	29.0	24.6		24.9	28.6	24.9	8.8	9.1		13.9	9.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.14	1.36	
Incremental Delay, d2	189.8	0.6		4.1	29.9	1.7	2.1	0.5		18.6	0.5	
Delay (s)	218.8	25.2		29.0	58.5	26.6	10.9	9.6		34.5	12.7	
Level of Service	F	C		C	E	C	B	A		C	B	
Approach Delay (s)		60.6			42.1			9.8			19.3	
Approach LOS		E			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	157	94	173	1187	897	243
Future Volume (vph)	157	94	173	1187	897	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1561	1770	3539	3426	
Flt Permitted	0.95	1.00	0.15	1.00	1.00	
Satd. Flow (perm)	1770	1561	284	3539	3426	
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.94	0.94
Adj. Flow (vph)	171	102	190	1304	954	259
RTOR Reduction (vph)	0	86	0	0	27	0
Lane Group Flow (vph)	171	16	190	1304	1186	0
Confl. Peds. (#/hr)		1				
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.9	12.9	54.8	54.8	39.8	
Effective Green, g (s)	12.9	12.9	54.8	54.8	39.8	
Actuated g/C Ratio	0.16	0.16	0.68	0.68	0.50	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	285	251	356	2424	1704	
v/s Ratio Prot	c0.10		0.06	c0.37	c0.35	
v/s Ratio Perm		0.01	0.31			
v/c Ratio	0.60	0.07	0.53	0.54	0.70	
Uniform Delay, d1	31.2	28.4	18.5	6.3	15.5	
Progression Factor	1.00	1.00	0.70	0.54	0.71	
Incremental Delay, d2	3.4	0.1	1.4	0.8	2.2	
Delay (s)	34.5	28.6	14.3	4.2	13.1	
Level of Service	C	C	B	A	B	
Approach Delay (s)	32.3			5.5	13.1	
Approach LOS	C			A	B	

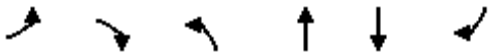
Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	46	1196	148	48	1007
Future Volume (vph)	133	46	1196	148	48	1007
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3481		1770	3539
Flt Permitted	0.95	1.00	1.00		0.11	1.00
Satd. Flow (perm)	1770	1583	3481		210	3539
Peak-hour factor, PHF	0.80	0.80	0.93	0.93	0.89	0.89
Adj. Flow (vph)	166	58	1286	159	54	1131
RTOR Reduction (vph)	0	49	9	0	0	0
Lane Group Flow (vph)	166	9	1436	0	54	1131
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.8	12.8	38.9		55.3	55.3
Effective Green, g (s)	12.8	12.8	38.9		55.3	55.3
Actuated g/C Ratio	0.16	0.16	0.49		0.69	0.69
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	283	253	1692		252	2446
v/s Ratio Prot	c0.09		c0.41		0.01	c0.32
v/s Ratio Perm		0.01			0.13	
v/c Ratio	0.59	0.04	0.85		0.21	0.46
Uniform Delay, d1	31.1	28.4	18.0		14.3	5.6
Progression Factor	1.00	1.00	0.81		1.00	1.00
Incremental Delay, d2	3.1	0.1	4.8		0.4	0.6
Delay (s)	34.2	28.5	19.5		14.7	6.2
Level of Service	C	C	B		B	A
Approach Delay (s)	32.7		19.5			6.6
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

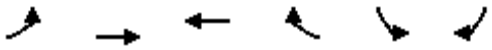
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	287	53	9	961	847	108
Future Volume (vph)	287	53	9	961	847	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3479	
Flt Permitted	0.95	1.00	0.26	1.00	1.00	
Satd. Flow (perm)	3433	1583	481	3539	3479	
Peak-hour factor, PHF	0.83	0.83	0.77	0.77	0.94	0.94
Adj. Flow (vph)	346	64	12	1248	901	115
RTOR Reduction (vph)	0	53	0	0	9	0
Lane Group Flow (vph)	346	11	12	1248	1007	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	13.5	13.5	54.2	54.2	54.2	
Effective Green, g (s)	13.5	13.5	54.2	54.2	54.2	
Actuated g/C Ratio	0.17	0.17	0.68	0.68	0.68	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	579	267	325	2397	2357	
v/s Ratio Prot	c0.10			c0.35	0.29	
v/s Ratio Perm		0.01	0.02			
v/c Ratio	0.60	0.04	0.04	0.52	0.43	
Uniform Delay, d1	30.7	27.8	4.3	6.4	5.9	
Progression Factor	1.00	1.00	0.80	0.74	0.54	
Incremental Delay, d2	1.7	0.1	0.2	0.8	0.5	
Delay (s)	32.4	27.9	3.6	5.5	3.7	
Level of Service	C	C	A	A	A	
Approach Delay (s)	31.7			5.5	3.7	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

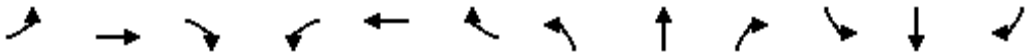
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	133	560	672	31	41	232
Future Volume (Veh/h)	133	560	672	31	41	232
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	141	596	707	33	46	261
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						8
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	740				1288	354
vC1, stage 1 conf vol					707	
vC2, stage 2 conf vol					581	
vCu, unblocked vol	740				1288	354
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	84				86	59
cM capacity (veh/h)	862				331	641

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	141	298	298	354	354	33	307
Volume Left	141	0	0	0	0	0	46
Volume Right	0	0	0	0	0	33	261
cSH	862	1700	1700	1700	1700	1700	754
Volume to Capacity	0.16	0.18	0.18	0.21	0.21	0.02	0.41
Queue Length 95th (ft)	15	0	0	0	0	0	50
Control Delay (s)	10.0	0.0	0.0	0.0	0.0	0.0	14.9
Lane LOS	A						B
Approach Delay (s)	1.9			0.0			14.9
Approach LOS							B

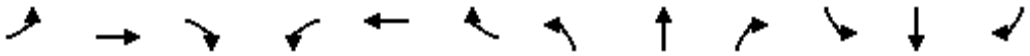
Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	0	77	5	0	8	101	875	5	4	818	78
Future Volume (Veh/h)	87	0	77	5	0	8	101	875	5	4	818	78
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.65	0.65	0.60	0.60	0.60	0.87	0.87	0.87	0.95	0.95	0.95
Hourly flow rate (vph)	134	0	118	8	0	13	116	1006	6	4	861	82
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1659	2154	472	1680	2192	507	943			1012		
vC1, stage 1 conf vol	910	910		1241	1241							
vC2, stage 2 conf vol	749	1244		438	951							
vCu, unblocked vol	1508	2059	187	1531	2101	507	712			1012		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	43	100	84	95	100	97	85			99		
cM capacity (veh/h)	236	180	740	150	164	510	794			681		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	252	21	116	671	341	4	574	369
Volume Left	134	8	116	0	0	4	0	0
Volume Right	118	13	0	0	6	0	0	82
cSH	443	267	794	1700	1700	681	1700	1700
Volume to Capacity	0.57	0.08	0.15	0.39	0.20	0.01	0.34	0.22
Queue Length 95th (ft)	86	6	13	0	0	0	0	0
Control Delay (s)	25.6	19.6	10.3	0.0	0.0	10.3	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	25.6	19.6	1.1			0.0		
Approach LOS	D	C						

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	51.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	5	45	40	1	80	15	1180	53	74	870	76
Future Volume (Veh/h)	61	5	45	40	1	80	15	1180	53	74	870	76
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.69	0.69	0.69	0.85	0.85	0.85	0.86	0.86	0.86
Hourly flow rate (vph)	84	7	62	58	1	116	18	1388	62	86	1012	88
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.86	0.86	0.93	0.86	0.86	0.83	0.93			0.83		
vC, conflicting volume	2076	2715	551	2198	2728	725	1101			1450		
vC1, stage 1 conf vol	1229	1229		1455	1455							
vC2, stage 2 conf vol	846	1486		744	1273							
vCu, unblocked vol	1562	2303	366	1704	2318	252	957			1127		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	45	94	89	61	99	81	97			83		
cM capacity (veh/h)	153	110	586	149	142	619	663			509		

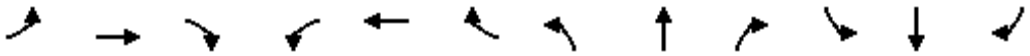
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	84	69	59	116	18	925	525	86	675	425
Volume Left	84	0	58	0	18	0	0	86	0	0
Volume Right	0	62	0	116	0	0	62	0	0	88
cSH	153	407	149	619	663	1700	1700	509	1700	1700
Volume to Capacity	0.55	0.17	0.40	0.19	0.03	0.54	0.31	0.17	0.40	0.25
Queue Length 95th (ft)	69	15	43	17	2	0	0	15	0	0
Control Delay (s)	53.8	15.7	44.1	12.1	10.6	0.0	0.0	13.5	0.0	0.0
Lane LOS	F	C	E	B	B			B		
Approach Delay (s)	36.6		22.9		0.1			1.0		
Approach LOS	E		C							

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	58.5%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	33	33	18	34	27	37
Future Volume (Veh/h)	33	33	18	34	27	37
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	55	55	23	44	37	51
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	171	45			67	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	171	45			67	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	95			98	
cM capacity (veh/h)	799	1025			1535	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	110	67	88
Volume Left	55	0	37
Volume Right	55	44	0
cSH	898	1700	1535
Volume to Capacity	0.12	0.04	0.02
Queue Length 95th (ft)	10	0	2
Control Delay (s)	9.6	0.0	3.2
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	3.2
Approach LOS	A		

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	688	4	18	998	8	1	7	8	24	15	28
Future Volume (Veh/h)	31	688	4	18	998	8	1	7	8	24	15	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	33	724	4	23	1248	10	1	8	10	40	25	47
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1259			728			1522	2097	364	1742	2094	630
vC1, stage 1 conf vol							792	792		1300	1300	
vC2, stage 2 conf vol							730	1305		442	794	
vCu, unblocked vol	1259			728			1522	2097	364	1742	2094	630
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)							4.0	4.0		4.0	4.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			97			100	97	99	89	92	92
cM capacity (veh/h)	548			871			409	305	770	373	320	595

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	33	483	245	23	832	426	19	112
Volume Left	33	0	0	23	0	0	1	40
Volume Right	0	0	4	0	0	10	10	47
cSH	548	1700	1700	871	1700	1700	456	424
Volume to Capacity	0.06	0.28	0.14	0.03	0.49	0.25	0.04	0.26
Queue Length 95th (ft)	5	0	0	2	0	0	3	26
Control Delay (s)	12.0	0.0	0.0	9.2	0.0	0.0	13.2	16.5
Lane LOS	B			A			B	C
Approach Delay (s)	0.5			0.2			13.2	16.5
Approach LOS							B	C

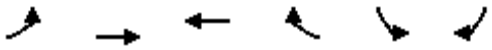
Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	45.0%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	221	21	43	305	20	31
Future Volume (Veh/h)	221	21	43	305	20	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	266	25	49	347	23	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			291		724	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			291		724	278
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		94	95
cM capacity (veh/h)			1271		378	760

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	291	396	59
Volume Left	0	49	23
Volume Right	25	0	36
cSH	1700	1271	545
Volume to Capacity	0.17	0.04	0.11
Queue Length 95th (ft)	0	3	9
Control Delay (s)	0.0	1.3	12.4
Lane LOS		A	B
Approach Delay (s)	0.0	1.3	12.4
Approach LOS			B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	99	140	267	112	112	140
Future Volume (Veh/h)	99	140	267	112	112	140
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.82	0.82	0.88	0.88
Hourly flow rate (vph)	111	157	326	137	127	159
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	463				774	394
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463				774	394
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				62	76
cM capacity (veh/h)	1098				330	655

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	268	463	286
Volume Left	111	0	127
Volume Right	0	137	159
cSH	1098	1700	456
Volume to Capacity	0.10	0.27	0.63
Queue Length 95th (ft)	8	0	105
Control Delay (s)	4.1	0.0	25.3
Lane LOS	A		D
Approach Delay (s)	4.1	0.0	25.3
Approach LOS			D

Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

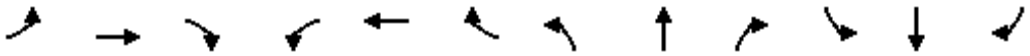
APPENDIX I-2

DORT HIGHWAY EXTENSION ALTERNATIVE A AND B INTERSECTIONS WITH ROUNDABOUTS AT I-75 RAMPS

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	527	760	208
Demand Flow Rate, veh/h	0	537	775	212
Vehicles Circulating, veh/h	212	244	212	62
Vehicles Exiting, veh/h	62	743	0	719
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	10.7	10.6	5.3
Approach LOS	-	B	B	A

Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.115	0.885	0.315	0.685	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	62	475	244	531	212	0
Cap Entry Lane, veh/h	885	885	914	914	1062	1938
Entry HV Adj Factor	0.984	0.981	0.980	0.981	0.981	0.980
Flow Entry, veh/h	61	466	239	521	208	0
Cap Entry, veh/h	871	869	896	897	1042	1900
V/C Ratio	0.070	0.537	0.267	0.581	0.200	0.000
Control Delay, s/veh	4.8	11.5	6.8	12.3	5.3	0.0
LOS	A	B	A	B	A	A
95th %tile Queue, veh	0	3	1	4	1	0

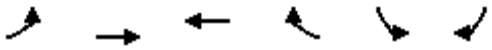


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	39	5	13	24	264	5	132	44	522	122	5
Future Volume (Veh/h)	5	39	5	13	24	264	5	132	44	522	122	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	42	5	14	26	287	5	143	48	567	133	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1722	1470	136	1470	1449	167	138			191		
vC1, stage 1 conf vol	1270	1270		177	177							
vC2, stage 2 conf vol	453	201		1293	1272							
vCu, unblocked vol	1722	1470	136	1470	1449	167	138			191		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	79	99	93	89	69	100			59		
cM capacity (veh/h)	83	198	956	198	229	928	1446			1383		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	52	327	5	191	567	138
Volume Left	5	14	5	0	567	0
Volume Right	5	287	0	48	0	5
cSH	188	662	1446	1700	1383	1700
Volume to Capacity	0.28	0.49	0.00	0.11	0.41	0.08
Queue Length 95th (ft)	27	69	0	0	51	0
Control Delay (s)	31.4	15.6	7.5	0.0	9.4	0.0
Lane LOS	D	C	A		A	
Approach Delay (s)	31.4	15.6	0.2		7.6	
Approach LOS	D	C				

Intersection Summary				
Average Delay	9.5			
Intersection Capacity Utilization	69.1%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value

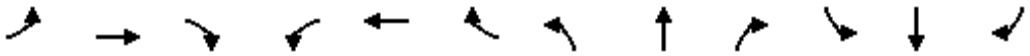


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	154	803	382	23	108	37
Future Volume (Veh/h)	154	803	382	23	108	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	167	873	415	25	117	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	440				1198	220
vC1, stage 1 conf vol					428	
vC2, stage 2 conf vol					770	
vCu, unblocked vol	440				1198	220
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)					4.0	
tF (s)	2.2				3.5	3.3
p0 queue free %	85				76	95
cM capacity (veh/h)	1116				480	883

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	167	436	436	277	163	117	40
Volume Left	167	0	0	0	0	117	0
Volume Right	0	0	0	0	25	0	40
cSH	1116	1700	1700	1700	1700	480	883
Volume to Capacity	0.15	0.26	0.26	0.16	0.10	0.24	0.05
Queue Length 95th (ft)	13	0	0	0	0	24	4
Control Delay (s)	8.8	0.0	0.0	0.0	0.0	14.9	9.3
Lane LOS	A					B	A
Approach Delay (s)	1.4			0.0		13.5	
Approach LOS						B	

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	87	13	14	80	26	14	351	36	10	622	38
Future Volume (Veh/h)	108	87	13	14	80	26	14	351	36	10	622	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	95	14	15	87	28	15	382	39	11	676	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1202	1170	696	1191	1170	402	717			421		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1202	1170	696	1191	1170	402	717			421		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	52	69	97	94	72	96	98			99		
cM capacity (veh/h)	242	308	559	241	307	743	884			1138		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	109	15	115	15	421	11	717
Volume Left	117	0	15	0	15	0	11	0
Volume Right	0	14	0	28	0	39	0	41
cSH	242	327	241	359	884	1700	1138	1700
Volume to Capacity	0.48	0.33	0.06	0.32	0.02	0.25	0.01	0.42
Queue Length 95th (ft)	61	36	5	34	1	0	1	0
Control Delay (s)	33.1	21.4	20.9	19.7	9.1	0.0	8.2	0.0
Lane LOS	D	C	C	C	A		A	
Approach Delay (s)	27.5		19.8		0.3		0.1	
Approach LOS	D		C					

Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Intersection	
Intersection Delay, s/veh	5.6
Intersection LOS	A

Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	75	705	1083	0
Demand Flow Rate, veh/h	76	720	1105	0
Vehicles Circulating, veh/h	387	354	76	387
Vehicles Exiting, veh/h	0	76	387	687
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	10.8	2.2	0.0
Approach LOS	A	B	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.538	0.463	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	76	0	387	333	354	751
Cap Entry Lane, veh/h	767	1938	793	793	1047	1938
Entry HV Adj Factor	0.987	0.980	0.980	0.979	0.980	0.980
Flow Entry, veh/h	75	0	379	326	347	736
Cap Entry, veh/h	757	1900	778	776	1027	1900
V/C Ratio	0.099	0.000	0.488	0.420	0.338	0.387
Control Delay, s/veh	5.8	0.0	11.4	10.1	7.0	0.0
LOS	A	A	B	B	A	A
95th %tile Queue, veh	0	0	3	2	2	2

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	599	768	148
Demand Flow Rate, veh/h	0	611	784	151
Vehicles Circulating, veh/h	151	492	151	58
Vehicles Exiting, veh/h	58	443	0	1045
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	25.1	8.9	4.7
Approach LOS	-	D	A	A

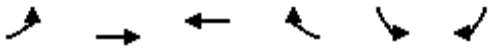
Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.095	0.905	0.628	0.372	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	58	553	492	292	151	0
Cap Entry Lane, veh/h	691	691	972	972	1066	1938
Entry HV Adj Factor	0.983	0.980	0.980	0.979	0.980	0.980
Flow Entry, veh/h	57	542	482	286	148	0
Cap Entry, veh/h	679	677	953	952	1045	1900
V/C Ratio	0.084	0.800	0.506	0.301	0.142	0.000
Control Delay, s/veh	6.2	27.1	10.1	6.9	4.7	0.0
LOS	A	D	B	A	A	A
95th %tile Queue, veh	0	8	3	1	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	50	11	48	52	418	0	90	24	246	168	14
Future Volume (Veh/h)	0	50	11	48	52	418	0	90	24	246	168	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	12	52	57	454	0	98	26	267	183	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1305	848	190	867	843	111	198			124		
vC1, stage 1 conf vol	724	724		111	111							
vC2, stage 2 conf vol	580	124		756	732							
vCu, unblocked vol	1305	848	190	867	843	111	198			124		
tC, single (s)	7.1	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	6.1	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	88	99	88	88	54	100			82		
cM capacity (veh/h)	57	444	908	434	458	978	1375			1463		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	66	563	0	124	267	198
Volume Left	0	52	0	0	267	0
Volume Right	12	454	0	26	0	15
cSH	489	795	1700	1700	1463	1700
Volume to Capacity	0.13	0.71	0.00	0.07	0.18	0.12
Queue Length 95th (ft)	12	151	0	0	17	0
Control Delay (s)	13.5	19.7	0.0	0.0	8.0	0.0
Lane LOS	B	C			A	
Approach Delay (s)	13.5	19.7	0.0		4.6	
Approach LOS	B	C				

Intersection Summary				
Average Delay	11.6			
Intersection Capacity Utilization	64.8%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value

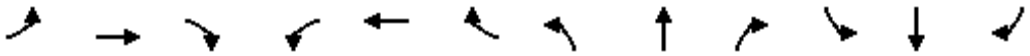


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	111	586	899	5	107	119
Future Volume (Veh/h)	111	586	899	5	107	119
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	637	977	5	116	129
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	982				1540	491
vC1, stage 1 conf vol					980	
vC2, stage 2 conf vol					560	
vCu, unblocked vol	982				1540	491
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)					4.0	
tF (s)	2.2				3.5	3.3
p0 queue free %	83				73	81
cM capacity (veh/h)	699				427	682

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	121	318	318	651	331	116	129
Volume Left	121	0	0	0	0	116	0
Volume Right	0	0	0	0	5	0	129
cSH	699	1700	1700	1700	1700	427	682
Volume to Capacity	0.17	0.19	0.19	0.38	0.19	0.27	0.19
Queue Length 95th (ft)	16	0	0	0	0	27	17
Control Delay (s)	11.2	0.0	0.0	0.0	0.0	16.5	11.5
Lane LOS	B					C	B
Approach Delay (s)	1.8			0.0		13.9	
Approach LOS						B	

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	218	28	19	333	55	3	490	15	6	381	12
Future Volume (Veh/h)	6	218	28	19	333	55	3	490	15	6	381	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	237	30	21	362	60	3	533	16	7	414	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1214	990	420	1124	988	541	427			549		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1214	990	420	1124	988	541	427			549		
tC, single (s)	*4.2	*4.2	*4.2	*4.2	*4.2	*4.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	49	96	92	22	92	100			99		
cM capacity (veh/h)	137	462	801	259	463	733	1132			1021		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	267	21	422	3	549	7	427
Volume Left	7	0	21	0	3	0	7	0
Volume Right	0	30	0	60	0	16	0	13
cSH	137	485	259	488	1132	1700	1021	1700
Volume to Capacity	0.05	0.55	0.08	0.86	0.00	0.32	0.01	0.25
Queue Length 95th (ft)	4	82	7	228	0	0	1	0
Control Delay (s)	32.7	21.1	20.1	43.5	8.2	0.0	8.6	0.0
Lane LOS	D	C	C	E	A		A	
Approach Delay (s)	21.4		42.4		0.0		0.1	
Approach LOS	C		E					

Intersection Summary				
Average Delay	14.5			
Intersection Capacity Utilization	54.2%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

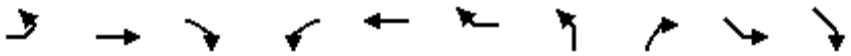
Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	16	1024	775	0
Demand Flow Rate, veh/h	16	1045	790	0
Vehicles Circulating, veh/h	501	268	16	501
Vehicles Exiting, veh/h	0	16	501	812
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.5	13.6	1.9	0.0
Approach LOS	A	B	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.479	0.521	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	16	0	501	544	268	522
Cap Entry Lane, veh/h	685	1938	864	864	1112	1938
Entry HV Adj Factor	1.000	0.980	0.980	0.980	0.981	0.980
Flow Entry, veh/h	16	0	491	533	263	512
Cap Entry, veh/h	685	1900	847	847	1091	1900
V/C Ratio	0.023	0.000	0.580	0.629	0.241	0.269
Control Delay, s/veh	5.5	0.0	12.8	14.3	5.5	0.0
LOS	A	A	B	B	A	A
95th %tile Queue, veh	0	0	4	5	1	1

APPENDIX I-3

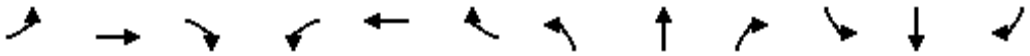
DORT HIGHWAY EXTENSION ALTERNATIVE A AND B INTERSECTIONS WITH STOP SIGNS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Stop		Stop	
Traffic Volume (vph)	0	220	479	191	0	555	56	429	0	0
Future Volume (vph)	0	220	479	191	0	555	56	429	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	239	521	208	0	603	61	466	0	0

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	239	521	208	603	61	466
Volume Left (vph)	0	0	208	0	0	0
Volume Right (vph)	0	521	0	603	0	466
Hadj (s)	0.03	-0.67	0.23	-0.57	0.03	-0.67
Departure Headway (s)	6.7	6.0	7.5	3.2	7.0	6.3
Degree Utilization, x	0.44	0.86	0.43	0.54	0.12	0.82
Capacity (veh/h)	524	590	452	1117	492	552
Control Delay (s)	13.7	34.3	16.0	9.8	9.8	30.7
Approach Delay (s)	27.9		11.4		28.3	
Approach LOS	D		B		D	

Intersection Summary				
Delay	21.6			
Level of Service	C			
Intersection Capacity Utilization	46.9%	ICU Level of Service		A
Analysis Period (min)	15			

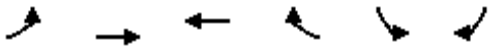


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	39	5	13	24	264	5	132	44	522	122	5
Future Volume (Veh/h)	5	39	5	13	24	264	5	132	44	522	122	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	42	5	14	26	287	5	143	48	567	133	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1722	1470	136	1470	1449	167	138			191		
vC1, stage 1 conf vol	1270	1270		177	177							
vC2, stage 2 conf vol	453	201		1293	1272							
vCu, unblocked vol	1722	1470	136	1470	1449	167	138			191		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	79	99	93	89	69	100			59		
cM capacity (veh/h)	83	198	956	198	229	928	1446			1383		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	52	327	5	191	567	138
Volume Left	5	14	5	0	567	0
Volume Right	5	287	0	48	0	5
cSH	188	662	1446	1700	1383	1700
Volume to Capacity	0.28	0.49	0.00	0.11	0.41	0.08
Queue Length 95th (ft)	27	69	0	0	51	0
Control Delay (s)	31.4	15.6	7.5	0.0	9.4	0.0
Lane LOS	D	C	A		A	
Approach Delay (s)	31.4	15.6	0.2		7.6	
Approach LOS	D	C				

Intersection Summary				
Average Delay	9.5			
Intersection Capacity Utilization	69.1%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value

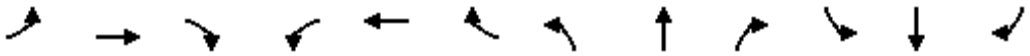


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	154	803	382	23	108	37
Future Volume (Veh/h)	154	803	382	23	108	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	167	873	415	25	117	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	440				1198	220
vC1, stage 1 conf vol					428	
vC2, stage 2 conf vol					770	
vCu, unblocked vol	440				1198	220
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)					4.0	
tF (s)	2.2				3.5	3.3
p0 queue free %	85				76	95
cM capacity (veh/h)	1116				480	883

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	167	436	436	277	163	117	40
Volume Left	167	0	0	0	0	117	0
Volume Right	0	0	0	0	25	0	40
cSH	1116	1700	1700	1700	1700	480	883
Volume to Capacity	0.15	0.26	0.26	0.16	0.10	0.24	0.05
Queue Length 95th (ft)	13	0	0	0	0	24	4
Control Delay (s)	8.8	0.0	0.0	0.0	0.0	14.9	9.3
Lane LOS	A					B	A
Approach Delay (s)	1.4			0.0		13.5	
Approach LOS						B	

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

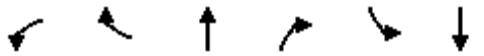


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	87	13	14	80	26	14	351	36	10	622	38
Future Volume (Veh/h)	108	87	13	14	80	26	14	351	36	10	622	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	95	14	15	87	28	15	382	39	11	676	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1202	1170	696	1191	1170	402	717			421		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1202	1170	696	1191	1170	402	717			421		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	52	69	97	94	72	96	98			99		
cM capacity (veh/h)	242	308	559	241	307	743	884			1138		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	109	15	115	15	421	11	717
Volume Left	117	0	15	0	15	0	11	0
Volume Right	0	14	0	28	0	39	0	41
cSH	242	327	241	359	884	1700	1138	1700
Volume to Capacity	0.48	0.33	0.06	0.32	0.02	0.25	0.01	0.42
Queue Length 95th (ft)	61	36	5	34	1	0	1	0
Control Delay (s)	33.1	21.4	20.9	19.7	9.1	0.0	8.2	0.0
Lane LOS	D	C	C	C	A		A	
Approach Delay (s)	27.5		19.8		0.3		0.1	
Approach LOS	D		C					

Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			

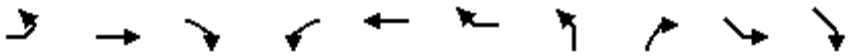
* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	69	0	349	300	319	677
Future Volume (Veh/h)	69	0	349	300	319	677
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	0	379	326	347	736
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1809	379			705	
vC1, stage 1 conf vol	379					
vC2, stage 2 conf vol	1430					
vCu, unblocked vol	1809	379			705	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	43	100			61	
cM capacity (veh/h)	131	668			893	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	75	379	326	347	736
Volume Left	75	0	0	347	0
Volume Right	0	0	326	0	0
cSH	131	1700	1700	893	1700
Volume to Capacity	0.57	0.22	0.19	0.39	0.43
Queue Length 95th (ft)	72	0	0	46	0
Control Delay (s)	64.5	0.0	0.0	11.6	0.0
Lane LOS	F			B	
Approach Delay (s)	64.5	0.0		3.7	
Approach LOS	F				

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Stop		Stop	
Traffic Volume (vph)	0	443	263	136	0	350	52	499	0	0
Future Volume (vph)	0	443	263	136	0	350	52	499	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	482	286	148	0	380	57	542	0	0

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	482	286	148	380	57	542
Volume Left (vph)	0	0	148	0	0	0
Volume Right (vph)	0	286	0	380	0	542
Hadj (s)	0.03	-0.67	0.23	-0.57	0.03	-0.67
Departure Headway (s)	6.8	6.1	7.8	3.2	7.0	6.3
Degree Utilization, x	0.91	0.49	0.32	0.34	0.11	0.95
Capacity (veh/h)	521	575	458	1113	498	566
Control Delay (s)	45.8	13.6	14.4	7.8	9.7	50.1
Approach Delay (s)	33.8		9.7		46.2	
Approach LOS	D		A		E	

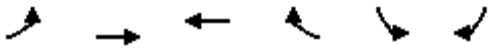
Intersection Summary				
Delay	31.0			
Level of Service	D			
Intersection Capacity Utilization	60.9%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	50	11	48	52	418	0	90	24	246	168	14
Future Volume (Veh/h)	0	50	11	48	52	418	0	90	24	246	168	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	12	52	57	454	0	98	26	267	183	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1305	848	190	867	843	111	198			124		
vC1, stage 1 conf vol	724	724		111	111							
vC2, stage 2 conf vol	580	124		756	732							
vCu, unblocked vol	1305	848	190	867	843	111	198			124		
tC, single (s)	7.1	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	6.1	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	88	99	88	88	54	100			82		
cM capacity (veh/h)	57	444	908	434	458	978	1375			1463		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	66	563	0	124	267	198
Volume Left	0	52	0	0	267	0
Volume Right	12	454	0	26	0	15
cSH	489	795	1700	1700	1463	1700
Volume to Capacity	0.13	0.71	0.00	0.07	0.18	0.12
Queue Length 95th (ft)	12	151	0	0	17	0
Control Delay (s)	13.5	19.7	0.0	0.0	8.0	0.0
Lane LOS	B	C			A	
Approach Delay (s)	13.5	19.7	0.0		4.6	
Approach LOS	B	C				

Intersection Summary				
Average Delay	11.6			
Intersection Capacity Utilization	64.8%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value

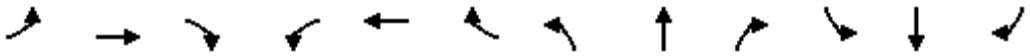


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	111	586	899	5	107	119
Future Volume (Veh/h)	111	586	899	5	107	119
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	637	977	5	116	129
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	982				1540	491
vC1, stage 1 conf vol					980	
vC2, stage 2 conf vol					560	
vCu, unblocked vol	982				1540	491
tC, single (s)	4.1				*5.0	*5.0
tC, 2 stage (s)					4.0	
tF (s)	2.2				3.5	3.3
p0 queue free %	83				73	81
cM capacity (veh/h)	699				427	682

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	121	318	318	651	331	116	129
Volume Left	121	0	0	0	0	116	0
Volume Right	0	0	0	0	5	0	129
cSH	699	1700	1700	1700	1700	427	682
Volume to Capacity	0.17	0.19	0.19	0.38	0.19	0.27	0.19
Queue Length 95th (ft)	16	0	0	0	0	27	17
Control Delay (s)	11.2	0.0	0.0	0.0	0.0	16.5	11.5
Lane LOS	B					C	B
Approach Delay (s)	1.8			0.0		13.9	
Approach LOS						B	

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

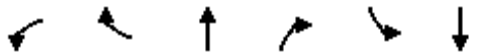


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	218	28	19	333	55	3	490	15	6	381	12
Future Volume (Veh/h)	6	218	28	19	333	55	3	490	15	6	381	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	237	30	21	362	60	3	533	16	7	414	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1214	990	420	1124	988	541	427			549		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1214	990	420	1124	988	541	427			549		
tC, single (s)	*4.2	*4.2	*4.2	*4.2	*4.2	*4.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	49	96	92	22	92	100			99		
cM capacity (veh/h)	137	462	801	259	463	733	1132			1021		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	267	21	422	3	549	7	427
Volume Left	7	0	21	0	3	0	7	0
Volume Right	0	30	0	60	0	16	0	13
cSH	137	485	259	488	1132	1700	1021	1700
Volume to Capacity	0.05	0.55	0.08	0.86	0.00	0.32	0.01	0.25
Queue Length 95th (ft)	4	82	7	228	0	0	1	0
Control Delay (s)	32.7	21.1	20.1	43.5	8.2	0.0	8.6	0.0
Lane LOS	D	C	C	E	A		A	
Approach Delay (s)	21.4		42.4		0.0		0.1	
Approach LOS	C		E					

Intersection Summary				
Average Delay	14.5			
Intersection Capacity Utilization	54.2%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	0	452	490	242	471
Future Volume (Veh/h)	15	0	452	490	242	471
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	491	533	263	512
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1529	491			1024	
vC1, stage 1 conf vol	491					
vC2, stage 2 conf vol	1038					
vCu, unblocked vol	1529	491			1024	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	100			61	
cM capacity (veh/h)	198	578			678	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	491	533	263	512
Volume Left	16	0	0	263	0
Volume Right	0	0	533	0	0
cSH	198	1700	1700	678	1700
Volume to Capacity	0.08	0.29	0.31	0.39	0.30
Queue Length 95th (ft)	7	0	0	46	0
Control Delay (s)	24.8	0.0	0.0	13.6	0.0
Lane LOS	C			B	
Approach Delay (s)	24.8	0.0		4.6	
Approach LOS	C				

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	50.5%	ICU Level of Service		A
Analysis Period (min)	15			

APPENDIX I-4

DORT HIGHWAY EXTENSION ALTERNATIVE C INTERSECTIONS ON MCWAIN ROAD WITH ROUNDABOUTS AT I-75 RAMPS

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	527	760	208
Demand Flow Rate, veh/h	0	537	775	212
Vehicles Circulating, veh/h	212	244	212	62
Vehicles Exiting, veh/h	62	743	0	719
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	10.7	10.6	5.3
Approach LOS	-	B	B	A

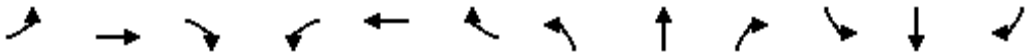
Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.115	0.885	0.315	0.685	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	62	475	244	531	212	0
Cap Entry Lane, veh/h	885	885	914	914	1062	1938
Entry HV Adj Factor	0.984	0.981	0.980	0.981	0.981	0.980
Flow Entry, veh/h	61	466	239	521	208	0
Cap Entry, veh/h	871	869	896	897	1042	1900
V/C Ratio	0.070	0.537	0.267	0.581	0.200	0.000
Control Delay, s/veh	4.8	11.5	6.8	12.3	5.3	0.0
LOS	A	B	A	B	A	A
95th %tile Queue, veh	0	3	1	4	1	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	277	152	66	539	146
Future Volume (Veh/h)	24	277	152	66	539	146
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	37	426	234	102	738	200
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1962	286			337	
vC1, stage 1 conf vol	286					
vC2, stage 2 conf vol	1676					
vCu, unblocked vol	1962	286			337	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	49			40	
cM capacity (veh/h)	124	829			1221	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	463	336	738	200
Volume Left	37	0	738	0
Volume Right	426	102	0	0
cSH	571	1700	1221	1700
Volume to Capacity	0.81	0.20	0.60	0.12
Queue Length 95th (ft)	202	0	107	0
Control Delay (s)	33.0	0.0	12.3	0.0
Lane LOS	D		B	
Approach Delay (s)	33.0	0.0	9.7	
Approach LOS	D			

Intersection Summary			
Average Delay	14.0		
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	770	0	1	389	26	3	11	8	114	1	46
Future Volume (Veh/h)	172	770	0	1	389	26	3	11	8	114	1	46
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	210	939	0	1	480	32	4	16	12	124	1	50
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	515			940			1654	1877	470	1410	1861	260
vC1, stage 1 conf vol							1360	1360		501	501	
vC2, stage 2 conf vol							294	517		910	1360	
vCu, unblocked vol	515			940			1654	1877	470	1410	1861	260
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)							4.0	4.0		4.0	4.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			100			99	94	98	68	100	94
cM capacity (veh/h)	1044			724			303	270	695	387	285	847

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	210	626	313	1	320	192	32	124	51
Volume Left	210	0	0	1	0	0	4	124	0
Volume Right	0	0	0	0	0	32	12	0	50
cSH	1044	1700	1700	724	1700	1700	357	387	815
Volume to Capacity	0.20	0.37	0.18	0.00	0.19	0.11	0.09	0.32	0.06
Queue Length 95th (ft)	19	0	0	0	0	0	7	34	5
Control Delay (s)	9.3	0.0	0.0	10.0	0.0	0.0	16.1	18.6	9.7
Lane LOS	A			A			C	C	A
Approach Delay (s)	1.7			0.0			16.1	16.0	
Approach LOS							C	C	

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	47.6%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	72	39	24	70	26	27	351	51	10	622	38
Future Volume (Veh/h)	108	72	39	24	70	26	27	351	51	10	622	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.86	0.86	0.83	0.83	0.92	0.60	0.92	0.60	0.92	0.92	0.92
Hourly flow rate (vph)	117	84	45	29	84	28	45	382	85	11	676	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1260	1276	696	1300	1254	424	717			467		
vC1, stage 1 conf vol	718	718		514	514							
vC2, stage 2 conf vol	542	557		785	739							
vCu, unblocked vol	1260	1276	696	1300	1254	424	717			467		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	82	92	93	82	96	95			99		
cM capacity (veh/h)	465	472	559	398	459	727	884			1094		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	129	29	112	45	467	11	717
Volume Left	117	0	29	0	45	0	11	0
Volume Right	0	45	0	28	0	85	0	41
cSH	465	499	398	506	884	1700	1094	1700
Volume to Capacity	0.25	0.26	0.07	0.22	0.05	0.27	0.01	0.42
Queue Length 95th (ft)	25	26	6	21	4	0	1	0
Control Delay (s)	15.3	14.7	14.8	14.1	9.3	0.0	8.3	0.0
Lane LOS	C	B	B	B	A		A	
Approach Delay (s)	15.0		14.3		0.8		0.1	
Approach LOS	C		B					

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Intersection	
Intersection Delay, s/veh	5.6
Intersection LOS	A

Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	75	705	1083	0
Demand Flow Rate, veh/h	76	720	1105	0
Vehicles Circulating, veh/h	387	354	76	387
Vehicles Exiting, veh/h	0	76	387	687
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	10.8	2.2	0.0
Approach LOS	A	B	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.538	0.463	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	76	0	387	333	354	751
Cap Entry Lane, veh/h	767	1938	793	793	1047	1938
Entry HV Adj Factor	0.987	0.980	0.980	0.979	0.980	0.980
Flow Entry, veh/h	75	0	379	326	347	736
Cap Entry, veh/h	757	1900	778	776	1027	1900
V/C Ratio	0.099	0.000	0.488	0.420	0.338	0.387
Control Delay, s/veh	5.8	0.0	11.4	10.1	7.0	0.0
LOS	A	A	B	B	A	A
95th %tile Queue, veh	0	0	3	2	2	2

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Approach	EB	NB	NE	SW
Entry Lanes	0	2	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	0	599	768	148
Demand Flow Rate, veh/h	0	611	784	151
Vehicles Circulating, veh/h	151	492	151	58
Vehicles Exiting, veh/h	58	443	0	1045
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	0.0	25.1	8.9	4.7
Approach LOS	-	D	A	A

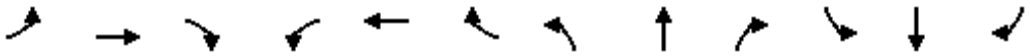
Lane	Left	Right	Left	Right	Left	Bypass
Designated Moves	L	TR	LT	R	L	R
Assumed Moves	L	TR	LT	R	L	R
RT Channelized						Free
Lane Util	0.095	0.905	0.628	0.372	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	58	553	492	292	151	0
Cap Entry Lane, veh/h	691	691	972	972	1066	1938
Entry HV Adj Factor	0.983	0.980	0.980	0.979	0.980	0.980
Flow Entry, veh/h	57	542	482	286	148	0
Cap Entry, veh/h	679	677	953	952	1045	1900
V/C Ratio	0.084	0.800	0.506	0.301	0.142	0.000
Control Delay, s/veh	6.2	27.1	10.1	6.9	4.7	0.0
LOS	A	D	B	A	A	A
95th %tile Queue, veh	0	8	3	1	0	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	67	451	110	58	262	230
Future Volume (Veh/h)	67	451	110	58	262	230
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	112	752	141	74	359	315
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1212	178			215	
vC1, stage 1 conf vol	178					
vC2, stage 2 conf vol	1034					
vCu, unblocked vol	1212	178			215	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	18			74	
cM capacity (veh/h)	365	919			1355	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	864	215	359	315
Volume Left	112	0	359	0
Volume Right	752	74	0	0
cSH	768	1700	1355	1700
Volume to Capacity	1.13	0.13	0.26	0.19
Queue Length 95th (ft)	625	0	27	0
Control Delay (s)	94.3	0.0	8.6	0.0
Lane LOS	F		A	
Approach Delay (s)	94.3	0.0	4.6	
Approach LOS	F			

Intersection Summary			
Average Delay	48.2		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	577	4	18	879	13	1	7	8	131	15	148
Future Volume (Veh/h)	142	577	4	18	879	13	1	7	8	131	15	148
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	149	607	4	23	1099	16	1	8	10	218	25	247
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1116			611			1762	2069	306	1770	2063	558
vC1, stage 1 conf vol							907	907		1154	1154	
vC2, stage 2 conf vol							855	1162		616	909	
vCu, unblocked vol	1116			611			1762	2069	306	1770	2063	558
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)							4.0	4.0		4.0	4.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	76			98			99	97	99	38	91	61
cM capacity (veh/h)	621			964			170	239	814	353	290	638

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	149	405	206	23	733	382	19	218	272
Volume Left	149	0	0	23	0	0	1	218	0
Volume Right	0	0	4	0	0	16	10	0	247
cSH	621	1700	1700	964	1700	1700	368	353	575
Volume to Capacity	0.24	0.24	0.12	0.02	0.43	0.22	0.05	0.62	0.47
Queue Length 95th (ft)	23	0	0	2	0	0	4	98	63
Control Delay (s)	12.6	0.0	0.0	8.8	0.0	0.0	15.3	30.3	16.8
Lane LOS	B			A			C	D	C
Approach Delay (s)	2.5			0.2			15.3	22.8	
Approach LOS							C	C	

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	56.5%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	187	49	62	290	55	25	490	46	6	381	12
Future Volume (Veh/h)	6	187	49	62	290	55	25	490	46	6	381	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.83	0.83	0.88	0.88	0.92	0.86	0.92	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	7	225	59	70	330	60	29	533	53	7	414	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1250	1078	420	1217	1058	560	427			586		
vC1, stage 1 conf vol	434	434		618	618							
vC2, stage 2 conf vol	816	644		600	441							
vCu, unblocked vol	1250	1078	420	1217	1058	560	427			586		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	57	92	81	37	91	97			99		
cM capacity (veh/h)	228	519	730	366	522	638	1132			989		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	284	70	390	29	586	7	427
Volume Left	7	0	70	0	29	0	7	0
Volume Right	0	59	0	60	0	53	0	13
cSH	228	552	366	537	1132	1700	989	1700
Volume to Capacity	0.03	0.51	0.19	0.73	0.03	0.34	0.01	0.25
Queue Length 95th (ft)	2	73	17	150	2	0	1	0
Control Delay (s)	21.3	18.2	17.1	27.5	8.3	0.0	8.7	0.0
Lane LOS	C	C	C	D	A		A	
Approach Delay (s)	18.3		25.9		0.4		0.1	
Approach LOS	C		D					

Intersection Summary				
Average Delay	9.8			
Intersection Capacity Utilization	60.5%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

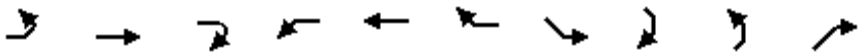
Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Approach	WB	NB	SB	NW
Entry Lanes	1	2	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	16	1024	775	0
Demand Flow Rate, veh/h	16	1045	790	0
Vehicles Circulating, veh/h	501	268	16	501
Vehicles Exiting, veh/h	0	16	501	812
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.5	13.6	1.9	0.0
Approach LOS	A	B	A	-

Lane	Left	Bypass	Left	Right	Left	Bypass
Designated Moves	L	R	LT	R	L	R
Assumed Moves	L	R	LT	R	L	R
RT Channelized		Free				Free
Lane Util	1.000		0.479	0.521	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	
Entry Flow, veh/h	16	0	501	544	268	522
Cap Entry Lane, veh/h	685	1938	864	864	1112	1938
Entry HV Adj Factor	1.000	0.980	0.980	0.980	0.981	0.980
Flow Entry, veh/h	16	0	491	533	263	512
Cap Entry, veh/h	685	1900	847	847	1091	1900
V/C Ratio	0.023	0.000	0.580	0.629	0.241	0.269
Control Delay, s/veh	5.5	0.0	12.8	14.3	5.5	0.0
LOS	A	A	B	B	A	A
95th %tile Queue, veh	0	0	4	5	1	1

APPENDIX I-5

DORT HIGHWAY EXTENSION ALTERNATIVE C INTERSECTIONS ON MCWAIN ROAD WITH STOP SIGNS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SER	NEL	NER
Lane Configurations										
Sign Control		Stop			Stop		Stop		Stop	
Traffic Volume (vph)	0	220	479	191	0	555	0	0	56	429
Future Volume (vph)	0	220	479	191	0	555	0	0	56	429
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	239	521	208	0	603	0	0	61	466

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NE 1	NE 2
Volume Total (vph)	239	521	208	603	61	466
Volume Left (vph)	0	0	208	0	0	0
Volume Right (vph)	0	521	0	603	0	466
Hadj (s)	0.03	-0.67	0.23	-0.57	0.03	-0.67
Departure Headway (s)	6.7	6.0	7.5	3.2	7.0	6.3
Degree Utilization, x	0.44	0.86	0.43	0.54	0.12	0.82
Capacity (veh/h)	524	590	452	1117	492	552
Control Delay (s)	13.7	34.3	16.0	9.8	9.8	30.7
Approach Delay (s)	27.9		11.4		28.3	
Approach LOS	D		B		D	

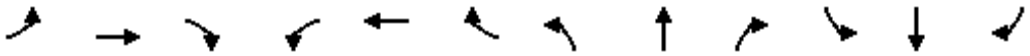
Intersection Summary				
Delay	21.6			
Level of Service	C			
Intersection Capacity Utilization	46.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	277	152	66	539	146
Future Volume (Veh/h)	24	277	152	66	539	146
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	37	426	234	102	738	200
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1962	286			337	
vC1, stage 1 conf vol	286					
vC2, stage 2 conf vol	1676					
vCu, unblocked vol	1962	286			337	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	49			40	
cM capacity (veh/h)	124	829			1221	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	463	336	738	200
Volume Left	37	0	738	0
Volume Right	426	102	0	0
cSH	571	1700	1221	1700
Volume to Capacity	0.81	0.20	0.60	0.12
Queue Length 95th (ft)	202	0	107	0
Control Delay (s)	33.0	0.0	12.3	0.0
Lane LOS	D		B	
Approach Delay (s)	33.0	0.0	9.7	
Approach LOS	D			

Intersection Summary			
Average Delay	14.0		
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	770	0	1	389	26	3	11	8	114	1	46
Future Volume (Veh/h)	172	770	0	1	389	26	3	11	8	114	1	46
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	210	939	0	1	480	32	4	16	12	124	1	50
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	515			940			1654	1877	470	1410	1861	260
vC1, stage 1 conf vol							1360	1360		501	501	
vC2, stage 2 conf vol							294	517		910	1360	
vCu, unblocked vol	515			940			1654	1877	470	1410	1861	260
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)							4.0	4.0		4.0	4.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			100			99	94	98	68	100	94
cM capacity (veh/h)	1044			724			303	270	695	387	285	847

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	210	626	313	1	320	192	32	124	51
Volume Left	210	0	0	1	0	0	4	124	0
Volume Right	0	0	0	0	0	32	12	0	50
cSH	1044	1700	1700	724	1700	1700	357	387	815
Volume to Capacity	0.20	0.37	0.18	0.00	0.19	0.11	0.09	0.32	0.06
Queue Length 95th (ft)	19	0	0	0	0	0	7	34	5
Control Delay (s)	9.3	0.0	0.0	10.0	0.0	0.0	16.1	18.6	9.7
Lane LOS	A			A			C	C	A
Approach Delay (s)	1.7			0.0			16.1	16.0	
Approach LOS							C	C	

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	47.6%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	72	39	24	70	26	27	351	51	10	622	38
Future Volume (Veh/h)	108	72	39	24	70	26	27	351	51	10	622	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.86	0.86	0.83	0.83	0.92	0.60	0.92	0.60	0.92	0.92	0.92
Hourly flow rate (vph)	117	84	45	29	84	28	45	382	85	11	676	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1260	1276	696	1300	1254	424	717			467		
vC1, stage 1 conf vol	718	718		514	514							
vC2, stage 2 conf vol	542	557		785	739							
vCu, unblocked vol	1260	1276	696	1300	1254	424	717			467		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	82	92	93	82	96	95			99		
cM capacity (veh/h)	465	472	559	398	459	727	884			1094		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	117	129	29	112	45	467	11	717
Volume Left	117	0	29	0	45	0	11	0
Volume Right	0	45	0	28	0	85	0	41
cSH	465	499	398	506	884	1700	1094	1700
Volume to Capacity	0.25	0.26	0.07	0.22	0.05	0.27	0.01	0.42
Queue Length 95th (ft)	25	26	6	21	4	0	1	0
Control Delay (s)	15.3	14.7	14.8	14.1	9.3	0.0	8.3	0.0
Lane LOS	C	B	B	B	A		A	
Approach Delay (s)	15.0		14.3		0.8		0.1	
Approach LOS	C		B					

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	69	0	349	300	319	677
Future Volume (Veh/h)	69	0	349	300	319	677
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	0	379	326	347	736
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1809	379			705	
vC1, stage 1 conf vol	379					
vC2, stage 2 conf vol	1430					
vCu, unblocked vol	1809	379			705	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	43	100			61	
cM capacity (veh/h)	131	668			893	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	75	379	326	347	736
Volume Left	75	0	0	347	0
Volume Right	0	0	326	0	0
cSH	131	1700	1700	893	1700
Volume to Capacity	0.57	0.22	0.19	0.39	0.43
Queue Length 95th (ft)	72	0	0	46	0
Control Delay (s)	64.5	0.0	0.0	11.6	0.0
Lane LOS	F			B	
Approach Delay (s)	64.5	0.0		3.7	
Approach LOS	F				

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	SEL	SER	NEL	NET	SWT	SWR	SWR2
Lane Configurations									
Sign Control	Stop		Stop			Stop	Stop		
Traffic Volume (vph)	443	263	0	0	52	499	136	0	350
Future Volume (vph)	443	263	0	0	52	499	136	0	350
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	482	286	0	0	57	542	148	0	380

Direction, Lane #	EB 1	EB 2	NE 1	NE 2	SW 1	SW 2
Volume Total (vph)	482	286	57	542	148	380
Volume Left (vph)	0	0	0	0	148	0
Volume Right (vph)	0	286	0	542	0	380
Hadj (s)	0.03	-0.67	0.03	-0.67	0.23	-0.57
Departure Headway (s)	6.8	6.1	7.0	6.3	7.8	3.2
Degree Utilization, x	0.91	0.49	0.11	0.95	0.32	0.34
Capacity (veh/h)	521	575	498	566	458	1113
Control Delay (s)	45.8	13.6	9.7	50.1	14.4	7.8
Approach Delay (s)	33.8		46.2		9.7	
Approach LOS	D		E		A	

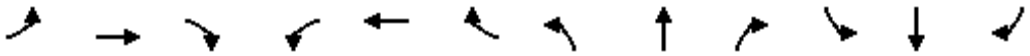
Intersection Summary				
Delay	31.0			
Level of Service	D			
Intersection Capacity Utilization	57.5%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	67	451	110	58	262	230
Future Volume (Veh/h)	67	451	110	58	262	230
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	112	752	141	74	359	315
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1212	178			215	
vC1, stage 1 conf vol	178					
vC2, stage 2 conf vol	1034					
vCu, unblocked vol	1212	178			215	
tC, single (s)	*5.0	*5.0			4.1	
tC, 2 stage (s)	4.0					
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	18			74	
cM capacity (veh/h)	365	919			1355	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	864	215	359	315
Volume Left	112	0	359	0
Volume Right	752	74	0	0
cSH	768	1700	1355	1700
Volume to Capacity	1.13	0.13	0.26	0.19
Queue Length 95th (ft)	625	0	27	0
Control Delay (s)	94.3	0.0	8.6	0.0
Lane LOS	F		A	
Approach Delay (s)	94.3	0.0	4.6	
Approach LOS	F			

Intersection Summary			
Average Delay	48.2		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

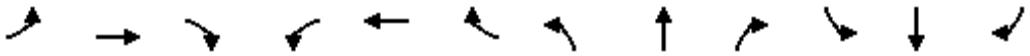


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	577	4	18	879	13	1	7	8	131	15	148
Future Volume (Veh/h)	142	577	4	18	879	13	1	7	8	131	15	148
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	149	607	4	23	1099	16	1	8	10	218	25	247
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1116			611			1762	2069	306	1770	2063	558
vC1, stage 1 conf vol							907	907		1154	1154	
vC2, stage 2 conf vol							855	1162		616	909	
vCu, unblocked vol	1116			611			1762	2069	306	1770	2063	558
tC, single (s)	4.1			4.1			*5.0	*5.0	*5.0	*5.0	*5.0	*5.0
tC, 2 stage (s)							4.0	4.0		4.0	4.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	76			98			99	97	99	38	91	61
cM capacity (veh/h)	621			964			170	239	814	353	290	638

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	149	405	206	23	733	382	19	218	272
Volume Left	149	0	0	23	0	0	1	218	0
Volume Right	0	0	4	0	0	16	10	0	247
cSH	621	1700	1700	964	1700	1700	368	353	575
Volume to Capacity	0.24	0.24	0.12	0.02	0.43	0.22	0.05	0.62	0.47
Queue Length 95th (ft)	23	0	0	2	0	0	4	98	63
Control Delay (s)	12.6	0.0	0.0	8.8	0.0	0.0	15.3	30.3	16.8
Lane LOS	B			A			C	D	C
Approach Delay (s)	2.5			0.2			15.3	22.8	
Approach LOS							C	C	

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	56.5%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

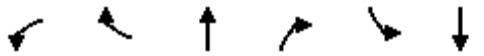


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	187	49	62	290	55	25	490	46	6	381	12
Future Volume (Veh/h)	6	187	49	62	290	55	25	490	46	6	381	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.83	0.83	0.88	0.88	0.92	0.86	0.92	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	7	225	59	70	330	60	29	533	53	7	414	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1250	1078	420	1217	1058	560	427			586		
vC1, stage 1 conf vol	434	434		618	618							
vC2, stage 2 conf vol	816	644		600	441							
vCu, unblocked vol	1250	1078	420	1217	1058	560	427			586		
tC, single (s)	*5.0	*5.0	*5.0	*5.0	*5.0	*5.0	4.1			4.1		
tC, 2 stage (s)	4.0	4.0		4.0	4.0							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	57	92	81	37	91	97			99		
cM capacity (veh/h)	228	519	730	366	522	638	1132			989		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	284	70	390	29	586	7	427
Volume Left	7	0	70	0	29	0	7	0
Volume Right	0	59	0	60	0	53	0	13
cSH	228	552	366	537	1132	1700	989	1700
Volume to Capacity	0.03	0.51	0.19	0.73	0.03	0.34	0.01	0.25
Queue Length 95th (ft)	2	73	17	150	2	0	1	0
Control Delay (s)	21.3	18.2	17.1	27.5	8.3	0.0	8.7	0.0
Lane LOS	C	C	C	D	A		A	
Approach Delay (s)	18.3		25.9		0.4		0.1	
Approach LOS	C		D					

Intersection Summary				
Average Delay	9.8			
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			

* User Entered Value



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	0	452	490	242	471
Future Volume (Veh/h)	15	0	452	490	242	471
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	491	533	263	512
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1796	758			1024	
vC1, stage 1 conf vol	758					
vC2, stage 2 conf vol	1038					
vCu, unblocked vol	1796	758			1024	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	100			61	
cM capacity (veh/h)	190	407			678	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	16	1024	263	512
Volume Left	16	0	263	0
Volume Right	0	533	0	0
cSH	190	1700	678	1700
Volume to Capacity	0.08	0.60	0.39	0.30
Queue Length 95th (ft)	7	0	46	0
Control Delay (s)	25.7	0.0	13.6	0.0
Lane LOS	D		B	
Approach Delay (s)	25.7	0.0	4.6	
Approach LOS	D			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

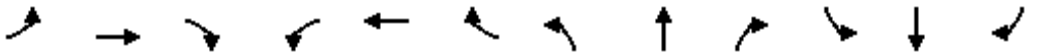
APPENDIX J

2040 NO-BUILD CAPACITY REPORT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	1	905	0	0	0	0	1183	143	120	856	0
Future Volume (vph)	319	1	905	0	0	0	0	1183	143	120	856	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frt	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1454	1504					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.11	1.00	
Satd. Flow (perm)	1681	1454	1504					3539	1583	196	3539	
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	404	1	1146	0	0	0	0	1460	177	148	1057	0
RTOR Reduction (vph)	0	63	95	0	0	0	0	0	107	0	0	0
Lane Group Flow (vph)	364	528	501	0	0	0	0	1460	70	148	1057	0
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	23.0	23.0	23.0					31.6	31.6	44.6	44.6	
Effective Green, g (s)	23.0	23.0	23.0					31.6	31.6	44.6	44.6	
Actuated g/C Ratio	0.29	0.29	0.29					0.40	0.40	0.56	0.56	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	483	418	432					1397	625	239	1972	
v/s Ratio Prot								c0.41		0.05	c0.30	
v/s Ratio Perm	0.22	0.36	0.33						0.04	0.29		
v/c Ratio	0.75	1.26	1.16					1.05	0.11	0.62	0.54	
Uniform Delay, d1	25.9	28.5	28.5					24.2	15.3	30.2	11.2	
Progression Factor	1.00	1.00	1.00					0.87	0.79	0.57	0.56	
Incremental Delay, d2	5.8	136.7	94.4					36.0	0.3	3.0	0.9	
Delay (s)	31.8	165.2	122.9					57.1	12.4	20.2	7.2	
Level of Service	C	F	F					E	B	C	A	
Approach Delay (s)		117.6			0.0			52.3			8.8	
Approach LOS		F			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	63.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	256	191	287	210	122	94	224	163	94	397	92
Future Volume (vph)	148	256	191	287	210	122	94	224	163	94	397	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3162		1703	3406	1524
Flt Permitted	0.55	1.00	1.00	0.46	1.00	1.00	0.44	1.00		0.41	1.00	1.00
Satd. Flow (perm)	1003	1827	1553	858	1863	1583	795	3162		731	3406	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.83	0.83	0.83	0.93	0.93	0.93
Adj. Flow (vph)	164	284	212	309	226	131	113	270	196	101	427	99
RTOR Reduction (vph)	0	0	153	0	0	89	0	139	0	0	0	72
Lane Group Flow (vph)	164	284	59	309	226	42	113	327	0	101	427	27
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	31.7	25.0	25.0	39.7	29.0	29.0	29.5	24.7		29.5	24.7	24.7
Effective Green, g (s)	31.7	25.0	25.0	39.7	29.0	29.0	29.5	24.7		29.5	24.7	24.7
Actuated g/C Ratio	0.35	0.28	0.28	0.44	0.32	0.32	0.33	0.27		0.33	0.27	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	407	507	431	486	600	510	309	867		291	934	418
v/s Ratio Prot	0.03	0.16		c0.08	0.12		c0.02	0.10		0.02	c0.13	
v/s Ratio Perm	0.11		0.04	c0.20		0.03	0.10			0.10		0.02
v/c Ratio	0.40	0.56	0.14	0.64	0.38	0.08	0.37	0.38		0.35	0.46	0.07
Uniform Delay, d1	24.2	27.8	24.4	24.7	23.5	21.2	25.5	26.4		26.1	27.1	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	4.4	0.7	2.7	1.8	0.3	0.7	1.3		0.7	1.6	0.3
Delay (s)	24.9	32.2	25.1	27.4	25.3	21.6	26.3	27.7		26.8	28.7	24.4
Level of Service	C	C	C	C	C	C	C	C		C	C	C
Approach Delay (s)		28.1			25.6			27.4			27.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	168	59	685	817	808	394
Future Volume (vph)	168	59	685	817	808	394
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3365	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3365	
Peak-hour factor, PHF	0.83	0.83	0.86	0.92	0.89	0.89
Adj. Flow (vph)	202	71	797	888	908	443
RTOR Reduction (vph)	0	61	0	262	67	0
Lane Group Flow (vph)	202	10	797	626	1284	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	11.3	11.3	56.4	56.4	56.4	
Effective Green, g (s)	11.3	11.3	56.4	56.4	56.4	
Actuated g/C Ratio	0.14	0.14	0.70	0.70	0.70	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	250	223	2494	1116	2372	
v/s Ratio Prot	c0.11	0.01	0.23		0.38	
v/s Ratio Perm				c0.40		
v/c Ratio	0.81	0.04	0.32	0.56	0.54	
Uniform Delay, d1	33.3	29.7	4.5	5.8	5.6	
Progression Factor	1.00	1.00	0.38	7.21	2.61	
Incremental Delay, d2	16.3	0.0	0.1	0.2	0.8	
Delay (s)	49.6	29.7	1.8	41.7	15.5	
Level of Service	D	C	A	D	B	
Approach Delay (s)			22.8		15.5	
Approach LOS			C		B	

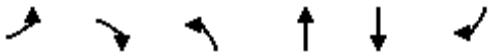
Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	312	259	72	52	250	390	38	433	34	186	358	93
Future Volume (vph)	312	259	72	52	250	390	38	433	34	186	358	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3423		1770	1863	1583	1770	3501		1770	3430	
Flt Permitted	0.45	1.00		0.48	1.00	1.00	0.45	1.00		0.39	1.00	
Satd. Flow (perm)	840	3423		899	1863	1583	844	3501		724	3430	
Peak-hour factor, PHF	0.84	0.84	0.84	0.87	0.87	0.87	0.72	0.72	0.72	0.85	0.85	0.85
Adj. Flow (vph)	371	308	86	60	287	448	53	601	47	219	421	109
RTOR Reduction (vph)	0	32	0	0	0	203	0	7	0	0	29	0
Lane Group Flow (vph)	371	362	0	60	287	245	53	641	0	219	501	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	22.0	22.0		22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)	22.0	22.0		22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio	0.28	0.28		0.28	0.28	0.28	0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	231	941		247	512	435	485	2013		416	1972	
v/s Ratio Prot		0.11			0.15			0.18			0.15	
v/s Ratio Perm	c0.44			0.07		0.15	0.06			c0.30		
v/c Ratio	1.61	0.38		0.24	0.56	0.56	0.11	0.32		0.53	0.25	
Uniform Delay, d1	29.0	23.5		22.5	24.9	24.9	7.7	8.8		10.4	8.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.28	1.45	
Incremental Delay, d2	292.0	0.3		0.5	1.4	1.7	0.5	0.4		3.7	0.2	
Delay (s)	321.0	23.8		23.0	26.3	26.6	8.2	9.3		16.9	12.5	
Level of Service	F	C		C	C	C	A	A		B	B	
Approach Delay (s)		167.9			26.2			9.2			13.8	
Approach LOS		F			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	55.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	152	139	39	704	921	89
Future Volume (vph)	152	139	39	704	921	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3492	
Flt Permitted	0.95	1.00	0.20	1.00	1.00	
Satd. Flow (perm)	1770	1583	380	3539	3492	
Peak-hour factor, PHF	0.73	0.73	0.82	0.82	0.94	0.94
Adj. Flow (vph)	208	190	48	859	980	95
RTOR Reduction (vph)	0	156	0	0	8	0
Lane Group Flow (vph)	208	34	48	859	1067	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	14.4	14.4	53.3	53.3	41.8	
Effective Green, g (s)	14.4	14.4	53.3	53.3	41.8	
Actuated g/C Ratio	0.18	0.18	0.67	0.67	0.52	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	318	284	343	2357	1824	
v/s Ratio Prot	c0.12		0.01	c0.24	c0.31	
v/s Ratio Perm		0.02	0.08			
v/c Ratio	0.65	0.12	0.14	0.36	0.59	
Uniform Delay, d1	30.5	27.5	9.9	5.9	13.1	
Progression Factor	1.00	1.00	0.27	0.25	0.69	
Incremental Delay, d2	4.8	0.2	0.2	0.4	1.3	
Delay (s)	35.3	27.7	2.8	1.9	10.4	
Level of Service	D	C	A	A	B	
Approach Delay (s)	31.6			2.0	10.4	
Approach LOS	C			A	B	

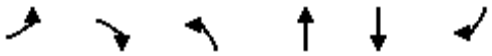
Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	163	40	674	182	24	847
Future Volume (vph)	163	40	674	182	24	847
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3426		1770	3539
Flt Permitted	0.95	1.00	1.00		0.22	1.00
Satd. Flow (perm)	1770	1583	3426		409	3539
Peak-hour factor, PHF	0.88	0.88	0.78	0.78	0.85	0.85
Adj. Flow (vph)	185	45	864	233	28	996
RTOR Reduction (vph)	0	37	22	0	0	0
Lane Group Flow (vph)	185	8	1075	0	28	996
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	13.6	13.6	40.0		54.5	54.5
Effective Green, g (s)	13.6	13.6	40.0		54.5	54.5
Actuated g/C Ratio	0.17	0.17	0.50		0.68	0.68
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	300	269	1713		339	2410
v/s Ratio Prot	c0.10		c0.31		0.00	c0.28
v/s Ratio Perm		0.00			0.05	
v/c Ratio	0.62	0.03	0.63		0.08	0.41
Uniform Delay, d1	30.8	27.7	14.6		7.4	5.7
Progression Factor	1.00	1.00	0.83		1.00	1.00
Incremental Delay, d2	3.7	0.0	1.7		0.1	0.5
Delay (s)	34.5	27.7	13.8		7.5	6.2
Level of Service	C	C	B		A	A
Approach Delay (s)	33.2		13.8			6.2
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

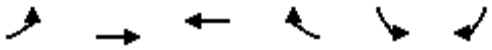
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	10	30	992	755	271
Future Volume (vph)	240	10	30	992	755	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3399	
Flt Permitted	0.95	1.00	0.09	1.00	1.00	
Satd. Flow (perm)	3433	1583	168	3539	3399	
Peak-hour factor, PHF	0.60	0.60	0.85	0.85	0.61	0.61
Adj. Flow (vph)	400	17	35	1167	1238	444
RTOR Reduction (vph)	0	14	0	0	36	0
Lane Group Flow (vph)	400	3	35	1167	1646	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	14.7	14.7	53.0	53.0	53.0	
Effective Green, g (s)	14.7	14.7	53.0	53.0	53.0	
Actuated g/C Ratio	0.18	0.18	0.66	0.66	0.66	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	630	290	111	2344	2251	
v/s Ratio Prot	c0.12			0.33	c0.48	
v/s Ratio Perm		0.00	0.21			
v/c Ratio	0.63	0.01	0.32	0.50	0.73	
Uniform Delay, d1	30.2	26.7	5.8	6.8	8.8	
Progression Factor	1.00	1.00	0.58	0.56	0.84	
Incremental Delay, d2	2.1	0.0	5.3	0.6	1.6	
Delay (s)	32.3	26.7	8.7	4.4	9.0	
Level of Service	C	C	A	A	A	
Approach Delay (s)	32.0			4.5	9.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

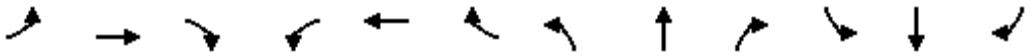
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	339	618	319	56	16	82
Future Volume (Veh/h)	339	618	319	56	16	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.67	0.67	0.60	0.60
Hourly flow rate (vph)	413	754	476	84	27	137
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						8
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	560				1680	239
vC1, stage 1 conf vol					476	
vC2, stage 2 conf vol					1204	
vCu, unblocked vol	560				1680	239
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	59				81	82
cM capacity (veh/h)	1007				140	761

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	413	377	377	238	238	84	164
Volume Left	413	0	0	0	0	0	27
Volume Right	0	0	0	0	0	84	137
cSH	1007	1700	1700	1700	1700	1700	848
Volume to Capacity	0.41	0.22	0.22	0.14	0.14	0.05	0.19
Queue Length 95th (ft)	51	0	0	0	0	0	18
Control Delay (s)	11.0	0.0	0.0	0.0	0.0	0.0	15.1
Lane LOS	B						C
Approach Delay (s)	3.9			0.0			15.1
Approach LOS							C

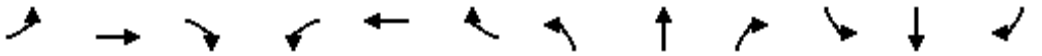
Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	0	36	1	1	0	111	970	2	8	644	113
Future Volume (Veh/h)	52	0	36	1	1	0	111	970	2	8	644	113
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.90	0.90	0.90	0.72	0.72	0.72
Hourly flow rate (vph)	87	0	60	2	2	0	123	1078	2	11	894	157
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1780	2320	526	1794	2398	540	1051			1080		
vC1, stage 1 conf vol	994	994		1325	1325							
vC2, stage 2 conf vol	786	1326		469	1073							
vCu, unblocked vol	1540	2187	38	1557	2279	540	667			1080		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	61	100	93	98	99	100	84			98		
cM capacity (veh/h)	224	158	856	133	145	486	767			641		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	147	4	123	719	361	11	596	455
Volume Left	87	2	123	0	0	11	0	0
Volume Right	60	0	0	0	2	0	0	157
cSH	379	139	767	1700	1700	641	1700	1700
Volume to Capacity	0.39	0.03	0.16	0.42	0.21	0.02	0.35	0.27
Queue Length 95th (ft)	45	2	14	0	0	1	0	0
Control Delay (s)	22.1	31.7	10.6	0.0	0.0	10.7	0.0	0.0
Lane LOS	C	D	B			B		
Approach Delay (s)	22.1	31.7	1.1			0.1		
Approach LOS	C	D						

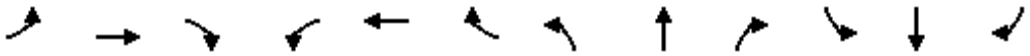
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	45.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	25	60	48	484	126	60	127	3	1	184	2
Future Volume (vph)	7	25	60	48	484	126	60	127	3	1	184	2
Peak Hour Factor	0.75	0.75	0.75	0.67	0.67	0.67	0.85	0.85	0.85	0.60	0.60	0.60
Hourly flow rate (vph)	9	33	80	72	722	188	71	149	4	2	307	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	122	982	224	309	3
Volume Left (vph)	9	72	71	2	0
Volume Right (vph)	80	188	4	0	3
Hadj (s)	-0.34	-0.07	0.09	0.04	-0.67
Departure Headway (s)	6.9	6.1	7.2	7.3	6.6
Degree Utilization, x	0.23	1.65	0.45	0.63	0.01
Capacity (veh/h)	479	588	475	481	528
Control Delay (s)	11.9	316.8	15.8	20.7	8.5
Approach Delay (s)	11.9	316.8	15.8	20.5	
Approach LOS	B	F	C	C	

Intersection Summary				
Delay	196.6			
Level of Service	F			
Intersection Capacity Utilization	72.8%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	2	27	2	128	15	1171	46	123	997	641
Future Volume (Veh/h)	27	0	2	27	2	128	15	1171	46	123	997	641
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.60	0.60	0.60	0.88	0.88	0.95	0.74	0.74	0.74	0.66	0.66	0.66
Hourly flow rate (vph)	45	0	3	31	2	135	20	1582	62	186	1511	971
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.90	0.90	0.81	0.90	0.90	0.83	0.81			0.83		
vC, conflicting volume	3336	4054	1242	2784	4508	822	2483			1644		
vC1, stage 1 conf vol	2370	2370		1653	1653							
vC2, stage 2 conf vol	967	1684		1130	2855							
vCu, unblocked vol	2517	3314	840	1902	3819	371	2365			1363		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	99	66	0	74	88			55		
cM capacity (veh/h)	18	4	251	90	2	519	165			414		

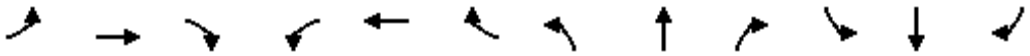
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	45	3	33	135	20	1055	589	186	1007	1475
Volume Left	45	0	31	0	20	0	0	186	0	0
Volume Right	0	3	0	135	0	0	62	0	0	971
cSH	18	251	21	519	165	1700	1700	414	1700	1700
Volume to Capacity	2.47	0.01	1.57	0.26	0.12	0.62	0.35	0.45	0.59	0.87
Queue Length 95th (ft)	153	1	109	26	10	0	0	57	0	0
Control Delay (s)	1105.0	19.5	672.7	14.4	29.8	0.0	0.0	20.6	0.0	0.0
Lane LOS	F	C	F	B	D			C		
Approach Delay (s)	1037.1		143.7		0.4			1.4		
Approach LOS	F		F							

Intersection Summary				
Average Delay	17.2			
Intersection Capacity Utilization	69.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	52	13	27	49	14
Future Volume (Veh/h)	29	52	13	27	49	14
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.65	0.65	0.73	0.73
Hourly flow rate (vph)	45	80	20	42	67	19
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	195	42			63	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	195	42			63	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	92			96	
cM capacity (veh/h)	758	1028			1538	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	125	62	86
Volume Left	45	0	67
Volume Right	80	42	0
cSH	911	1700	1538
Volume to Capacity	0.14	0.04	0.04
Queue Length 95th (ft)	12	0	3
Control Delay (s)	9.6	0.0	5.9
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	5.9
Approach LOS	A		

Intersection Summary			
Average Delay		6.2	
Intersection Capacity Utilization		21.6%	ICU Level of Service
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	924	0	1	408	3	3	10	8	6	1	27
Future Volume (Veh/h)	18	924	0	1	408	3	3	10	8	6	1	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	22	1127	0	1	504	4	4	14	12	7	1	29
Pedestrians		1						1			3	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	511			1128			1456	1685	564	1138	1683	258
vC1, stage 1 conf vol							1172	1172		511	511	
vC2, stage 2 conf vol							284	513		626	1172	
vCu, unblocked vol	511			1128			1456	1685	564	1138	1683	258
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	94	97	98	100	96
cM capacity (veh/h)	1047			614			191	236	468	332	236	738

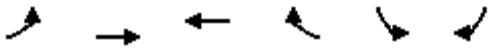
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	22	751	376	1	336	172	30	37
Volume Left	22	0	0	1	0	0	4	7
Volume Right	0	0	0	0	0	4	12	29
cSH	1047	1700	1700	614	1700	1700	283	572
Volume to Capacity	0.02	0.44	0.22	0.00	0.20	0.10	0.11	0.06
Queue Length 95th (ft)	2	0	0	0	0	0	9	5
Control Delay (s)	8.5	0.0	0.0	10.9	0.0	0.0	19.2	11.7
Lane LOS	A			B			C	B
Approach Delay (s)	0.2			0.0			19.2	11.7
Approach LOS							C	B

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	35.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	182	39	24	70	16	49
Future Volume (Veh/h)	182	39	24	70	16	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.83	0.83	0.60	0.60
Hourly flow rate (vph)	212	45	29	84	27	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			257		376	234
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			257		376	234
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	90
cM capacity (veh/h)			1308		611	805

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	257	113	109
Volume Left	0	29	27
Volume Right	45	0	82
cSH	1700	1308	746
Volume to Capacity	0.15	0.02	0.15
Queue Length 95th (ft)	0	2	13
Control Delay (s)	0.0	2.1	10.6
Lane LOS		A	B
Approach Delay (s)	0.0	2.1	10.6
Approach LOS			B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	93	138	60	48	70	34
Future Volume (Veh/h)	93	138	60	48	70	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.79	0.79	0.73	0.73	0.69	0.69
Hourly flow rate (vph)	118	175	82	66	101	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	148				526	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148				526	115
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				79	95
cM capacity (veh/h)	1434				470	937

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	293	148	150
Volume Left	118	0	101
Volume Right	0	66	49
cSH	1434	1700	562
Volume to Capacity	0.08	0.09	0.27
Queue Length 95th (ft)	7	0	27
Control Delay (s)	3.5	0.0	13.7
Lane LOS	A		B
Approach Delay (s)	3.5	0.0	13.7
Approach LOS			B

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	203	0	320	555
Future Volume (Veh/h)	0	0	203	0	320	555
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	221	0	348	603
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1520	221			221	
vC1, stage 1 conf vol	221					
vC2, stage 2 conf vol	1299					
vCu, unblocked vol	1520	221			221	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			74	
cM capacity (veh/h)	184	819			1348	

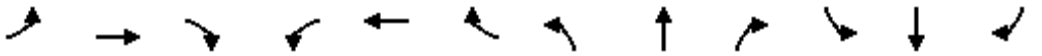
Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	221	348	603
Volume Left	0	348	0
Volume Right	0	0	0
cSH	1700	1348	1700
Volume to Capacity	0.13	0.26	0.35
Queue Length 95th (ft)	0	26	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	
Approach Delay (s)	0.0	3.1	
Approach LOS			

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	409	0	761	0	0	0	0	1737	142	64	680	0
Future Volume (vph)	409	0	761	0	0	0	0	1737	142	64	680	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	0.99					1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1442	1484					3539	1583	1770	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.10	1.00	
Satd. Flow (perm)	1681	1442	1484					3539	1583	177	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	435	0	810	0	0	0	0	2044	167	72	764	0
RTOR Reduction (vph)	0	135	135	0	0	0	0	0	71	0	0	0
Lane Group Flow (vph)	391	298	286	0	0	0	0	2044	96	72	764	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		3						1		2	5	
Permitted Phases	3		3						1	5		
Actuated Green, G (s)	20.3	20.3	20.3					35.6	35.6	47.3	47.3	
Effective Green, g (s)	20.3	20.3	20.3					35.6	35.6	47.3	47.3	
Actuated g/C Ratio	0.25	0.25	0.25					0.45	0.45	0.59	0.59	
Clearance Time (s)	6.0	6.0	6.0					6.4	6.4	6.4	6.4	
Vehicle Extension (s)	0.2	0.2	0.2					0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	426	365	376					1574	704	210	2092	
v/s Ratio Prot								c0.58		0.02	c0.22	
v/s Ratio Perm	c0.23	0.21	0.19						0.06	0.18		
v/c Ratio	0.92	0.82	0.76					1.30	0.14	0.34	0.37	
Uniform Delay, d1	29.0	28.1	27.6					22.2	13.1	31.1	8.5	
Progression Factor	1.00	1.00	1.00					0.88	0.95	0.48	0.42	
Incremental Delay, d2	24.0	12.5	7.9					137.9	0.3	0.3	0.4	
Delay (s)	53.0	40.6	35.5					157.4	12.8	15.2	4.0	
Level of Service	D	D	D					F	B	B	A	
Approach Delay (s)		42.8			0.0			146.5			5.0	
Approach LOS		D			A			F			A	

Intersection Summary			
HCM 2000 Control Delay	88.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	318	159	165	298	153	374	427	310	257	292	254
Future Volume (vph)	78	318	159	165	298	153	374	427	310	257	292	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1770	1863	1583	1703	3191		1703	3406	1524
Flt Permitted	0.40	1.00	1.00	0.36	1.00	1.00	0.56	1.00		0.17	1.00	1.00
Satd. Flow (perm)	731	1827	1553	673	1863	1583	1004	3191		310	3406	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	346	173	176	317	163	394	449	326	271	307	267
RTOR Reduction (vph)	0	0	125	0	0	114	0	148	0	0	0	198
Lane Group Flow (vph)	85	346	48	176	317	49	394	627	0	271	307	69
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	6%	6%	6%	6%	6%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		6
Actuated Green, G (s)	30.2	25.0	25.0	34.8	27.3	27.3	32.7	23.1		32.7	23.1	23.1
Effective Green, g (s)	30.2	25.0	25.0	34.8	27.3	27.3	32.7	23.1		32.7	23.1	23.1
Actuated g/C Ratio	0.34	0.28	0.28	0.39	0.30	0.30	0.36	0.26		0.36	0.26	0.26
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4		6.4	6.4	6.4
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2	3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	303	507	431	351	565	480	439	819		261	874	391
v/s Ratio Prot	0.02	c0.19		c0.04	0.17		0.10	0.20		c0.11	0.09	
v/s Ratio Perm	0.08		0.03	0.15		0.03	0.23			c0.27		0.04
v/c Ratio	0.28	0.68	0.11	0.50	0.56	0.10	0.90	0.77		1.04	0.35	0.18
Uniform Delay, d1	27.3	29.0	24.2	28.0	26.3	22.5	26.6	30.9		34.4	27.3	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	7.3	0.5	1.1	4.0	0.4	20.5	6.7		66.0	1.1	1.0
Delay (s)	27.8	36.2	24.7	29.1	30.3	23.0	47.1	37.7		100.4	28.4	27.0
Level of Service	C	D	C	C	C	C	D	D		F	C	C
Approach Delay (s)		31.8			28.2			40.9			51.1	
Approach LOS		C			C			D			D	

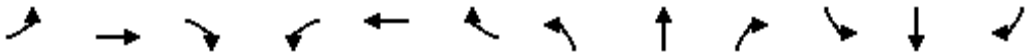
Intersection Summary			
HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR2	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	103	167	1016	1130	641	497
Future Volume (vph)	103	167	1016	1130	641	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	0.93	
Flt Protected	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	3307	
Flt Permitted	0.95	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	3307	
Peak-hour factor, PHF	0.78	0.78	0.89	0.92	0.90	0.90
Adj. Flow (vph)	132	214	1142	1228	712	552
RTOR Reduction (vph)	0	126	0	280	141	0
Lane Group Flow (vph)	132	88	1142	948	1123	0
Turn Type	Prot	Prot	NA	Perm	NA	
Protected Phases	3	3	5		1	
Permitted Phases				5		
Actuated Green, G (s)	8.2	8.2	59.5	59.5	59.5	
Effective Green, g (s)	8.2	8.2	59.5	59.5	59.5	
Actuated g/C Ratio	0.10	0.10	0.74	0.74	0.74	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	
Lane Grp Cap (vph)	181	162	2632	1177	2459	
v/s Ratio Prot	c0.07	0.06	0.32		0.34	
v/s Ratio Perm				c0.60		
v/c Ratio	0.73	0.55	0.43	0.81	0.46	
Uniform Delay, d1	34.8	34.1	3.9	6.6	4.0	
Progression Factor	1.00	1.00	0.07	9.71	4.89	
Incremental Delay, d2	11.7	2.0	0.0	0.6	0.4	
Delay (s)	46.6	36.1	0.3	64.2	19.9	
Level of Service	D	D	A	E	B	
Approach Delay (s)			33.4		19.9	
Approach LOS			C		B	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

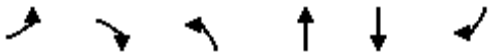
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	337	71	82	426	320	94	440	81	394	475	231
Future Volume (vph)	236	337	71	82	426	320	94	440	81	394	475	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3447		1770	1863	1583	1770	3457		1770	3366	
Flt Permitted	0.18	1.00		0.45	1.00	1.00	0.33	1.00		0.36	1.00	
Satd. Flow (perm)	339	3447		835	1863	1583	623	3457		680	3366	
Peak-hour factor, PHF	0.95	0.95	0.95	0.76	0.76	0.76	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	248	355	75	108	561	421	125	587	108	424	511	248
RTOR Reduction (vph)	0	22	0	0	0	210	0	19	0	0	31	0
Lane Group Flow (vph)	248	408	0	108	561	211	125	676	0	424	728	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	22.0	22.0		22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)	22.0	22.0		22.0	22.0	22.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio	0.28	0.28		0.28	0.28	0.28	0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	93	947		229	512	435	358	1987		391	1935	
v/s Ratio Prot		0.12			0.30			0.20			0.22	
v/s Ratio Perm	c0.73			0.13		0.13	0.20			c0.62		
v/c Ratio	2.67	0.43		0.47	1.10	0.49	0.35	0.34		1.08	0.38	
Uniform Delay, d1	29.0	23.8		24.2	29.0	24.3	9.0	9.0		17.0	9.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.29	1.42	
Incremental Delay, d2	779.8	0.3		1.5	68.4	0.9	2.7	0.5		67.8	0.5	
Delay (s)	808.8	24.2		25.7	97.4	25.1	11.7	9.4		89.6	13.6	
Level of Service	F	C		C	F	C	B	A		F	B	
Approach Delay (s)		311.2			62.4			9.8			40.9	
Approach LOS		F			E			A			D	

Intersection Summary			
HCM 2000 Control Delay	88.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



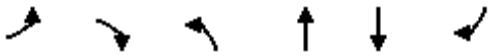
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	152	79	193	1239	1082	251
Future Volume (vph)	152	79	193	1239	1082	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1561	1770	3539	3439	
Flt Permitted	0.95	1.00	0.10	1.00	1.00	
Satd. Flow (perm)	1770	1561	184	3539	3439	
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.94	0.94
Adj. Flow (vph)	165	86	212	1362	1151	267
RTOR Reduction (vph)	0	72	0	0	22	0
Lane Group Flow (vph)	165	14	212	1362	1397	0
Confl. Peds. (#/hr)		1				
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.7	12.7	55.0	55.0	40.0	
Effective Green, g (s)	12.7	12.7	55.0	55.0	40.0	
Actuated g/C Ratio	0.16	0.16	0.69	0.69	0.50	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	
Lane Grp Cap (vph)	280	247	298	2433	1719	
v/s Ratio Prot	c0.09		c0.08	0.38	c0.41	
v/s Ratio Perm		0.01	0.41			
v/c Ratio	0.59	0.06	0.71	0.56	0.81	
Uniform Delay, d1	31.2	28.6	21.9	6.4	16.8	
Progression Factor	1.00	1.00	0.72	0.50	0.76	
Incremental Delay, d2	3.2	0.1	7.3	0.9	3.7	
Delay (s)	34.4	28.7	23.0	4.1	16.5	
Level of Service	C	C	C	A	B	
Approach Delay (s)	32.4			6.6	16.5	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	46	1238	153	51	1200
Future Volume (vph)	133	46	1238	153	51	1200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	10.9		5.9	5.9
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3481		1770	3539
Flt Permitted	0.95	1.00	1.00		0.10	1.00
Satd. Flow (perm)	1770	1583	3481		187	3539
Peak-hour factor, PHF	0.80	0.80	0.93	0.93	0.89	0.89
Adj. Flow (vph)	166	58	1331	165	57	1348
RTOR Reduction (vph)	0	49	9	0	0	0
Lane Group Flow (vph)	166	9	1487	0	57	1348
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.8	12.8	38.9		55.3	55.3
Effective Green, g (s)	12.8	12.8	38.9		55.3	55.3
Actuated g/C Ratio	0.16	0.16	0.49		0.69	0.69
Clearance Time (s)	6.0	6.0	10.9		5.9	5.9
Vehicle Extension (s)	3.0	3.0	0.2		3.0	0.2
Lane Grp Cap (vph)	283	253	1692		238	2446
v/s Ratio Prot	c0.09		c0.43		0.02	c0.38
v/s Ratio Perm		0.01			0.15	
v/c Ratio	0.59	0.04	0.88		0.24	0.55
Uniform Delay, d1	31.1	28.4	18.4		15.9	6.2
Progression Factor	1.00	1.00	0.89		1.00	1.00
Incremental Delay, d2	3.1	0.1	5.9		0.5	0.9
Delay (s)	34.2	28.5	22.3		16.4	7.1
Level of Service	C	C	C		B	A
Approach Delay (s)	32.7		22.3			7.4
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

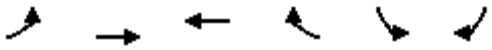
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	643	33	9	1136	967	246
Future Volume (vph)	643	33	9	1136	967	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3	6.3	6.3	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	3539	3431	
Flt Permitted	0.95	1.00	0.15	1.00	1.00	
Satd. Flow (perm)	3433	1583	279	3539	3431	
Peak-hour factor, PHF	0.83	0.83	0.77	0.77	0.94	0.94
Adj. Flow (vph)	775	40	12	1475	1029	262
RTOR Reduction (vph)	0	29	0	0	28	0
Lane Group Flow (vph)	775	11	12	1475	1263	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Actuated Green, G (s)	21.2	21.2	46.5	46.5	46.5	
Effective Green, g (s)	21.2	21.2	46.5	46.5	46.5	
Actuated g/C Ratio	0.26	0.26	0.58	0.58	0.58	
Clearance Time (s)	6.0	6.0	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	0.2	
Lane Grp Cap (vph)	909	419	162	2057	1994	
v/s Ratio Prot	c0.23			c0.42	0.37	
v/s Ratio Perm		0.01	0.04			
v/c Ratio	0.85	0.03	0.07	0.72	0.63	
Uniform Delay, d1	27.9	21.8	7.3	12.0	11.1	
Progression Factor	1.00	1.00	0.77	0.78	0.63	
Incremental Delay, d2	7.8	0.0	0.7	1.8	1.4	
Delay (s)	35.7	21.8	6.4	11.2	8.4	
Level of Service	D	C	A	B	A	
Approach Delay (s)	35.0			11.2	8.4	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

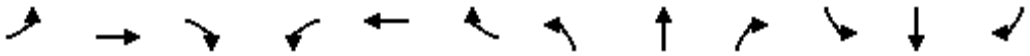
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	137	581	707	28	41	232
Future Volume (Veh/h)	137	581	707	28	41	232
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	146	618	744	29	46	261
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						8
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	773				1346	373
vC1, stage 1 conf vol					744	
vC2, stage 2 conf vol					602	
vCu, unblocked vol	773				1346	373
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	83				85	58
cM capacity (veh/h)	838				315	624

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	146	309	309	372	372	29	307
Volume Left	146	0	0	0	0	0	46
Volume Right	0	0	0	0	0	29	261
cSH	838	1700	1700	1700	1700	1700	734
Volume to Capacity	0.17	0.18	0.18	0.22	0.22	0.02	0.42
Queue Length 95th (ft)	16	0	0	0	0	0	52
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	0.0	15.4
Lane LOS	B						C
Approach Delay (s)	1.9			0.0			15.4
Approach LOS							C

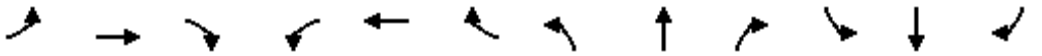
Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	0	67	5	0	21	103	1037	5	4	911	85
Future Volume (Veh/h)	87	0	67	5	0	21	103	1037	5	4	911	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.65	0.65	0.60	0.60	0.60	0.87	0.87	0.87	0.95	0.95	0.95
Hourly flow rate (vph)	134	0	103	8	0	35	118	1192	6	4	959	89
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)			8									
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								1000			1000	
pX, platoon unblocked	0.80	0.80	0.80	0.80	0.80		0.80					
vC, conflicting volume	1880	2446	524	1918	2487	600	1048			1198		
vC1, stage 1 conf vol	1012	1012		1431	1431							
vC2, stage 2 conf vol	868	1434		488	1056							
vCu, unblocked vol	1591	2303	0	1640	2355	600	545			1198		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	35	100	88	93	100	92	85			99		
cM capacity (veh/h)	207	150	862	116	142	444	811			578		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	237	43	118	795	403	4	639	409
Volume Left	134	8	118	0	0	4	0	0
Volume Right	103	35	0	0	6	0	0	89
cSH	365	291	811	1700	1700	578	1700	1700
Volume to Capacity	0.65	0.15	0.15	0.47	0.24	0.01	0.38	0.24
Queue Length 95th (ft)	109	13	13	0	0	1	0	0
Control Delay (s)	32.4	19.5	10.2	0.0	0.0	11.3	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	32.4	19.5	0.9			0.0		
Approach LOS	D	C						

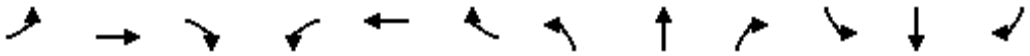
Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	55.1%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	92	253	62	139	52	17	47	29	20	66	4
Future Volume (vph)	2	92	253	62	139	52	17	47	29	20	66	4
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.93	0.93	0.93	0.86	0.86	0.86
Hourly flow rate (vph)	3	153	422	98	221	83	18	51	31	23	77	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	578	402	100	100	5
Volume Left (vph)	3	98	18	23	0
Volume Right (vph)	422	83	31	0	5
Hadj (s)	-0.40	-0.04	-0.12	0.15	-0.67
Departure Headway (s)	4.8	5.4	6.6	7.3	6.5
Degree Utilization, x	0.77	0.60	0.18	0.20	0.01
Capacity (veh/h)	724	644	477	442	494
Control Delay (s)	22.3	16.1	11.1	10.9	8.3
Approach Delay (s)	22.3	16.1	11.1	10.8	
Approach LOS	C	C	B	B	

Intersection Summary				
Delay	18.2			
Level of Service	C			
Intersection Capacity Utilization	56.4%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	5	45	40	1	80	15	1708	56	76	1128	237
Future Volume (Veh/h)	91	5	45	40	1	80	15	1708	56	76	1128	237
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.69	0.69	0.69	0.85	0.85	0.85	0.86	0.86	0.86
Hourly flow rate (vph)	125	7	62	58	1	116	18	2009	66	88	1312	276
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								574			317	
pX, platoon unblocked	0.75	0.75	0.89	0.75	0.75	0.70	0.89			0.70		
vC, conflicting volume	2784	3738	795	2976	3843	1038	1589			2075		
vC1, stage 1 conf vol	1627	1627		2078	2078							
vC2, stage 2 conf vol	1157	2111		898	1765							
vCu, unblocked vol	2061	3333	527	2317	3473	180	1417			1671		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	86	2	98	80	96			67		
cM capacity (veh/h)	75	7	442	59	58	579	424			265		

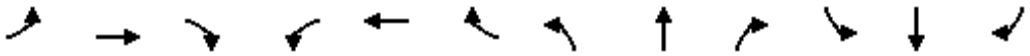
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	125	69	59	116	18	1339	736	88	875	713
Volume Left	125	0	58	0	18	0	0	88	0	0
Volume Right	0	62	0	116	0	0	66	0	0	276
cSH	75	58	59	579	424	1700	1700	265	1700	1700
Volume to Capacity	1.67	1.18	1.00	0.20	0.04	0.79	0.43	0.33	0.51	0.42
Queue Length 95th (ft)	267	145	117	19	3	0	0	35	0	0
Control Delay (s)	448.1	292.3	231.1	12.8	13.9	0.0	0.0	25.2	0.0	0.0
Lane LOS	F	F	F	B	B			D		
Approach Delay (s)	392.7		86.4		0.1			1.3		
Approach LOS	F		F							

Intersection Summary				
Average Delay	22.7			
Intersection Capacity Utilization	74.9%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	69	37	14	56	37
Future Volume (Veh/h)	64	69	37	14	56	37
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.78	0.78	0.73	0.73
Hourly flow rate (vph)	107	115	47	18	77	51
Pedestrians			1			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			3.5			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	262	56			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	262	56			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	89			95	
cM capacity (veh/h)	690	1011			1537	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	222	65	128
Volume Left	107	0	77
Volume Right	115	18	0
cSH	826	1700	1537
Volume to Capacity	0.27	0.04	0.05
Queue Length 95th (ft)	27	0	4
Control Delay (s)	11.0	0.0	4.6
Lane LOS	B		A
Approach Delay (s)	11.0	0.0	4.6
Approach LOS	B		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	716	5	16	918	8	1	5	5	20	20	58
Future Volume (Veh/h)	32	716	5	16	918	8	1	5	5	20	20	58
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.80	0.80	0.80	0.83	0.83	0.83	0.60	0.60	0.60
Hourly flow rate (vph)	34	754	5	20	1148	10	1	6	6	33	33	97
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1159			759			1552	2024	380	1648	2021	580
vC1, stage 1 conf vol							824	824		1194	1194	
vC2, stage 2 conf vol							728	1199		454	827	
vCu, unblocked vol	1159			759			1552	2024	380	1648	2021	580
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			98			99	97	99	82	84	79
cM capacity (veh/h)	598			848			182	187	618	180	203	457

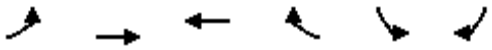
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	34	503	256	20	765	393	13	163
Volume Left	34	0	0	20	0	0	1	33
Volume Right	0	0	5	0	0	10	6	97
cSH	598	1700	1700	848	1700	1700	275	292
Volume to Capacity	0.06	0.30	0.15	0.02	0.45	0.23	0.05	0.56
Queue Length 95th (ft)	5	0	0	2	0	0	4	79
Control Delay (s)	11.4	0.0	0.0	9.3	0.0	0.0	18.8	31.8
Lane LOS	B			A			C	D
Approach Delay (s)	0.5			0.2			18.8	31.8
Approach LOS							C	D

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	43.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	187	31	62	290	41	65
Future Volume (Veh/h)	187	31	62	290	41	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.86	0.86
Hourly flow rate (vph)	225	37	70	330	48	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			262		714	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			262		714	244
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		87	90
cM capacity (veh/h)			1302		377	795

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	262	400	124
Volume Left	0	70	48
Volume Right	37	0	76
cSH	1700	1302	556
Volume to Capacity	0.15	0.05	0.22
Queue Length 95th (ft)	0	4	21
Control Delay (s)	0.0	1.8	13.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.8	13.3
Approach LOS			B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	115	137	212	112	95	140
Future Volume (Veh/h)	115	137	212	112	95	140
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.82	0.82	0.88	0.88
Hourly flow rate (vph)	129	154	259	137	108	159
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	396				740	328
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396				740	328
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				68	78
cM capacity (veh/h)	1163				342	714

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	283	396	267
Volume Left	129	0	108
Volume Right	0	137	159
cSH	1163	1700	496
Volume to Capacity	0.11	0.23	0.54
Queue Length 95th (ft)	9	0	79
Control Delay (s)	4.4	0.0	20.4
Lane LOS	A		C
Approach Delay (s)	4.4	0.0	20.4
Approach LOS			C

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	426	0	252	364
Future Volume (Veh/h)	0	0	426	0	252	364
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	463	0	274	396
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1407	463			463	
vC1, stage 1 conf vol	463					
vC2, stage 2 conf vol	944					
vCu, unblocked vol	1407	463			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			75	
cM capacity (veh/h)	265	599			1098	

Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	463	274	396
Volume Left	0	274	0
Volume Right	0	0	0
cSH	1700	1098	1700
Volume to Capacity	0.27	0.25	0.23
Queue Length 95th (ft)	0	25	0
Control Delay (s)	0.0	9.4	0.0
Lane LOS		A	
Approach Delay (s)	0.0	3.8	
Approach LOS			

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	71.5%	ICU Level of Service		C
Analysis Period (min)	15			

APPENDIX K

EXISTING CONDITIONS VALIDATION REPORT

1002: Holly Rd & SB I-75 Off Ramp/SB I-75 On Ramp Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	287	39	650	974	103	99	558	2710
Vehicles Exited	287	39	650	972	103	99	558	2708
Hourly Exit Rate	287	39	650	972	103	99	558	2708
Input Volume	282	42	642	1028	112	99	562	2766
% of Volume	102	92	101	95	92	100	99	98

1003: M-54 (Dort Hwy) & Grand Blanc Rd/Grand Blanc Rd (Pushbuttons) Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	152	253	194	282	208	123	81	244	126	74	254	77
Vehicles Exited	152	253	195	281	208	123	81	244	126	76	254	78
Hourly Exit Rate	152	253	195	281	208	123	81	244	126	76	254	78
Input Volume	148	256	191	287	210	122	78	237	135	78	245	76
% of Volume	103	99	102	98	99	101	104	103	93	97	104	103

1003: M-54 (Dort Hwy) & Grand Blanc Rd/Grand Blanc Rd (Pushbuttons) Performance by movement

Movement	All
Vehicles Entered	2068
Vehicles Exited	2071
Hourly Exit Rate	2071
Input Volume	2064
% of Volume	100

1102: Holly Rd & NB I-75 Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	122	6	54	595	656	526	326	2285
Vehicles Exited	123	6	54	580	656	524	326	2269
Hourly Exit Rate	123	6	54	580	656	524	326	2269
Input Volume	123	5	52	651	679	529	325	2365
% of Volume	100	114	104	89	97	99	100	96

1156: Holly Rd & Baldwin Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	229	204	57	41	165	274	31	322	26	151	293	72
Vehicles Exited	230	204	56	41	165	275	30	322	26	152	293	72
Hourly Exit Rate	230	204	56	41	165	275	30	322	26	152	293	72
Input Volume	231	210	53	41	166	277	29	321	28	147	296	75
% of Volume	100	97	105	100	99	99	104	100	94	104	99	96

1156: Holly Rd & Baldwin Rd Performance by movement

Movement	All
Vehicles Entered	1865
Vehicles Exited	1866
Hourly Exit Rate	1866
Input Volume	1873
% of Volume	100

1197: Holly Rd & E Cook Rd Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	132	17	116	31	647	684	67	1694
Vehicles Exited	133	17	117	32	647	685	68	1699
Hourly Exit Rate	133	17	117	32	647	685	68	1699
Input Volume	133	18	122	32	666	682	66	1720
% of Volume	100	94	96	99	97	100	103	99

1297: Holly Rd & E Cook Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	143	38	626	142	19	589	1557
Vehicles Exited	143	38	628	143	19	589	1560
Hourly Exit Rate	143	38	628	143	19	589	1560
Input Volume	144	40	640	145	20	585	1574
% of Volume	99	96	98	99	94	101	99

1323: Holly Rd & Genesys Pkwy Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	233	18	2	17	792	615	194	1871
Vehicles Exited	235	17	2	17	792	615	195	1873
Hourly Exit Rate	235	17	2	17	792	615	195	1873
Input Volume	231	20	2	15	803	609	198	1878
% of Volume	102	87	89	113	99	101	98	100

9004: SB I-75 Off Ramp & SB I-75 On Ramp Performance by movement

Movement	NET	SWR	All
Vehicles Entered	181	467	648
Vehicles Exited	182	467	649
Hourly Exit Rate	182	467	649
Input Volume	180	459	640
% of Volume	101	102	101

9010: Baldwin Rd & Health Park Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	141	456	266	24	10	54	951
Vehicles Exited	141	459	266	24	10	55	955
Hourly Exit Rate	141	459	266	24	10	55	955
Input Volume	144	457	272	25	10	52	959
% of Volume	98	100	98	96	98	106	100

9015: Halsey Rd & Baldwin Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	477	8	3	271	1	21	781
Vehicles Exited	477	8	3	272	1	21	782
Hourly Exit Rate	477	8	3	272	1	21	782
Input Volume	478	7	4	274	2	22	787
% of Volume	100	114	75	99	44	97	99

9025: Holly Rd & Woodridge Blvd/Business Drive Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	39	4	26	1	2	47	768	2	6	556	64	1515
Vehicles Exited	40	4	26	1	2	47	768	2	6	555	64	1515
Hourly Exit Rate	40	4	26	1	2	47	768	2	6	555	64	1515
Input Volume	41	3	28	1	1	50	775	2	7	549	64	1522
% of Volume	98	133	92	80	160	94	99	100	86	101	100	100

9040: Health Park Blvd/Business Dr & Pollock Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Vehicles Entered	3	9	16	38	253	55	25	116	1	190	3	709
Vehicles Exited	3	9	17	38	253	55	25	116	1	190	3	710
Hourly Exit Rate	3	9	17	38	253	55	25	116	1	190	3	710
Input Volume	3	8	16	40	251	54	24	117	1	184	2	701
% of Volume	92	106	108	96	101	102	103	99	80	103	133	101

9045: Holly Rd & Pollock Rd/Commercial Drive Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	6	1	2	25	3	103	8	988	40	107	832	333
Vehicles Exited	5	1	2	25	3	84	8	986	39	108	831	334
Hourly Exit Rate	5	1	2	25	3	84	8	986	39	108	831	334
Input Volume	7	1	1	27	2	128	8	998	38	102	830	334
% of Volume	74	133	160	92	150	65	100	99	102	106	100	100

9045: Holly Rd & Pollock Rd/Commercial Drive Performance by movement

Movement	All
Vehicles Entered	2448
Vehicles Exited	2426
Hourly Exit Rate	2426
Input Volume	2476
% of Volume	98

9050: McWain Rd & Pollock Rd Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	6	3	14	6	8	23	5	65
Vehicles Exited	6	3	15	6	8	23	5	66
Hourly Exit Rate	6	3	15	6	8	23	5	66
Input Volume	6	2	16	6	8	22	4	64
% of Volume	100	133	94	104	97	106	125	103

9052: McWain Rd & Baldwin Rd Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	4	586	1	314	2	2	7	6	2	2	7	933
Vehicles Exited	4	589	1	316	2	2	7	6	2	2	7	938
Hourly Exit Rate	4	589	1	316	2	2	7	6	2	2	7	938
Input Volume	4	592	1	314	1	3	8	6	2	2	6	940
% of Volume	94	99	100	100	200	62	85	100	100	114	112	100

9055: McWain Rd & E Cook Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	174	17	10	78	6	14	299
Vehicles Exited	174	17	10	78	6	14	299
Hourly Exit Rate	174	17	10	78	6	14	299
Input Volume	180	15	10	74	6	15	300
% of Volume	97	115	103	105	96	92	100

9060: E Cook Rd & Embury Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	77	116	60	48	52	31	384
Vehicles Exited	77	116	60	48	52	31	384
Hourly Exit Rate	77	116	60	48	52	31	384
Input Volume	79	119	59	48	56	29	390
% of Volume	97	97	102	100	92	106	98

9080: NB I-75 On Ramp & M-54 (Dort Hwy) Performance by movement

Movement	NBT	SBL	SBT	All
Vehicles Entered	182	262	467	911
Vehicles Exited	182	262	467	911
Hourly Exit Rate	182	262	467	911
Input Volume	180	264	459	903
% of Volume	101	99	102	101

9085: M-54 (Dort Hwy) & NB I-75 Exit Ramp Performance by movement

Movement	NBT	SBT	NWR	All
Vehicles Entered	182	744	245	1171
Vehicles Exited	182	744	244	1170
Hourly Exit Rate	182	744	244	1170
Input Volume	180	736	246	1162
% of Volume	101	101	99	101

Total Zone Performance

Vehicles Entered	5022
Vehicles Exited	559
Hourly Exit Rate	559
Input Volume	25085
% of Volume	2

1002: Holly Rd & SB I-75 Off Ramp/SB I-75 On Ramp Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	357	5	551	1114	90	54	470	2641
Vehicles Exited	355	5	554	1110	90	54	470	2638
Hourly Exit Rate	355	5	554	1110	90	54	470	2638
Input Volume	351	6	552	1205	94	51	469	2727
% of Volume	101	91	100	92	96	106	100	97

1003: M-54 (Dort Hwy) & Grand Blanc Rd/Grand Blanc Rd (Pushbuttons) Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	73	321	160	164	297	158	289	434	239	198	165	201
Vehicles Exited	73	322	160	165	297	158	289	433	239	197	164	200
Hourly Exit Rate	73	322	160	165	297	158	289	433	239	197	164	200
Input Volume	78	318	159	165	298	153	297	450	246	204	165	202
% of Volume	93	101	101	100	100	103	97	96	97	97	99	99

1003: M-54 (Dort Hwy) & Grand Blanc Rd/Grand Blanc Rd (Pushbuttons) Performance by movement

Movement	All
Vehicles Entered	2699
Vehicles Exited	2697
Hourly Exit Rate	2697
Input Volume	2735
% of Volume	99

1102: Holly Rd & NB I-75 Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	78	11	142	704	761	451	405	2552
Vehicles Exited	78	11	143	690	762	452	405	2541
Hourly Exit Rate	78	11	143	690	762	452	405	2541
Input Volume	76	10	143	782	790	448	395	2644
% of Volume	103	105	100	88	96	101	103	96

1156: Holly Rd & Baldwin Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	141	222	43	62	290	218	63	316	62	272	346	151
Vehicles Exited	139	220	43	61	292	220	63	316	62	274	347	151
Hourly Exit Rate	139	220	43	61	292	220	63	316	62	274	347	151
Input Volume	148	220	46	61	281	217	66	317	64	281	346	157
% of Volume	94	100	94	100	104	101	95	100	97	98	100	96

1156: Holly Rd & Baldwin Rd Performance by movement

Movement	All
Vehicles Entered	2186
Vehicles Exited	2188
Hourly Exit Rate	2188
Input Volume	2204
% of Volume	99

1197: Holly Rd & E Cook Rd Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	138	81	130	875	825	196	2245
Vehicles Exited	137	81	130	876	825	196	2245
Hourly Exit Rate	137	81	130	876	825	196	2245
Input Volume	136	73	138	891	816	185	2239
% of Volume	101	111	94	98	101	106	100

1297: Holly Rd & E Cook Rd Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	120	47	898	118	42	881	2106
Vehicles Exited	120	47	901	118	42	882	2110
Hourly Exit Rate	120	47	901	118	42	882	2110
Input Volume	121	46	918	111	40	862	2097
% of Volume	99	102	98	107	106	102	101

1323: Holly Rd & Genesys Pkwy Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	470	43	26	5	750	753	158	2205
Vehicles Exited	464	43	26	5	747	754	158	2197
Hourly Exit Rate	464	43	26	5	747	754	158	2197
Input Volume	476	44	24	7	760	766	155	2232
% of Volume	97	97	109	74	98	98	102	98

9004: SB I-75 Off Ramp & SB I-75 On Ramp Performance by movement

Movement	NET	SWR	All
Vehicles Entered	362	290	652
Vehicles Exited	360	290	650
Hourly Exit Rate	360	290	650
Input Volume	366	289	655
% of Volume	98	100	99

9010: Baldwin Rd & Health Park Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBT	SBR	All
Vehicles Entered	64	371	488	11	22	15	128	1099
Vehicles Exited	66	373	489	11	22	15	127	1103
Hourly Exit Rate	66	373	489	11	22	15	127	1103
Input Volume	64	379	483	12	23	14	127	1102
% of Volume	103	98	101	90	96	109	100	100

9015: Halsey Rd & Baldwin Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Vehicles Entered	391	7	13	513	16	940
Vehicles Exited	391	7	13	514	16	941
Hourly Exit Rate	391	7	13	514	16	941
Input Volume	396	8	14	510	18	946
% of Volume	99	85	91	101	90	99

9025: Holly Rd & Woodridge Blvd/Business Drive Performance by movement

Movement	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Vehicles Entered	56	2	35	4	9	53	680	4	3	704	50	1600
Vehicles Exited	57	2	35	4	9	54	681	4	3	704	50	1603
Hourly Exit Rate	57	2	35	4	9	54	681	4	3	704	50	1603
Input Volume	59	2	34	5	8	55	690	4	3	714	50	1623
% of Volume	97	133	103	80	116	99	99	94	100	99	100	99

9040: Health Park Blvd/Business Dr & Pollock Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	2	57	83	46	80	19	10	10	20	20	66	4
Vehicles Exited	2	56	81	46	81	19	9	10	20	20	64	4
Hourly Exit Rate	2	56	81	46	81	19	9	10	20	20	64	4
Input Volume	2	54	76	47	88	17	9	10	21	20	66	4
% of Volume	89	104	107	97	92	110	97	100	96	100	97	94

9040: Health Park Blvd/Business Dr & Pollock Rd Performance by movement

Movement	All
Vehicles Entered	417
Vehicles Exited	412
Hourly Exit Rate	412
Input Volume	414
% of Volume	99

9045: Holly Rd & Pollock Rd/Commercial Drive Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	48	5	25	31	1	66	9	1164	42	63	855	121
Vehicles Exited	18	3	13	32	1	50	9	1153	41	62	856	121
Hourly Exit Rate	18	3	13	32	1	50	9	1153	41	62	856	121
Input Volume	49	5	25	40	1	80	9	1188	44	61	848	128
% of Volume	37	57	52	80	100	62	103	97	94	101	101	95

9045: Holly Rd & Pollock Rd/Commercial Drive Performance by movement

Movement	All
Vehicles Entered	2430
Vehicles Exited	2359
Hourly Exit Rate	2359
Input Volume	2478
% of Volume	95

9050: McWain Rd & Pollock Rd Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	10	6	33	20	5	19	23	116
Vehicles Exited	10	6	34	20	5	19	23	117
Hourly Exit Rate	10	6	34	20	5	19	23	117
Input Volume	9	6	33	19	3	18	20	109
% of Volume	111	100	102	104	154	104	116	108

9052: McWain Rd & Baldwin Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	16	424	5	9	626	4	0	5	6	4	14	15
Vehicles Exited	16	425	5	9	627	4	0	5	6	4	14	15
Hourly Exit Rate	16	425	5	9	627	4	0	5	6	4	14	15
Input Volume	13	433	4	10	619	4	1	4	5	4	12	13
% of Volume	121	98	125	90	101	94	0	118	114	100	117	115

9052: McWain Rd & Baldwin Rd Performance by movement

Movement	All
Vehicles Entered	1128
Vehicles Exited	1130
Hourly Exit Rate	1130
Input Volume	1123
% of Volume	101

9055: McWain Rd & E Cook Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Vehicles Entered	191	13	26	299	20	5	32	586
Vehicles Exited	191	13	26	300	20	5	32	587
Hourly Exit Rate	191	13	26	300	20	5	32	587
Input Volume	187	12	24	294	20	5	31	572
% of Volume	102	111	108	102	100	105	104	103

9060: E Cook Rd & Embury Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	98	130	206	92	94	126	746
Vehicles Exited	98	130	206	93	94	126	747
Hourly Exit Rate	98	130	206	93	94	126	747
Input Volume	99	123	203	93	91	122	730
% of Volume	99	106	102	100	103	104	102

9080: NB I-75 On Ramp & M-54 (Dort Hwy) Performance by movement

Movement	NBT	SBL	SBT	All
Vehicles Entered	360	202	290	852
Vehicles Exited	361	202	290	853
Hourly Exit Rate	361	202	290	853
Input Volume	366	200	290	855
% of Volume	99	101	100	100

9085: M-54 (Dort Hwy) & NB I-75 Exit Ramp Performance by movement

Movement	NBT	SBT	NWR	All
Vehicles Entered	361	500	564	1425
Vehicles Exited	359	502	563	1424
Hourly Exit Rate	359	502	563	1424
Input Volume	366	498	588	1452
% of Volume	98	101	96	98

Total Zone Performance

Vehicles Entered	5336
Vehicles Exited	425
Hourly Exit Rate	425
Input Volume	28939
% of Volume	1

APPENDIX L

PUBLIC INFORMATION WORKSHOP COMMENTS

Dort Highway Extension
Public Questions & Comments Matrix

No.	Topic	Type	Format	Name (if provided)	Address (if provided)	Email Address (if provided)	Question Asked or Comment Submitted	Response
1	Access	Question	Verbal (Workshop)	NA	NA	NA	Has adding a right turn lane to Holly road at the North end of the bridge been considered? This would allow traffic to I-75 North to turn without waiting for the light.	The secondary effects of the Dort Extension will reduce the congestion at this location.
2	Access	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Lindsay Ln. must remain dead-end.	Comment noted.
3	Access	Comment	Written (Comment Form)	Erin Janetsky	9035 Creekview Ct.	NA	A roundabout is needed at Embury and Grand Blanc Rd.	Comment noted.
4	Access	Comment	Written (Comment Form)	Sue Hulett	4187 Crestknoll Dr.	NA	No roundabouts, please! No matter which route is taken. Have never seen one that works up to its ideal or plan.	Comment noted.
5	Access	Comment	Written (Comment Form)	Jan Edward Hulett	4187 Crestknoll Dr.	NA	North end of Holly Rd./I-75 bridge (see illustration). Add new right turn lane to Holly Road north end of bridge to allow south bound traffic to turn right without having to wait for 2 lanes of south bound traffic to go through after the light turns green. This right turn lane would start at south end of gas station on west side of Holly Road. New dedicated right-hand lane on southbound Holly Road to northbound I-75. Spoke to Ken Johnson, Safety Engineer on June 30, 2016. Add right turn lane at north end of bridge by gas station.	Comment noted.
6	Acquisition	Question	Verbal (Workshop)	NA	NA	NA	Can houses be moved instead of demolished?	This will need to be weighed against the cost of outright acquisition. There are strict federal acquisition guidelines that must be followed for dislocations due to property takes.
7	Acquisition	Question	Verbal (Workshop)	NA	NA	NA	How will reduced home values be handled?	It is not anticipated that home values will be decreased adjacent to the proposed route at this time.
8	Acquisition	Question	Verbal (Workshop)	NA	NA	NA	Is the county ready to buy all of the affected homes?	GCRC will be looking at this option with the funding available but waiting for the final determination of effected properties and costs.
9	Acquisition	Question	Written (Comment Form)	Scott Bennett	2067 Larkspur Ln.	NA	Can we move any houses? As opposed to demolition?	No property acquisition along Larkspur Lane is anticipated to be included with this project.
10	Alignment	Question	Verbal (Workshop)	NA	NA	NA	Is there an actual need for this extension?	Based upon the existing traffic volumes and the projected growth/expantion of buisiness/commercial/residential within this area, additional capacity will be necessary in the very near future in order to maintain an adequate level of service without user delay.
11	Alignment	Question	Verbal (Workshop)	NA	NA	NA	Could an interchange at Health Park Blvd. be explored?	Utilizing the existing interchange at Dort Highway and I-75 to it's fullest potential vs. the development of a new interchange at another location along I-75 was the direction that made the most sense from an environmental and economic view.
12	Alignment	Question	Verbal (Workshop)	NA	NA	NA	Has an interchange at Baldwin Rd. along with an improved interchange at Holly Rd. been considered?	Improvements to the Holly Road interchange are currently under deisgn by MDOT. An interchange at Baldwin Road was a consideration, but its location in relation to the Holly Road interchange may be too close to develop the proper ramps for a Baldwin Road Interchange.

13	Alignment	Question	Verbal (Workshop)	NA	NA	NA	Has rerouting the off-ramp from SB I-75 from Holly Rd. to Pollock Rd. and then relocating the traffic signal at the end of the ramp to the Pollock Rd. and Holly Rd. intersection been considered?	Yes. Several alternatives to alleviate congestion and improve safety have already been completed by the GCRC and MDOT at this location. The extension of South Dort Highway will also help improve safety by diverting some of the traffic from the Holly Road interchange.
14	Alignment	Question	Verbal (Workshop)	NA	NA	NA	Pollock Rd. and McWain Rd. have been neglected for a long time. Why would anyone believe that sufficient attention would be made in the future?	Improvements to local roadways are a joint effort between the Townships and the GCRC, and are dependent on the amount of funding available to properly complete these upgrades. South Dort Highway extended would be a federal-aid elegible roadway and not subject to the same fiscal constraints that the local roadways are.
15	Alignment	Question	Verbal (Workshop)	NA	NA	NA	The McWain Rd. option reduces the size of the front yards of houses on that road. The non-motorized pathway cuts too far. How will this be handled?	The McWain Road option is not the alternative that is being proposed as the perferred alternative by the GCRC as part of the draft Environmental Assessment.
16	Alignment	Question	Verbal (Workshop)	NA	NA	NA	This project is to the benefit of Genesys, why is the McWain Rd. option being considered?	All reasonable options must be considered as part of the Environmental Assessment process. The McWain Road option is not the alternative that is being proposed by the GCRC as part of the draft Environmental Assessment.
17	Alignment	Question	Verbal (Workshop)	NA	NA	NA	Would there be plans to continue extending Dort Highway as per the original planned route from the 1980's to Fish Lake Rd.?	That alternative is not being considered at this time.
18	Alignment	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Look at an interchange at Baldwin and I-75.	Comment noted.
19	Alignment	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Option 2 for new road preferred. Never McWain Rd.	Comment noted.
20	Alignment	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Explore making exchange at Genesys Parkway at 600 building.	Comment noted.
21	Alignment	Comment	Written (Comment Form)	Michael Strans	2401 Lindsay Ln.	NA	I don't like the "McWain" option for the following reasons: 1) Reduced value to house! 2) Higher traffic 3) Higher speeds 4) Noise 5) Reduced frontage to house 6) Loss of natural setting 7) Interchange at Genesys Parkway and the 600 Medical Building	Comment noted.
22	Alignment	Comment	Written (Comment Form)	Randy Swianbek	2411 Lindsay Ln.	NA	East option best option; west option 2nd best option; McWain - No Way! This would required the purchase at fair market value of all of Whispering Pines Subdivision.	Comment noted.
23	Alignment	Comment	Written (Comment Form)	Randy Swianbek	2411 Lindsay Ln.	NA	My vote is not Dort Highway Extension. No value to residents.	Comment noted.
24	Alignment	Comment	Written (Comment Form)	Greg Rasmussen	2417 Pollock Rd.	NA	Please do not consider McWain Rd. as a realistic as a realistic alternative.	Comment noted.
25	Alignment	Comment	Written (Comment Form)	Paula Whalen	9214 McWain Rd.	NA	I have lived on McWain Rd. for 25 years and my husband lived on McWain Rd. his whole life. Our children have never lived anywhere else. It is too bad that our family means so little to a community that we have given our lives to. I work at Genesys so I know that a solution is needed. I think the original option - NOT the McWain Rd. option - would be better for everyone.	Comment noted.
26	Alignment	Comment	Written (Comment Form)	Bruce Freathy	9140 McWain Rd.	NA	Do not use McWain Rd. for an extension.	Comment noted.

27	Alignment	Comment	Written (Comment Form)	Judith Lanyi	9209 McWain Rd.	NA	We have lived here since 1966. Traffic and noise would be unbearable. Mr. Joseph has fought the Dort Hwy. extension for years and with person funds. What changed in the intensions of his will and charitable donations. We prefer the option thru Genesys property. Much less social impact.	Comment noted.
28	Alignment	Comment	Written (Comment Form)	Erin Janetsky	9035 Creekview Ct.	NA	McWain option seems the most logical; however, it will disturb the most residents.	Comment noted.
29	Alignment	Comment	Written (Comment Form)	Carol Jennings	2424 Pollock Rd.	NA	I am not in favor of the McWain solution. Less home impact with the Genesys route. Since this is to benefit the hospital, run it through the hospital property. If I had my way Dort would not be extended.	Comment noted.
30	Alignment	Comment	Written (Comment Form)	Donald Bowles	9212 Timberline Ct.	NA	Use McWain option - M54 to Fish Lake Rd. all the way to Pontiac - This was the original plan in the 1980s!	Comment noted.
31	Alignment	Comment	Written (Comment Form)	Victor S. Lanyi	9209 McWain Rd.	NA	We have fought the McWain Rd./Dort Hwy since 1969, and am still very much against it. The option through Genesys property makes better sense.	Comment noted.
32	Alignment	Comment	Written (Comment Form)	M. Shapiro	9413 Burning Tree Dr.	NA	Either Pollock option good for me. Not McWain.	Comment noted.
33	Alignment	Comment	Written (Comment Form)	Pamela Ciliax	3054 W. Baldwin Rd.	NA	McWain Rd. option is worst for social impact. Traffic increase is ridiculous for a neighborhood of homes. Option 2 that seems to across Genesys property would be the best. In the future, providing a sampling of this in for prior to meeting time would enable us to give more input.	Comment noted.
34	Alignment	Comment	Written (Comment Form)	Susan Trantham	9034 Creekview Ct.	NA	I like that you had several sets of displays so that we had plenty of room to get in to see up close. I would prefer the McWain option. It would seem to have less environmental impact. Either way, I like the idea of connecting Dort and Baldwin.	Comment noted.
35	Alignment	Comment	Written (Comment Form)	William C. French	2405 E. Baldwin Rd.	NA	Do not like McWain option because it takes most of my side yard plus our pool privacy is shot. Like Option 1 east of Pond to Baldwin.	Comment noted.
36	Alignment	Comment	Written (Comment Form)	Mike Smith	9472 McWain Rd.	NA	McWain Rd. NO! Being a resident on McWain Rd.; I object to that option. The impact on the residents will be catastrophic. It goes against the community master plan. Property values will tank. Local residents will suffer. There is much less social impact to take their Genesys property.	Comment noted.
37	Alignment	Comment	Written (Comment Form)	Kristine Scarber	3107 E. Baldwin Rd.	NA	The proposed McWain option impacts too many families. I do not think that this is the best option. Building on the Genesys property also allows for an entrance into the campus from the Dort Hwy extension.	Comment noted.
38	Alignment	Comment	Written (Comment Form)	Sharon Kelly	2407 Pollock Rd.	NA	It will destroy neighborhoods on Pollock and McWain Rd. Many on McWain have been there 40 to 50 years. Run it thru the field Genesys already owns. Grand Blanc has become Genesys-City.	Comment noted.
39	Alignment	Comment	Written (Comment Form)	Ken Johnson	6212 Mapleridge Dr.	NA	McWain Alternative - too many negative environmental impacts. If McWain is presented in EA should show improved Pollock Rd. east of McWain. Consumers Alternative - if future Pollock is not in the alternative don't show it.	Comment noted.
40	Alignment	Comment	Written (Comment Form)	Lee Wallace	9225 McWain Rd.	NA	Liked Option 1 with roundabout; didn't like McWain option.	Comment noted.

41	Alignment	Comment	Written (Comment Form)	Mike Yancho, Sr.	10640 Halsey Rd.	NA	Build it!!! I prefer Option 1, it is much better. I also like roundabouts at Dort (existing), Cook, and Baldwin Rd. I prefer to build roundabouts over future traffic lights! If for some reason the Genesys route fails, I support McWain Rd. I also advocate a future connection to the south of Baldwin to Fish Lake Rd!! A possible east/west connection to Thompson Rd./US 23 could then be possible.	Comment noted.
42	Alignment	Comment	Written (Comment Form)	Robert Ermiger	2368 Lake Ridge Dr.	NA	Not needed; a waste of taxpayer money. Holly Rd. ramp update needed and Holly Rd. needs to go under railroad track. I know this is going to happen and Option 1 impacts quality of living for homeowners.	Comment noted.
43	Alignment	Comment	Written (Comment Form)	Gary Vandemark	2151 E. Baldwin Rd.	NA	The McWain Rd. option makes no sense. I like roundabouts. As little impact with existing housing as possible.	Comment noted.
44	Alignment	Comment	Written (Comment Form)	Scott Bennett	2067 Larkspur Ln.	NA	No to using McWain option.	Comment noted.
45	Alignment	Comment	Written (Comment Form)	Scott Bennett	2067 Larkspur Ln.	NA	Option 1 for roundabout - traffic flow appears to be much smoother transitions	Comment noted.
46	Alignment	Comment	Written (Comment Form)	[Illegible]	2431 Lindsay Ln.	NA	Give Genesys a private exist off I-75	Comment noted.
47	Alignment	Comment	Written (Comment Form)	Joan Zito	2375 East Cook Rd.	NA	Build two! Genesys can dead end on Cook. They can build their own driveway! Split the traffic and build public road connecting to Dort.	Comment noted.
48	Alignment	Comment	Written (Comment Form)	Ron Wehner	2421 Lindsay Ln.	NA	Alternative through Genesys is likely least disruptive to property owners.	Comment noted.
49	Alignment	Comment	Written (Comment Form)	Lori Bewsack	9050 McWain Rd.	NA	I live on McWain. Talk about a huge impact, my house would essentially be totally invaluable. The noise, the traffic, no way. The problem is because of Genesys. Use their land for the new route. The impact would affect 90% less people and properties than the McWain Rd. option. Please, please keep our peaceful homes as they are now. The reason we bought the properties we did. The beautiful natural area that we have now.	Comment noted.
50	Alignment	Comment	Written (Comment Form)	[Illegible]	9404 McWain Rd.	NA	Do not bring Dort Hwy. down McWain Rd. There are too many homes that will be disrupted and home values affected. You have a viable option alternative to McWain that makes sense. Do not use McWain Rd.! The east side of the pond seems like the best option with the least impact to homes. Genesys is the main reason for the Dort Hwy extension. Take it through their property which has been donated for this project. Stay off McWain!	Comment noted.
51	Alignment	Comment	Written (Comment Form)	Ray Wascher	9230 McWain Rd.	raywascher@yahoo.com	Not down McWain. Safety - School buses, waste management, UPS, FedEx, children in the area. Speed of vehicles high now - would be worse if McWain is four-lane paved. Inconvenience of property owners on McWain Rd. Alternative 1 is best.	Comment noted.
52	Alignment	Question	Written (Comment Form)	Scott Brokoff	3140 Pollock Rd.	NA	Has there been any consideration to rerouting the off-ramp from southbound I-75 from Holly Rd. to Pollock Rd., then relocating the existing traffic signal at the end of the ramp over to Pollock/Holly intersection? (See drawing on back). This was done at the Eastman Road/US 10 ramp in Midland, Michigan to ease congestion at that interchange (off-ramp from eastbound US-10 to Eastman Road).	Yes. Several alternatives to alleviate congestion and improve safety have already been considered with some completed by the GCRC and MDOT at this location. The extension of South Dort Highway will also help improve safety by diverting some of the traffic from the Holly Road interchange.

53	Alignment	Comment	Written (Comment Form)	George Nitsos	9424 McWain Rd.	NA	I would prefer that the extension go thru the Genesys property. The disruption both socially and economically would be severe if McWain were reconfigured, as opposed to a new build that would exactly meet the goals and demands of the project. I understand that using an existing road would be more economical regarding money, but in the long run, the Genesys property options would better meet the needs, and would be easier to configure.	Comment noted.
54	Alignment	Comment	Written (Website)	Alexander Nitsos	9424 McWain Rd.	nitsosa@gmail.com	I understan the reasoning behind creating an extension off of the Dort Highway exit in Grand Blanc. Having used the I-75 ramps on Holly Road, I know they can become very congested. However, I am strongly against the proposal to construct the extension to go straight into McWain Rd. We, like many of the other residents on this street, have lived here over twenty years with some much longer than that. It is a quiet, peaceful dirt road where I grew up. I do not want to see my home and the other homes that are close to the road, subject to high volumes of traffic when there are other alternatives that would not affect our neighborhood directly. From the look of the other alternatives in the agenda and environmental impact reports from June, putting the extension closer to the actual hospital as well as the entrance to the emergency center would make the most sense instead of using McWain. I implore you to consider the other altenratives and not use McWain Road as an exit ramp so as to preserve the lives that we build on our quiet road.	Comment noted.
55	Alignment/Drainage	Comment	Written (Comment Form)	Philip Rice	3090 Pollock Rd.	NA	We would prefer that the Dort Hwy extension go south thru the Genesys hospital property. It makes good sense to go this route as the hospital does wish to relocate Pollock Rd. Currently, the County has failed to take care of drainage problems along Pollock Rd. Encouraging the hospital to proceed with the relocating of Pollock Rd. would possibly help to solve some of these problems. We can only hope that this project moves forward quickly and the citizens of this area are not left hanging!	Comment noted.
56	Alignment/Drainage	Comment	Written (Comment Form)	Ken Morse	3070 Pollock Rd.	NA	In support of my neighbor's on McWain Rd. I am 100% opposed to Option 2. In regards to my situation I still demand that the drainage on the hospital property be addressed and fixed immediately. I've been made fun of and ignored by the hospital and lied to by the County and Township for years. Also my house had become unsellable because of my flooding problem caused by the hospital property. Also being that the hospital will benefit the most, I would be in favor of Option 1.	Comment noted.
57	Alignment/Drainage	Comment	Written (Comment Form)	Roxanne Slackta	2510 E. Cook Rd.	rs25100@gmail.com	McWain Road is cheaper and will save taxpayers and State of Michigan a lot of money. Less flooding.	Comment noted.
58	Alignment/Noise	Comment	Written (Comment Form)	Wisson Slangor	2444 Lindsay Ln.	NA	If Option 1 is chosen, then a wall is required along Dort Hwy. east of Whispering Pines Subdivision. No to McWain route.	Comment noted.
59	Alignment/Noise	Question	Written (Comment Form)	NA	NA	NA	A lot of concerns about how close McWain option would be to people's houses. What happens to value of homes on Pollock and noise impacts? Are there any plans to improve Pollock between new Dort Hwy. to Holly? People think a lot of traffic will go down Pollock.	The McWain Road option is not the alternative that is being proposed as the perferred alternative by the GCRC as part of the draft Environmental Assessment.

60	Alignment/Traffic	Comment	Written (Comment Form)	Emily Tersigni	2441 Pollock Rd.	NA	Dort Hwy. Ext. would be awful for the residents around the area! Horrible idea! Why don't we cut traffic on Holly Rd. by creating an entrance to I-75 from Baldwin Rd. and fix the I-75 entrance on Holly first, then see if traffic reduces. Thank you.	Comment noted.
61	Alignment/Traffic	Comment	Written (Comment Form)	Dean Tersigni	2441 Pollock Rd.	NA	McWain Rd. option, while cheaper, has a far more significant negative impact on far more residents. Part of the reason I risked buying a house on Pollock where I did was because all the literature at the time did not include McWain Rd. None of the residents want Dort Highway traffic running through their front yards.	Comment noted.
62	Alignment/Traffic	Comment	Written (Comment Form)	Joe Darmafall	2249 E. Cook Rd.	NA	Traffic on Cook is already heavy and out-of-control with people coming and going from neighborhoods. I would prefer a Dort expansion with road bridged over Cook. Lot of home values will be lowered.	Comment noted.
63	Alignment/Traffic	Comment	Written (Website)	Gilbert Bonno	3130 Pollock Rd.	gkbonno@yahoo.com	I am not opposed to the Dort Hwy extension but would submit that the best route is to the East of the high power lines. I would also suggest that if this is the route, that improvements be made to present day Pollock road. With the Dort Hwy extension the amount of traffic that Dort hwy creates will also increase the amount f traffic that Pollock Road will see on a daily basis. It already has been an increase since Genesys opened their doors. The road was not originally constructed to handle this amount of traffic and will not be able to handle the increased taffic as a result of Dort Hwy. I would strongly encourage that Pollock Road be re engineered/rebuilt to handle the traffic volume that will be on Pollock road.	Comment noted.
64	All topics	Comment	Written (Comment Form)	Linda Sherwood	3063 W. Maple Ave.	NA	I'm in the area that is in the Bishop Airport possible expansion. We've been kept in the dark until we see trucks and workers. You appear to be providing public information at timely benefit but it's still hard to shake the thought that this is a done deal. Decisions have been made by the companies in charge. Please save the wetlands, as many homes as possible, and give the unfortunate homeowners a fair price for their sacrifice.	Comment noted.
65	All topics	Comment	Written (Comment Form)	Marjorie Rich	3020 Pollock Rd.	NA	McWain Rd. alternative will have less environmental impact in my opinion. Also resurface the original Pollock Rd., and leave it where it is.	Comment noted.
66	All topics	Comment	Written (Comment Form)	Mark Titus	9317 McWain Rd.	NA	The proposed bike path would end up 20-30 feet from my front door. I would lose half of my driveway. I moved into my home 10 years ago. A nice, quiet gravel road. With this option (McWain Rd.). My home is 90 feet off of the gravel road. This Dort option would bring the bike path to within 40 feet of my home. We also have lots of wildlife in this area. We see deer, turkey, fox, cranes, ducks, geese. This would really hurt the wildlife in our area. With so many homes in this area, too many residences and children for this kind of volumes of traffic and speed. Very dangerous. My property value would plummet. I also own the building lot next to my home as well.	Comment noted.
67	All topics	Comment	Written (Comment Form)	Sharon Titus	9317 McWain Rd.	NA	We moved into our home 10 years ago and have enjoyed the wildlife and privacy. With this road (Dort Hwy.) it would use a lot of our frontage and that would lower the value of our home. We have beautiful mature trees and they would have to be removed. I have grandchildren and a special needs daughter and the increased traffic would pose a risk. We also own the property next to our house. The proposed bike path would really cut our property.	Comment noted.

68	All topics	Comment	Written (Comment Form)	Matt Schroeder	9033 McWain Rd.	NA	Building the extension on McWain would dramatically affect all residents along McWain. Please don't build a highway across my front yard where my children play. Building the extension down McWain will dramatically increase traffic, noise, and pollution to my home, create a danger to my children, encroach on my property, and significantly reduce my property value which has still not recovered to what I paid for it. Please don't choose the option that would put Dort Highway on my front road. The option to build on Genesys property makes the most sense.	Comment noted.
69	All topics	Comment	Written (Website)	Brian Ianyi	9135 McWain Rd	bgizmo68@gmail.com	My family and all the neighbors are very much against bringing Dort down Mcwain rd. You would be negatively impacting many more homeowners on Mcwain than bringing it down the power lines. Looks like only 2-4 houses affectged with that route.	Comment noted.
70	All topics	Comment	Written (Website)	Rob Trudeau	3375 Pollock Road, Grand Blanc, MI 48439	rdtrudeau@sbcglobal.net	Can we stop talking about it and get it done! we've been hearing about this wonderful dort extension for over 5 years and still nothing has been done!!! If it's so wonderful and is going to create so many jobs, then why is it taking so long to be completed?!	Comment noted.
71	All topics	Comment	Written (Website)	Linda Perry	3348 Pine Villa Court Grand Blanc, MI	Llafay@aol.com	I think it is horrific to uproot sixty plus homes when it could be done affecting one farmhouse	Comment noted.
72	All topics	Comment	Written (Website)	Paravila Jacob	2214 Village Woods Dr.	paravila@gmail.com	Dort highway extension plan is on going for the last 40 years, but nothing is happening. For the short term at least pave the McWain raod and repave Pollack road.	Comment noted.
73	All topics	Comment	Written (Comment Form)	Kanssl Steward	2511 Pollock Rd.	NA	I bought my house 2 years ago because Pollock was a quiet neighborhood and not very busy. My husband and I both work in Auburn Hills and believe that drive to work was worth the neighborhood. The day I realized that this roadway was a possibility I became sick to my stomach at the the thought of the roadway increasing traffic, noise, and decreasing my property values. Had I known this I would not have bought my house. Pollock is literally falling apart as is and now traffic is going to increase damaging it further. I would prefer if speed is kept to as much of a minimum to increase safety of the neighborhood kids and pets as well as reduce the traffic noise. I also would like a sound barrier of sorts, so the community is not affected as much. The bikeway doesn't mean a whole lot since bikes are not allowed on Genesys anyway and if down McWain it goes nowhere and it affect property owners for not much benefit. If the road follows the powerlines it would be nice to have a path that connects to the current path that passes Sweetwater. If down McWain I don't think it helps much since it goes nowhere and it will greatly affect property owners on McWain. Personally I would prefer Option 1 or 2 as it will affect less people and selfishly hopefully keep traffic past my house to a minimum.	Comment noted.
74	All topics	Question	Written (Comment Form)	Kenneth K.(?)	2407 Pollock Rd.	NA	McWain Road. Main school bus route. Deprive Genesys of property, not people and homes. No turnaround. Five (5) big oaks on our property alone. Animals and people walk road all the time. Ready to buy all our homes? We live on corner of McWain and Pollock. If this was on plans 60 years ago, why did you let people buy property and build homes on McWain?	The McWain Road option is not the alternative that is being proposed as the perferred alternative by the GCRC as part of the draft Environmental Assessment.

75	Bike/Ped Connectivity	Comment	Written (Comment Form)	Canosa Enterprises	4100 Baldwin Rd.	NA	Option 1 plus Option 2 will have a beneficial impact on People's Health and Wellness thus increasing positive social impact. We support these two options with the guarantee of a non-motorized path. We disagree with the McWain Rd. option since it has less environmental impact but would have a huge social impact by reducing the size of property, homeowners plus huge impact on the current social impact on Crim training groups and other running and walking groups. They will not be able to train with so many cars driving on McWain Road (900 cars to 10,000 huge increase). The car pollution will be quite heavy and strong for all people involved... homeowners and runners/joggers/walkers. Our friend Tim Giles who has run the Crim for 39 years and was featured on ABC news (June 2016) since he will be running his 40th Crim race. He has been training himself and his group on McWain Road. This will greatly impact this running group and other Crim running groups plus other athletes.	Comment noted.
76	Bike/Ped Connectivity	Question	Verbal (Workshop)	NA	NA	NA	How will the non-motorized pathway be designed? Could it have 2 lanes for bikes plus a walking lane?	Non-motorized pathways for bicycles that are completed utilizing Federal funding must be designed in accordance with the "Guide for the Development of Bicycle Facilities 2012, Fourth Edition (AASHTO Bike Guide)". This option can be reviewed for conformance with these design guidelines once final design for the project begins.
77	Bike/Ped Connectivity	Question	Verbal (Workshop)	NA	NA	NA	If the route through Genesys is chosen, could a pedestrian bridge be built across the extended Dort Hwy. to provide access to the Lindsay Lane residents?	A cost-benefit analysis can be completed during the design of the project, and weighed against other alternatives, in order to determine the most practicle method of providing access to the trailways for the residents of this area.
78	Bike/Ped Connectivity	Question	Verbal (Workshop)	NA	NA	NA	Will non-motorized pathways be connected to Grand Blanc Rd. path?	It is proposed to provide a non-motorized pathway as part of this project, located within the construction limits of the proposed roadway extension. A pathway connecting to the Grand Blanc Road non-motorized trail will need to be considered and approved by the township as part of a separate project.
79	Bike/Ped Connectivity	Question	Verbal (Workshop)	NA	NA	NA	Will safe and easy access to the Genesys trails be maintained across the new section of Dort Hwy.?	Access to the non-motorized pathway and the Genesys trailways for residents living west of the proposed alternative will be considered during the final design of this project.
80	Bike/Ped Connectivity	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Must have save passage from Lindsay Ln. to the current walking path at Genesys.	Comment noted.
81	Bike/Ped Connectivity	Comment	Written (Comment Form)	Randy Swianbek	2411 Lindsay Ln.	NA	Walking foot bridge for access must be erected for access to the walking trail.	Comment noted.
82	Bike/Ped Connectivity	Comment	Written (Comment Form)	M. Shapiro	9413 Burning Tree Dr.	NA	Most important element is non-motorized pathway. Please make it bicycle two-way plus pedestrian with 3 lane non-motorized.	Comment noted.
83	Bike/Ped Connectivity	Comment	Written (Comment Form)	Scott Bennett	2067 Larkspur Ln.	NA	Yes, on roundabout and yes on non-motorized path.	Comment noted.
84	Bike/Ped Connectivity	Comment	Written (Comment Form)	Scott Bennett	2067 Larkspur Ln.	NA	Bike/non-motorized paths connected to Grand Blanc Rd. path.	Comment noted.
85	Bike/Ped Connectivity	Comment	Written (Comment Form)	[Illegible]	2431 Lindsay Ln.	NA	In favor of non-motorized pathway	Comment noted.
86	Bike/Ped Connectivity	Question	Written (Comment Form)	Ron Wehner	2421 Lindsay Ln.	NA	Lindsay Ln. residents wish to retain access to Genesys trails. Can a pedestrian bridge or tunnel be put in across the extended Dort Hwy. if route goes through Genesys?	A cost-benefit analysis can be completed during the design of the project, and weighed against other alternatives, in order to determine the most practicle method of providing access to the trailways for the residents of this area.

87	Drainage	Question	Verbal (Workshop)	NA	NA	NA	Will drainage on Old Cook Rd. be improved?	The limits of drainage improvements along Old Cook Road will be dependent on the final impact that the extension of South Dort Highway has at this location. It is anticipated that some improvements will take place, but the amount of improvements will not be known until the final design of the project is underway.
88	Drainage	Question	Verbal (Workshop)	NA	NA	NA	Will Pollock Rd. drainage be improved?	The limits of drainage improvements along Pollack Road will be dependent on the final impact that the extension of South Dort Highway has at this location. It is anticipated that some improvements will take place, but the amount of improvements will not be known until the final design of the project is underway.
89	Drainage	Comment	Written (Comment Form)	Roxanne Slackta	2510 E. Cook Rd.	rs25100@gmail.com	To the north is Old Cook Rd., the dead-end. I own the last home to the east on Old Cook Rd. The property is in 100-year floodplain. With one day of rain the water will be like a lake in my backyard. Not a hard rain is needed for this. In 2011 we had 3 day rain. From my 20 foot high deck water was 20 feet deep.	Comment noted.
90	Environment	Question	Verbal (Workshop)	NA	NA	NA	How will the wetlands be protected?	While impacts to wetlands are anticipated as part of this project, they will be limited whenever possible. Wetland impacts will be mitigated in accordance with MDEQ requirements.
91	Environment	Question	Verbal (Workshop)	NA	NA	NA	Mature trees will have to be removed. How will this be compensated for?	Compensation for tree removal for those located outside of the existing roadway right-of-way will be negotiated as part of the property and easement negotiations. Replacementment trees may be used to mitigate tree removals.
92	Environment	Question	Verbal (Workshop)	NA	NA	NA	There is a large nesting population of Woodcock in the area of the powerlines, it has also been a deer crossing. There are also populations of turkey, fox, cranes, duck, and geese in there area. Is this being taken into consideration?	Environmental impact considerations for plants and animals are being considered, and weighed against other impacts, as part of the Environmental Assessement prossess.
93	Environment	Comment	Written (Comment Form)	Rick Freathy	9140 McWain Rd.	NA	Large nesting population of Woodcock in area east and west sides of power lines (south of Cook Rd. and north of Pollock Rd.). This area has also been a natural deer crossing for the last 50 plus years.	Comment noted.
94	Environment	Comment	Written (Comment Form)	Roxanne Slackta	2510 E. Cook Rd.	rs25100@gmail.com	There is also a 140 year old oak tree in the front yard of 2510 E. Cook. State of Michigan said it is the 13th largest in the State. The endangered Woodcock bird also exists in the property to the south.	Comment noted.
95	Environment	Comment	Written (Comment Form)	[Illegible]	2431 Lindsay Ln.	NA	Concerned about tree removal by Option 2	Comment noted.
96	Environment	Comment	Written (Comment Form)	Cathy Lane	5366 Kimberly Dr.	NA	Protect wetlands. McWain without roundabout west of pond or use "T" intersection.	Comment noted.
97	Information	Question	Verbal (Workshop)	NA	NA	NA	Can the maps from the meeting be made available to the public?	Yes. The GCRC will be posting them on-line for review.
98	Information	Question	Verbal (Workshop)	NA	NA	NA	Could meeting information be provided before future meetings to allow for more informed discussion?	Yes. The next meeting will be the public hearing to review the findings from the federal review of the draft Environmental Assessment document. This requires a 30 day public notice prior to that meeting.
99	Information	Question	Verbal (Workshop)	NA	NA	NA	Why was this possibility of extension not widespread public knowledge in the past?	The potential extension of South Dort Highway has been considered on several occasions, most recently since 2009 as part of the Genesee County Freight and Connectivity Study which has been available for review on both the Genesee County Metropolitian Planning Commission and the Genesee County Road Commission websites.
100	Information	Question	Verbal (Workshop)	NA	NA	NA	Will there be more notice for future meetings?	Yes. The next meeting will be the public hearing to review the findings from the federal review of the draft Environmental Assessment document. This requires a 30 day public notice prior to that meeting.

101	Information	Question	Written (Comment Form)	Randy Swianbek	2411 Lindsay Ln.	NA	How has this progressed this far without a vote of those immediately affected?	The potential extension of South Dort Highway has been considered on several occasions, most recently since 2009 as part of the Genesee County Freight and Connectivity Study which has been available for review on both the Genesee County Metropolitian Planning Commission and the Genesee County Road Commission websites.
102	Information	Question	Written (Comment Form)	Erin Janetsky	9035 Creekview Ct.	janetskys@hotmail.com	Can these maps that are at the meeting be sent through email?	The GCRC will be posting them on-line for review.
103	Information	Comment	Written (Comment Form)	[Illegible]	9404 McWain Rd.	NA	It's deplorable that we get one day's notice to this meeting! You have know about this long enough in advance for more notice!	Comment noted.
104	Information	Comment	Written (Website)	Mart Titus	9317 McWain Rd.	titus3five@hotmail.com	We need some information as to the current status of the Dort Extension. It would really impact me in a negative way. The proposed bike path is 30 ft. from my front porch. I also own the buidling lot next door (adjacent) to my property. The dort extension would render this lot unbuildable. Very unfair. I have a special needs daughter who likes to play outside. I wouldn't safe for her do so. Please give us an update. Thank you.	Comment noted.
105	Information	Question	Written (Website)	Kenneth Kelly	2407 Pollock Rd.	kskelly56@comcast.net	When is the next meeting on the Dort Extension going to be held. Is it going to be in the same location as last time. thanks, Ken.	Responded with the date, time and location.
106	Noise/Privacy	Question	Verbal (Workshop)	NA	NA	NA	How would potential privacy issues arising from new roadway be handled?	Need more detail on what is being requested prior to answering this question.
107	Noise/Privacy	Question	Verbal (Workshop)	NA	NA	NA	Will there be sound suppression and vegetation near housing for neighborhoods near the proposed road?	A noise study is being conducted as part of the Environmental Assessment process. Measures for abatment of noise above the federal guidelines will be included in the draft Environmental Assessment document as necessary.
108	Noise/Privacy	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Must have sound buffer shrubs and vegetation near housing at end of Lindsay Ln.	Comment noted.
109	Noise/Privacy	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Very concerned about noise.	Comment noted.
110	Noise/Privacy	Comment	Written (Comment Form)	Erin Janetsky	9035 Creekview Ct.	NA	Concerned about noise level so close to our backyard.	Comment noted.
111	Noise/Privacy	Comment	Written (Comment Form)	Bob Trittem	9217 Timberline Dr.	NA	I prefer the McWain Road route. You already have a road there, why build an entire new road? Use what you have. I live on Timberline and I am very concerned about noise issues. Too much. Move the road over more toward the east to reduce noise.	Comment noted.
112	Noise/Privacy	Comment	Written (Comment Form)	Scott Bennett	2067 Larkspur Ln.	NA	Sound barrier needed along Dort.	Comment noted.
113	Noise/Privacy	Comment	Written (Comment Form)	[Illegible]	2431 Lindsay Ln.	NA	Noise from Option 2, noise abatement	Comment noted.
114	Noise/Privacy	Comment	Written (Comment Form)	Ron Wehner	2421 Lindsay Ln.	NA	Noise barrier should isolate Lindsay Ln. neighborhood from noise.	Comment noted.
115	Noise/Privacy	Comment	Written (Comment Form)	Ray Wascher	9230 McWain Rd.	raywascher@yahoo.com	Noise - Can't have windows open on front of house because of traffic noise now (June 2016)	Comment noted.

116	Noise/Privacy	Comment	Written (Website)	Victor Lanyo	9209 McWain Rd.	Vjl2116@aol.com	Why disrupt all of the homes affected by putting extension on McWain Rd with excessive noise and traffic. It seems that it would be more practical and have much less social impact if the extension can be put along the power line where very few homes would be affected.	Comment noted.
117	Noise/Privacy	Question	Written (Comment Form)	Anita Bissone	2486 Lindsay Ln.	NA	Very concerned about noise to residential area. Also losing access to walking path at Genesys. Currently living with construction with assisted living facility. This will reduce the value of my home. If you go with Alternative 1 will you put in berms to reduce noise?	A noise study is being conducted as part of the Environmental Assessment process. Measures for abatment of noise above the federal guidelines will be included in the draft Environmental Assessment document as necessary. There will be no access restrictions to the walking paths on the Genesys property.
118	Pavement Condition	Question	Verbal (Workshop)	NA	NA	NA	In "Option 2" will McWain Rd. be paved?	No improvements to McWain Road would occur with options 1 and 2 (roadway built adjacent to Consumers Energy property).
119	Pavement Condition	Question	Verbal (Workshop)	NA	NA	NA	Will Pollock Rd. be repaved?	The limits of roadway improvements along Pollack Road will be dependent on the final impact that the extension of South Dort Highway has at this location. It is anticipated that some improvements will take place, but the amount of improvements will not be known until the final design of the project is underway.
120	Pavement Condition	Comment	Written (Comment Form)	Jeffrey Wilson	2496 Lindsay Ln.	NA	Must repave Pollock Rd. and McWain Rd.	The limits of roadway improvements along Pollack Road will be dependent on the final impact that the extension of South Dort Highway has at this location. It is anticipated that some improvements will take place, but the amount of improvements will not be known until the final design of the project is underway.
121	Pavement Condition	Question	Written (Comment Form)	Greg Rasmussen	2417 Pollock Rd.	NA	The condition of both Pollock Rd. and McWain Rd. has always been terrible. What makes anyone believe that sufficient attention will be made in the future?	Improvements to local roadways are a joint effort between the Townships and the GCRC, and are dependent on the amount of funding available to properly complete these upgrades. South Dort Highway extended would be a federal-aid elegible roadway and not subject to the same fiscal constraints that the local roadways are.
122	Pavement Condition	Comment	Written (Comment Form)	Bruce Freathy	9140 McWain Rd.	NA	I hope you plan to repave Pollock Rd.	Comment noted.
123	Pavement Condition	Question	Written (Comment Form)	Mariann Quaderer	3110 Pollock Rd.	NA	What is going to happen to Pollock Rd. in front of Cherry Creek Hollow? Resurface? Any improvements?	The limits of roadway improvements along Pollack Road will be dependent on the final impact that the extension of South Dort Highway has at this location. It is anticipated that some improvements will take place, but the amount of improvements will not be known until the final design of the project is underway.
124	Pavement Condition	Question	Written (Comment Form)	Gilbert and Karen Bonno	3130 Pollock Rd.	NA	What is going to happen to Pollock Rd. in front of Cherry Creek Hollow subdivision? Will it be improved?	The limits of roadway improvements along Pollack Road will be dependent on the final impact that the extension of South Dort Highway has at this location. It is anticipated that some improvements will take place, but the amount of improvements will not be known until the final design of the project is underway.
125	Traffic/Speed	Comment	Verbal (Workshop)	NA	NA	NA	McWain is too heavily residential to safely carry Dort Hwy.'s traffic load.	Comment noted.
126	Traffic/Speed	Question	Verbal (Workshop)	NA	NA	NA	Traffic is already uncontrollable on Cook Rd. Will there be increased police funding to ensure the roadways are safe?	Levels of funding for the township police are dictated by Grand Blanc Township. The GCRC does not control police funding.
127	Traffic/Speed	Question	Verbal (Workshop)	NA	NA	NA	What will the speed limits be on each of the options?	The proposed design speed that the alignment concepts were developed with is 45 mph. Final posted speed limit will be determined during final design of the project.
128	Traffic/Speed	Comment	Written (Comment Form)	Greg Rasmussen	2417 Pollock Rd.	NA	The impact of 10x (900 cars) per day down McWain Rd. is unimaginable. Too many homes and people.	Comment noted.
129	Traffic/Speed	Comment	Written (Comment Form)	Erin Janetsky	9035 Creekview Ct.	NA	Don't like the idea of more traffic near Cook Rd.	Comment noted.

130	Traffic/Speed	Question	Written (Comment Form)	Ted Piotraczk	2444 Pollock Rd.	NA	What will speed limits be on options?	The proposed design speed that the alignment concepts were developed with is 45 mph. Final posted speed limit will be determined during final design of the project.
131	Traffic/Speed	Comment	Written (Comment Form)	Larry Darmafall	2240 E. Cook Rd.	NA	The traffic on Cook between Holly and Fenton Road is heavy and uncontrollable now. There is a long straight away and speeds of 60-70 mph are not uncommon. The cars don't honor red lights on school buses now. To increase traffic on Cook would be a nightmare. There has to be long term budget for increased police. They don't have manpower for existing mess. Dort is state road MSP should take care of it.	Comment noted.
132	Traffic/Speed	Comment	Written (Comment Form)	Roxanne Slackta	2510 E. Cook Rd.	rs25100@gmail.com	Cook Road traffic is very heavy.	Comment noted.
133	Traffic/Speed	Comment	Written (Comment Form)	Ray Wascher	9230 McWain Rd.	raywascher@yahoo.com	Car count on McWain between Cook and Pollock is way low at 950 per day. Traffic down McWain would increase 10-fold as soon as the extension is complete. Cars exiting Holly Rd. would take the extension as soon as it opens. By 2020 the increase 100-fold when the truckers learn about it.	Comment noted.
134	All topics	Question	Written (Website)	Craig St. John	9104 McWain Rd.	NA	If this project is approved and goes down McWain Rd., it will absolutely destroy all home values on McWain. What are the plans to buy out all the homeowners? The traffic increase will be a giant risk to the health and safety of all residents on McWain Rd. due to trucking traffic, increased bolume and surely higher speeds after the road is paved. I received notice of the public meeting from Rowe Engineering THE DAY AFTER THE MEETING!!! The posmark was 6/27/16, why in the world wasn't this sent out MUCH earlier? I am absolutely AGAINST the proposal to use McWain Rd.	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!

135	Alignment	Comment	Written (Website)	Cindy	2384 E. Cook Rd.	NA	I have just been told that there may be [or is] a proposal to extend Dort Highway right next to my home on East Cook Rd. That is ludacris! My home sits on the corner of E. Cook Rd. and McWain Rd. I chose to purchase this home a little over two years ago in part because of the location. Close to conveniences of the city and highway (I-75), and far enough away from the hustling speeds and noise of traffic. While I understand the need for expansion of roadways due to greater population, I do NOT feel that putting a wedge (Dort Highway) in the heart of private homes would be a wise or safe decision. Please reconsider this ignorant idea to extend Dort Highway next to my [and my neighbor's] homes(s). Or, at least give ample time for us to sell our homes before you decide to lower the value of all of them.	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!
136	Environment	Comment	Written (Website)	Tamara Dailey	9069 McWain Rd.	NA	Dear Mr. Wheatley, As a resident of 9069 McWain Rd., my family is devastated after learning about the proposed Dort Highway extension going down our quiet unpaved road. My family built this house in 2009, after years of trying to get approval from Grand Blanc Township and the MDEQ because my lot has a wetland and is located on a floodplain. We also had to have it evaluated by Applied Ecosystems. We searched for years trying to find a lot, and I would never have purchased property on a five lane highway. My property has a wide variety of wildlife and birds. The wetland is full of cattails, wildflowers, and milkweed, the main food source of monarch butterflies. I have documentation from the MDEQ and Applied Ecosystems regarding the wetland and the floodplain. Sincerely, Tammy Dailey 9069 McWain Road Grand Blanc, MI 48439	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!

137	Alignment	Comment	Written (Website)	Peggy Cripps	9065 McWain Rd.	NA	I cannot stress how much I am against using McWain Rd. as one of the alternative routes for your Dort Hwy. Extension. This will greatly reduce my property value, create loss of usable land and create an unsafe atmosphere. I will expect to be bought out on my property at the 150% minimum if you should think this is the avenue you will take. The plan will no longer make my property usable, or safe, and I would hope that first you rethink this option. I will be force to relocate myself and my family to a better environment.	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!
138	Alignment	Comment	Written (Website)	Ray Wascher	9230 McWain Rd.	NA	McWain Rd. should not be used for the Dort Highway Extension: SAFETY; 4 different busses use McWain for pick-up/drop-off children; trash pick-up on this road would be impaired by more traffic using McWain Rd.; UPS/FedEx deliveries are made up and down McWain Rd.; increased traffic negatively impact the ability of current residents to be able to access their drives A new road would not impact the safety of the residents as there would be no access to the NEW roadway from property owners. There would be no trash pick-up or school bus issues with the NEW road. No bus stops or trash pick-up sites.	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!

139	Alignment	Comment	Written (Website)	Mike Shinabarger	9156 McWain Rd.	NA	As a taxpayer and homeowner, I strongly oppose the option of using McWain Rd. to extend Dort Highway. The speed limit and amount of traffic using McWain is already excessive, and extending Dort using McWain will increase this exponentially. I am not willing to lose part of our yard and risk the safety of our children, not to mention decreased home values. Please build the extension road elsewhere. Very sincerely, Mike Shinabarger	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!
140	Alignment	Comment	Written (Website)	Brian Kozumplik	9130 McWain Rd.	NA	I was unable to make to the public comment forum held last month due to my work schedule. I have several key comments that need to be communicated to leadership of this project. 1) You cannot take a local country road such a McWain Road and turn it into a major highway connecting Flint with the Genesee County's premier Health Complex. 2) The original proposed path aligning with the electric line corridor will be the least impact to taxpayers and homeowners in the area. If we wanted to live on Dort Highway, then we would have bought a home on south Dort Highway in Flint or Burton and secured guard dogs, fencing, and home security systems. 3) Most homes along McWain Road between Cook Road and Pollock Road do not have the frontage to allow road easements for a major highway such as Dort Highway. You would have to purchase up most of these homes at market rate, and would drive up costs before you even started to move dirt. Please consider these as very valied issues that must be considered to keep the Dort extension thru the electrical corridor, as originally planned. This can be a beautiful addition to southern Genesee County, and with the natural woodlands and rollowing meadows, would almost appear as a Boulevard styel roadway. Kind Regards, Brian J. Kozumplik	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!

141	Alignment	Comment	Written (Website)	Debby Hux	9404 McWain Rd.	NA	As a resident of McWain Rd. for 23 years, my comment on the extension of Dort Hwy. is of course for it to be built along the powerlines as it is between Hill and Grand Blanc Rds. This makes the most sense as it impacts the least amount of homes. Bringing Dort Hwy. down McWain Rd. would have a devastating impact on ALL of the homes and families including and perhaps most important being our property values. Families on McWain Rd. have worked long and hard to take care of our homes and build a safe neighborhood for our children, and this project would wipe all that out. There is a good option available (which I believe includes land donated by Genesys Hospital just for this purpose) that would impact far fewer homes. DO NOT extend Dort Hwy. down McWain Rd.!	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!
142	Alignment	Comment	Written (Website)	Candice Weiss	9040 McWain Rd.	NA	I DO NOT WANT THIS!!! I want to express my concerns regarding the Dort Hwy. extension. I am a single woman who struggles to maintain my homestead without this issue coming up. My concern is that my property value will be greately impacted which I am already in a negative equity position. I will lose a large portion of my front yard. The increase in traffic will be a huge problem I feel that I would be at a higher risk of being unsafe with the more people that will be driving past my house and the people coming from FLINT. I have two dogs and they would not have a safe place to be. The semi traffic will greatly increase which will create a noise issue. THe amount of traffic will be a huge problem for me. Most ofall I do not want this and it will effect me in a negative way!!! I am already in a negative equity value with the economy and I cannot afford this problem as well. This will for sure be an external obsolescence!!! If I lost 50 ft from center of the road I will not be able to store my trailer in my driveway which I will need to then rent a place to keep this in addtion to othe rissues. I DO NOT WANT THIS!! My gas main is in the middle of my front yard and this is a stupid idea!!! There are 90 homes this will effect and the huge amount of traffic increase is too much for our area.	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!

143	Alignment	Question	Written (Website)	Juliana McPhilimy	9347 McWain Rd.	NA	I do not understand, how many roads do people need to get to that hospital? What is wrong with the Holly Rd. exit? People all over the state, country, beg for better roads, and you are looking to spend a gross amount of money for an extra access? I don't see any traffic jams around here. What about our homes, the property value, the safety of our children. Cutting a few minutes travel time trumps all that? A boat load of the traffic from Cook to Pollock is for the hospital. How can you waste our tax dollars like this! Fix the roads and dangerous bridges in our state! Is this another example of putting big business ahead of the little guy? Julie McPhilimy	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!
145	Environment	Comment	Written (Website)	Jame Sheffer	9030 McWain Rd.	NA	I have heard about the Dort Highway extension for some time and thought it was already planned to run along the power lines to Baldwin Road. Then I get a letter showing McWain Rd. as an alternate plan. Since this is an environmental study I would like to address that subject. McWain Rd. has many mature trees that have been there for decades that would have to be removed for this project. These trees provide a home for birds and shade for homes. Without shade, more electricity will be used to cool my home causing more fossil fuels to be used impacting the environment. Also the air quality would suffer from car and truck exhaust heading to the hospital and the future Meijer store on Baldwin Rd. Please stick with the original plan and preserve our neighborhood. Thank you, Jim Sheffer.	Thank you for taking the time to submit a response back to the Genesee County Road Commission regarding the potential extension of Dort Highway to Baldwin Road. All comments received will be added to the Draft Environmental Assessment Document which will be submitted to the Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) for review and concurrence of the potential preferred alternative route. Please understand that as part of this process, all potential feasible routes needed to be considered and included in the Environmental Assessment Document (including McWain Road). From these potential routes we then consider the impact that a new roadway will have on a number of different items, such as wetlands, floodplains, plants, fauna, noise, pollution, cultural/historical, economical and the people living adjacent to the roadway. Based on these impacts and comments received from the public meeting as well as those supplied to the road commission, the McWain Road Option will not be the selected “preferred alignment alternative” for the Draft Environmental Assessment. Option 1 – the Genesys Route with the roundabout west of the pond at I-75 has been recommended as the preferred alternative by the Genesee County Road Commission for approval by the FHWA and MDOT. Once we receive comments back from the FHWA and MDOT regarding the draft Environmental Assessment document, we will conduct a public hearing to review the findings of the FHWA (90-120 days from now). The meeting will be advertised for thirty days prior to the date of the meeting and the FHWA / MDOT comments and Environmental Assessment document will be available for review prior to the meeting. Thank you again for taking part in this extremely important public input process!

APPENDIX M

CHARTER TOWNSHIP OF GRAND BLANC MASTER PLAN

master plan

Charter Township of Grand Blanc
Genesee County, Michigan

2013 Supplemental Amendment

Prepared by

Charter Township of Grand Blanc Planning Commission

APPROVED BY THE PLANNING COMMISSION - AUGUST 1, 2013

acknowledgements

township board

Marilyn Hoffman, Supervisor | Cris Rariden, Clerk | Earl Guzak, Treasurer | Larry Anderson | Scott Bennett | Clark Kent | Jude Rariden

planning commission

Daniel Gellings (Chairperson) | Joe Johnson | Jay Hoffman | Vince Bandurski | Ed Brown | Dolores Coulter | Jeff Cyphert | Ron Goldie | Scott Bennett (Trustee)

with assistance from:
Birchler Arroyo Associates, Inc./
clearzoning
CLEAR AND CONNECTED

staff

Maria Maclean, Planning & Zoning Department | Keith Edwards, Township Superintendant

APPROVED BY THE PLANNING COMMISSION - AUGUST 1, 2013

Insert Resolution of Adoption

RESOLUTION OF ADOPTION

Charter Township of Grand Blanc Master Plan Amendment

By The Grand Blanc Township Planning Commission

WHEREAS, the Charter Township of Grand Blanc Planning Commission has the responsibility and is empowered by the Michigan Planning Enabling Act, PA33 of 2008, to make and approve a Master Plan for the physical development of the Township and to amend the Plan as needed from time-to-time, and

WHEREAS, the Charter Township of Grand Blanc has retained a professional planning consultant to assist the Planning Commission with the technical studies necessary to prepare the Master Plan amendment, and

WHEREAS, the Charter Township of Grand Blanc Planning Commission held a public hearing on the proposed new Master Plan on August 1, 2013 at the Grand Blanc Township Hall, and

WHEREAS, the Planning Commission finds that the new Master Plan amendment is necessary for the continued development and the appropriate redevelopment of the physical areas of the Charter Township of Grand Blanc, and

NOW THEREFORE BE IT RESOLVED that the Planning Commission of the Charter Township of Grand Blanc hereby approves and adopts this Master Plan Update, along with the text, maps, charts, graphs, and other descriptive materials contained in the Plan, and

BE IT FURTHER ORDERED, that an approved copy of the Master Plan amendment shall be transmitted to the Charter Township of Grand Blanc Township Board, the Genesee County Metropolitan Planning Commission, and the Planning Commissions of Holly Township, Atlas Township, Mundy Township, and the Cities of Burton and Grand Blanc.

Motion by Brown Supported by Hoffman

AYES: 8
NAYS: 0
ABSENT: 1

RESOLUTION DECLARED APOPTED THIS 1st DAY OF AUGUST 2013

_____

Secretary, Planning Commission
Charter Township of Grand Blanc

table of contents

APPROVED BY THE PLANNING COMMISSION - AUGUST 1, 2013

References

The Master Plan refers to studies, plans and reports completed in the last few years. Topics include zoning, sub-area plans, historic resources, transportation and economic development. All documents referenced in the Master Plan are available at the Grand Blanc Township Offices.

introduction

A community's Master Plan is a clear statement of local goals and objectives that sets the framework for the preferred course of future development. The Charter Township of Grand Blanc's Master Plan establishes a long range vision for the future extending 10 to 20 years out and includes implementation strategies to achieve that vision.

In July of 2010 the Township Board approved an updated Master Plan for the physical development of the Township. The plan included the review of existing conditions throughout the entire Township and fresh input from the public participation component. The planning process resulted in updated goals and objectives, future land use recommendations, action strategies and specific implementation steps.

Frequent review and analysis of the Master Plan will strengthen the relevance and validity of local planning and zoning policies.

The Master Plan implementation work is ongoing and often results in the need for plan amendments or more detailed sub-area plans. A Master Plan amendment to allow for the realization of a Technology Village Area planned for the south central portion of the Township is a key recommendation of the 2010 Master Plan implementation program. The Technology Village area, which is readily accessible and has the potential to develop into a high tech employment center with mixed use development, has been a significant economic development focus for the Township since the mid 2000's.

What is a Master Plan—and Why Prepare a Supplement to the Master Plan now?

The Master Plan is a working document; community decision makers need to be familiar with the vision, goals, and strategies of the Master Plan since it is the long-range guide for local land use implementation and decision making in the Township. The Master Plan does not change the zoning of property. However, the Plan does provide the basis upon which zoning decisions are made. State law requires that the Township's Zoning Ordinance be based on a plan designed to promote the public health, safety and general welfare. The local Zoning Ordinance establishes the classification and regulations for the use and development of land; it has the force of law. Zoning decisions consistent with an updated Master Plan are presumed by the courts to be valid.

The Michigan Planning Enabling Act, PA 33 of 2008 (MPEA) requires master plans to be reviewed at least every five years. Analysis of changing conditions, updated demographic data, and development trends within the community should be considered. Recent local development factors such as the planned expansion of the Genesys medical center and the proposed extension of Dort Highway to the south could significantly impact growth within the Township. Potential economic development opportunities from the newly established I-69 International Trade Corridor also support the need to reevaluate the Township's long range plans for the Technology Village Area.

Changing conditions in the Township, including expansion plans for the Genesys Health System, the proposed Dort Highway extension, the establishment of new economic development resources, and the availability of updated Census and demographic data provide some of the reasons for reexamination of the Technology Village planning efforts. This Master Plan amendment will revisit the Township's 2008 Technology Village Area Plan for the area located in south-central Grand Blanc which includes approximately 4,100 acres including land which will be involved in the Dort Highway Extension and the planned expansion of the Genesys Medical Center.

Technology Village Concept

The purpose of this Master Plan Supplement is to guide development of a technology-driven center that is attractive to both high-tech businesses and the Township's talented, young residents as employees for those businesses. To achieve this, the center must incorporate knowledge-based employment with recreation, culture, diversity and entertainment. A study for this area was completed in 2008 and is now being incorporated into the Master Plan as a supplement, in order to further its goals and objectives.

The Great Lakes region, State of Michigan, and local communities have long relied on the manufacturing industry as the foundation of their economies. As that sector continues to downsize, consolidate, and outsource, communities lose jobs and, one of their greatest resources, people. The region can not rely on the automotive industry returning as a major employment sector. To flourish economically, Michigan communities must position themselves to attract jobs of the future: jobs in the Knowledge Economy. Success in the Knowledge Economy is most likely to occur in places that are able to retain the educated workforce and recruit knowledge-based businesses that compete in the global marketplace.

While there are multiple actions to be taken at the State, regional and local levels to bring about change in Michigan, local governments like the Charter Township of Grand Blanc can do a great deal to move towards a more financially prosperous future. This was the impetus for the Technology Village Area Study in 2007: To create a community that competes in the knowledge economy and is therefore able to retain the human capital cultivated in the Grand Blanc community.

Technology Village Area Overview

Goal: Create a technology-driven center that is attractive to both high-tech businesses and the Township's talented, young residents as employees for those businesses.

To achieve this, the center must incorporate knowledge-based employment with recreation, culture, diversity and entertainment.

Area Assets

- Over 4,000 Acres
- Approximation 40% vacant
- I-75 frontage available
- 3 Freeway interchanges
- Genesys Regional Medical Center
- Water and Sewer Available
- CSX rail and MTA transit service
- I-69 International Corridor Next Michigan Development Corporation
- Proposed Dort Highway Extension to Baldwin Road

The Planning Process

Planning Commission review of existing conditions in the southwest portion of the Township, specifically focusing on the Technology Village Area, began in May 2012. A statement of intent was distributed as required by the Michigan Planning Enabling Act. Background information including updated demographics, available details regarding the proposed Dort Highway Expansion and changes in the Township's land use and development since the last update of the plan were prepared and analyzed.

The Township hosted a public input session on June 27, 2012, to receive input on existing conditions and plans for the Technology Village Area. Using information collected for the planning area as well as results from the public input session, updated goals and objectives were formulated. These goals and objectives were used to form the basis of the Future Land Use plan for the Technology Village Area. Key implementation items were identified and prioritized to provide Township decision makers with a roadmap for achieving the Township's vision and goals for the Technology Village Area.

Upon completion of a final draft the Planning Commission held a public hearing on August 1, 2013 to obtain additional public input. The Planning Commission approved the Master Plan on August 1, 2013 and recommended approval of the Master Plan to the Township Board. The Master Plan was adopted by the Township Board on ____.

Intentionally blank

background and existing conditions

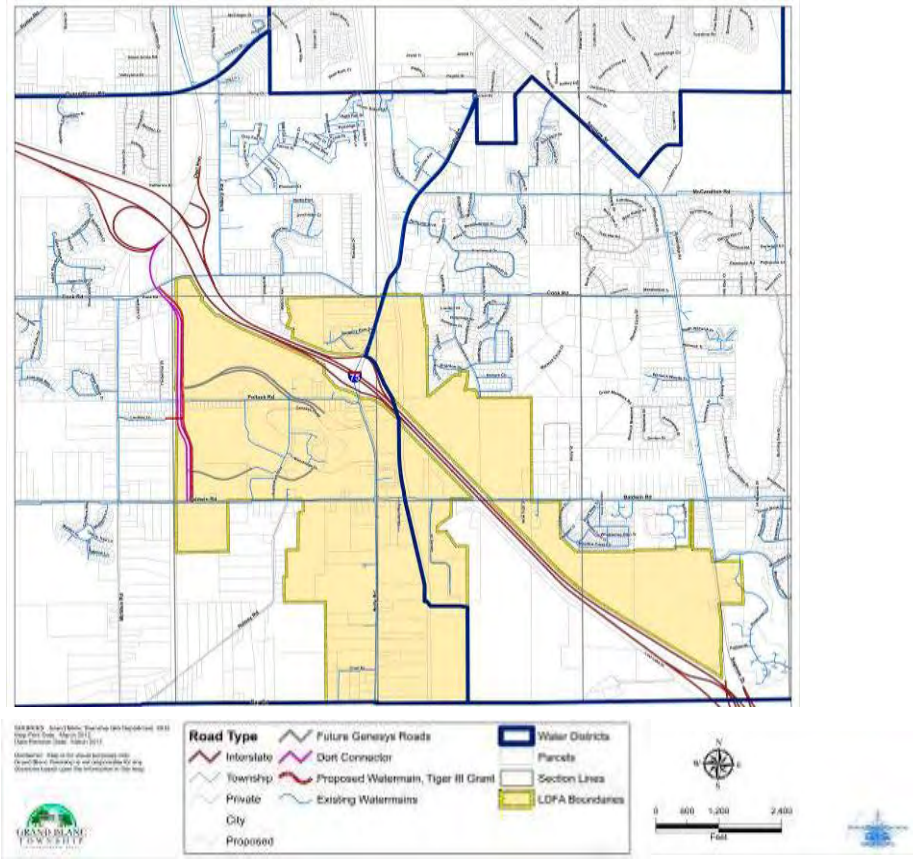
The Technology Village Area focuses on what communities need to provide to attract Knowledge Economy jobs, and how this area could optimize its strengths for the future.

"**Communities with the desired infrastructure, labor pool, amenities, quality of life and other factors can compete for the high-skilled, high-wage jobs in the knowledge economy.**"

- Michigan Knowledge Economy Index: A County Level Assessment of Michigan's Knowledge Economy (Michigan State University Center for Community and Economic Development)

Grand Blanc Township initiated the Technology Village concept in 2008 with the Technology Village Area Plan. The planning area consists of approximately 4,103 acres located in the south central portion of the Township (Figure B-1). The boundaries of the Technology Village Planning Area have been defined to encompass half of the Township's frontage along I-75. Property in this prime location has been master planned for future light industrial and research and development.

Figure B-1 Proposed Technology Village Area



Regional Access

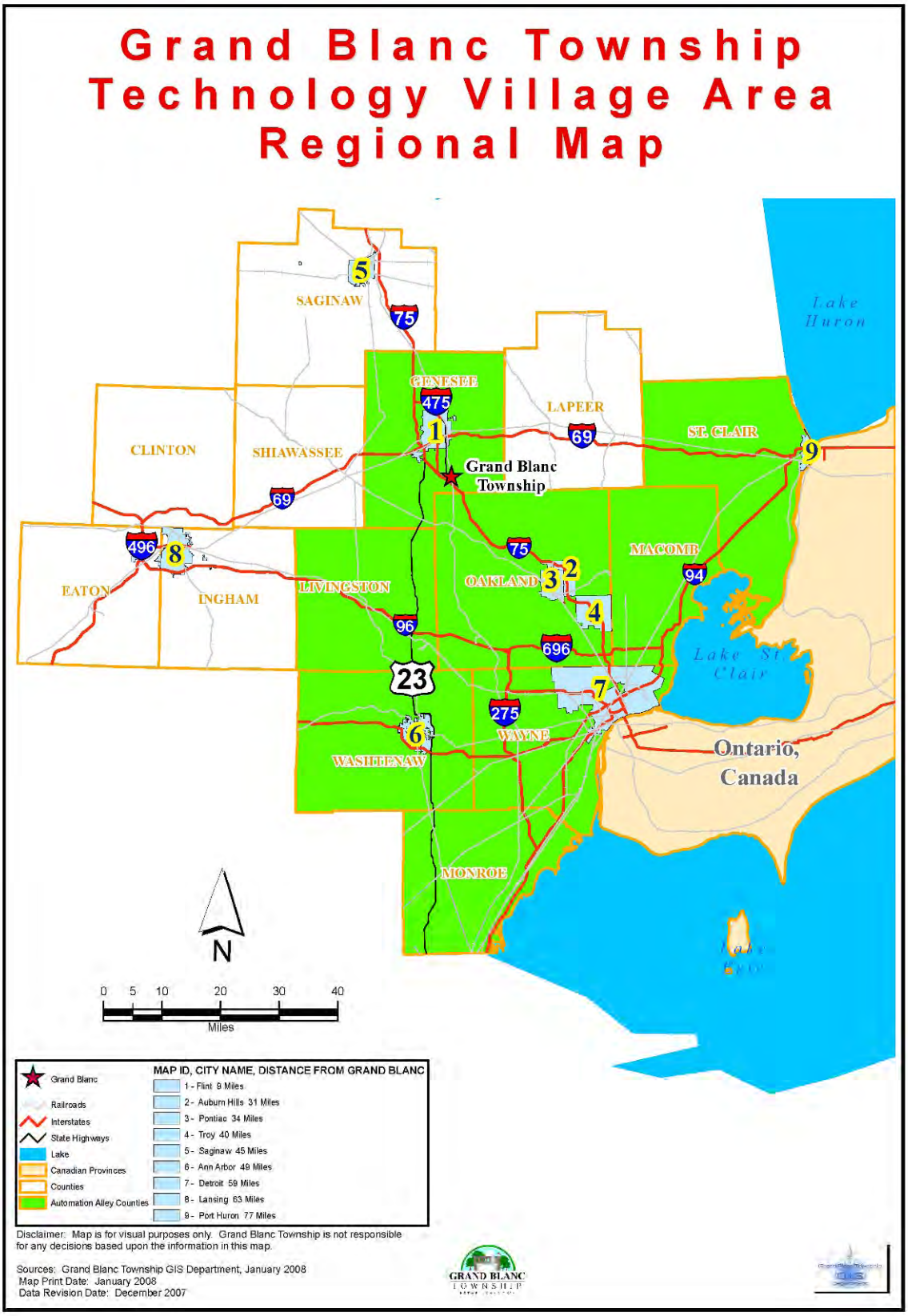
The Technology Village Area features exceptional regional accessibility. Interstate-75, which runs all the way from the Canadian border in Sault Ste. Marie to outside of Miami in southern Florida, travels through the southwest quadrant of the township and through the heart of the boundaries of the Technology Village. Approximately 50,000 to 70,000 vehicles travel through the Township on I-75 every day. Three I-75 interchanges are located within the township, and all three are either within or immediately adjacent to the boundaries of the Technology Village Area.

I-475 is a 17-mile loop that provides direct access to downtown Flint. It carries approximately 50,000 vehicles through the township and has an interchange at Hill Road in Grand Blanc Township's northwest corner. I-69, which runs from the Canadian border in Port Huron to Indianapolis, carries approximately 85,000 daily vehicles just north of the township. An extension of I-69 from Indianapolis all the way to the Mexican border in southern Texas is in the planning stages. If completed, this "NAFTA Highway" would create a direct link from Mexico to Canada that would run through Genesee County. Grand Blanc Township has access to I-69 via I-475 and Dort Highway.

As Figures B-2 and B-3 illustrate, in terms of regional and international highway access, Grand Blanc Township is literally at a crossroads of two of North America's most critical links. The availability of 1-75 frontage for development combined with excellent access translate into a geographic advantage for the Technology Village.

Figure B-2: Technology Village Area Access

Figure B-3: Technology Village Area Regional Map

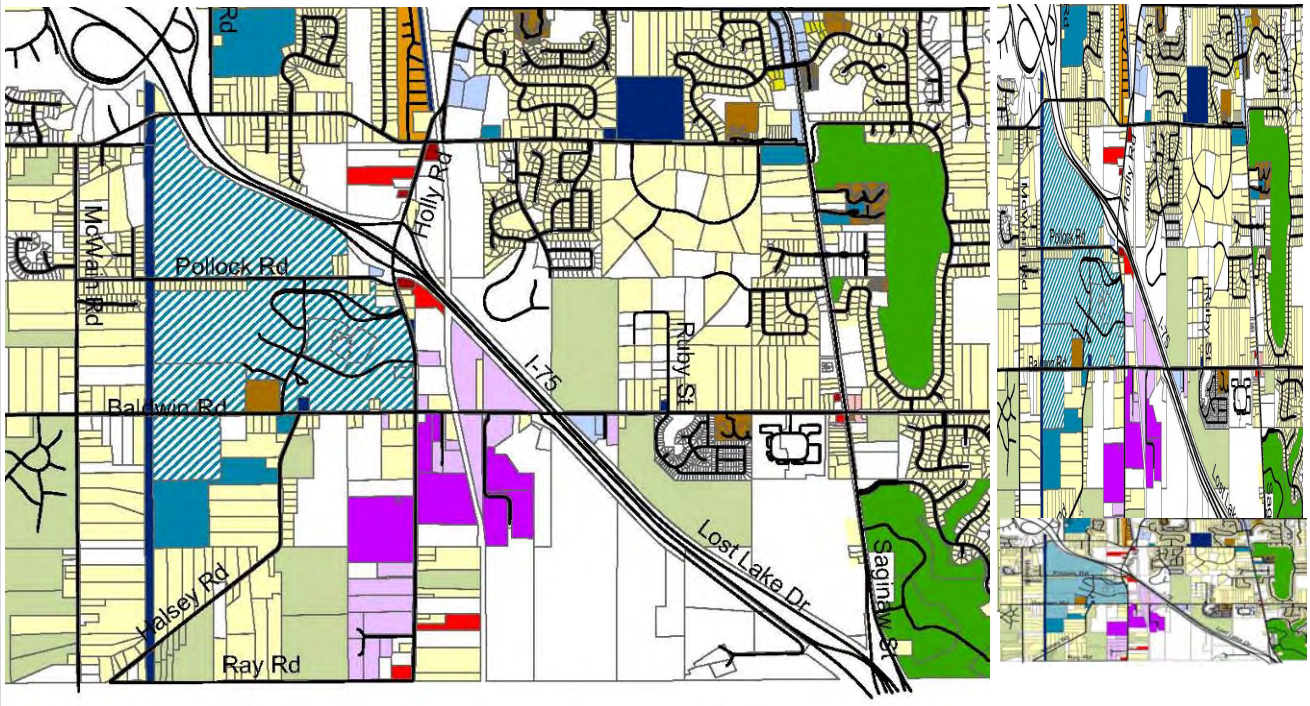


Planning Influences

Figure B-3 and Table B1, define the mix of land uses in the Technology Village Area. The integration of employment centers, multiple and single family residential, and commercial and recreation uses in a cohesive pattern is appropriate for a knowledge-economy center. Residential uses are generally located along Halsey, and the north side of Baldwin and McWain. Genesys Regional Medical Center comprises the majority of the northwestern portion of the Area. Industrial uses align the Holly Road corridor, primarily due to access to I-75. Nearly one-third of the total land area is vacant. There is great potential for this land to be planned in a manner that attracts knowledge-based businesses and employees prepared to work in the knowledge economy.

By encouraging the development of a technology-driven mixed use district the Technology Village Area plan supports the diversification of the Township's tax base. The Technology Village Area is planned as a center which will appeal to high-tech businesses as well as the talented knowledge based workforce who will want to live, work and play in the area.

Figure B-3: Existing Land Use
(Excerpt from Charter Township of Grand Blanc 2004 Master Plan with 2008 Updates)



Functional Road Classification System:

- Freeways are divided multi-lane highway facilities that handle large volumes of traffic moving at high speeds with improved safety.
- Arterials provide routes for through traffic while providing access to abutting properties and minor intersecting streets. Arterials typically accommodate daily traffic volumes up to 30,000 vehicles.
- Minor Arterials serve a similar function as arterials; however, these roads typically carry less traffic (traffic volumes up of 15,000 vehicles) over shorter distances than arterials.
- Collectors primarily permit direct access to abutting properties and provide connections to higher order roadways including minor and major arterials.
- Local Streets provide access to abutting land and consist of all facilities that do not belong to one of the higher systems. They offer the lowest level of mobility and may carry no through traffic.
- Natural Beauty Roads. This designation protects specific roads through the Natural Resources and Environmental Protection Act, Act 451 of 1994, which provides a mechanism to protect scenic roadways from further expansion or habitat destruction.

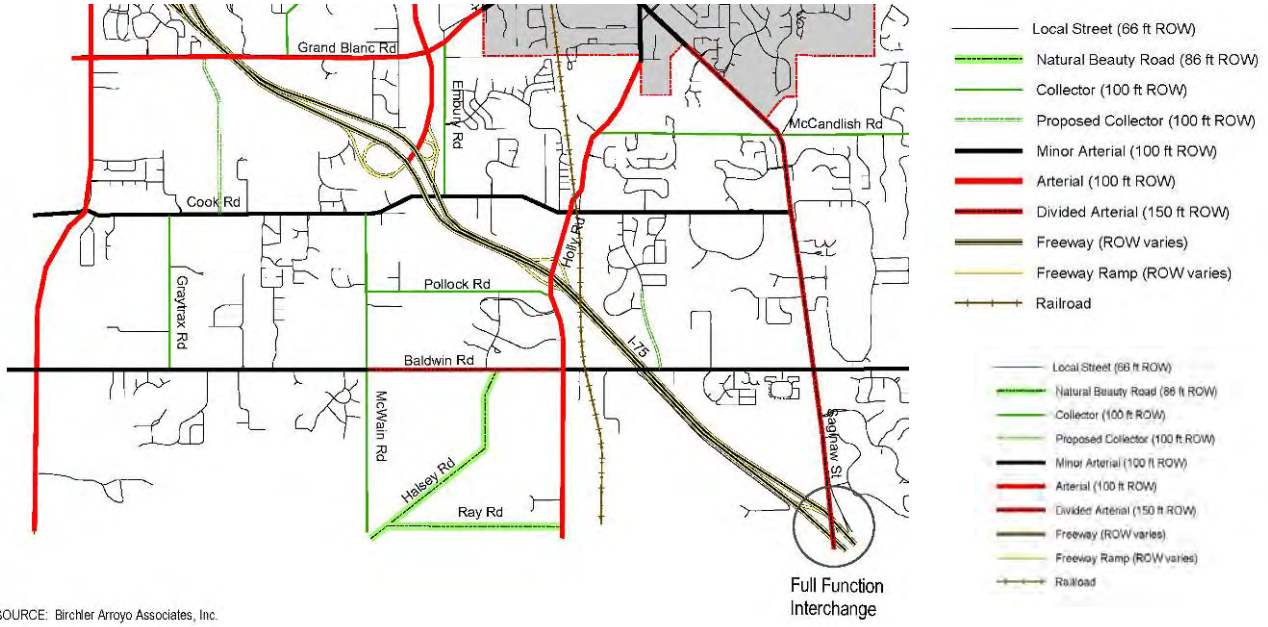
Table B-1.:Existing Land Uses in the Technology Village Area - 2008 Data

Land Use	No. of Parcels		Acreage	
	Total	Percent	Total	Percent
Agricultural Vacant	8	0.8%	291	7.1%
General Commercial	5	0.5%	24	0.6%
Heavy Commercial	4	0.4%	5	0.1%
Heavy Industrial	8	0.8%	106	2.6%
Hospital	5	0.5%	464	11.3%
Light Industrial	20	2.0%	122	3.0%
Multiple-Family Residential	62	6.2%	35	0.9%
Neighborhood Commercial	3	0.3%	3	0.1%
Office	3	0.3%	7	0.2%
Parks and Recreation	5	0.5%	549	13.4%
Public	8	0.8%	48	1.2%
Semi-Public	5	0.5%	61	1.5%
Single Family Residential	707	71.1%	1,062	25.9%
Vacant	152	15.3%	1,326	32.3%
Total	**995**	**100.0%**	**4,103**	**100.0%**

The anticipated expansion over the next several years of the Genesys Medical Center Campus, the Township's largest employer, has the potential to propel the Technology Village Area concept into a reality. The enlarged campus could include senior housing, retail, and health care industry related services.

The Charter Township of Grand Blanc's 2004 and 2010 Master Plans contain detailed information regarding the existing conditions of the Township, including natural features, socioeconomic characteristics, existing land use, community facilities, tax base analysis and thoroughfares. The following discussion is intended to summarize and highlight important findings from the plans that are related to the Technology Village Area Plan. All population and housing data is from the U.S. Census unless otherwise noted

Figure B-4: Existing Functional Classification System
(Excerpt from the Charter Township of Grand Blanc 2004 Master Plan)



Existing Transportation Conditions

Functional Classification System

The Grand Blanc community, and therefore the Technology Village Area, features regional and international accessibility via direct access to I-75 and close proximity to I-69 and US-23. Several road classifications exist within the boundaries of the Technology Village Area, as indicated in the Functional Classification System map of the Township's Thoroughfare Plan (Figure B-4). These include:

- **Freeway:** I-75 and two Freeway Ramps at Saginaw Street and Holly Road.
- **Arterials**: Saginaw Street and Holly Road.
- **Minor Arterial**: Baldwin Road.
- **Collectors**: Ray Road, Halsey Road, McWain Road, and Pollock Road. (Note: Ray Road & Halsey Road are also considered "Natural Beauty Roads.")

The remaining roads in this area are classified as Local Streets.

Existing Road Conditions

A transportation network associated with high-tech development should facilitate quick access and maneuverability. These principles apply to vehicle trips entering and existing the area, as well as to traffic movements within it.

The central and eastern sections of the Technology Village Area are readily accessible from freeway I-75, the five-lane Holly Road, and four-lane Saginaw Street. The Master Plan recommends expanding Holly

Road to five lanes from Baldwin Road and Ray Roads, and expanding Baldwin Road to a divided four lane road between McWain and Holly Roads. The Dort Highway extension to Baldwin Road, which has not previously been reflected on the Township's Thoroughfare Plan, is now being considered as part of this 2012 Master Plan update.

The two-lane gravel roads, which include McWain, Halsey and Ray, are the primary means of travel in the west and southwest areas of the Technology Village Area. Gravel roads are in areas likely to remain residential in character and should, therefore, not impede the Health Care and Technology Areas. Additionally, the skewed intersection (angle less than 90˚ or other unusual configurations) at Halsey and Baldwin is a design issue.

Traffic Volumes

A variety of factors determine traffic volume: roadway location and length, roadway condition and surface (paved vs. unpaved), and the quantity and type of adjacent land uses. Traffic volume is an important factor in determining the level of congestion. When traffic volume is compared with the overall capacity available on the roadway, the volume-to-capacity (V/C) ratio may be determined. The V/C ratio is a basis for determining the Level of Service (LOS) for the roadway. A LOS measurement can be applied to both intersections and road segments. The LOS is measured from LOS A through LOS F. Per the Genesee County Road Commission, an LOS measurement of LOS D through LOS F indicates roadway deficiencies exist that should undergo analysis in order to improve roadway function.

Figure B-6 presents the average daily traffic volumes within the Technology Village Area from 2010. The highest volumes occur on the freeway systems (I-475 and I-75). Saginaw Street and Holly Road have high traffic volumes, since they both provide access between I-75 and the City of Grand Blanc. The east-west roadway that carries the highest traffic volumes is Baldwin Road. Baldwin Road runs west-east for the entire length of the Township.

The Master Plan indicates that Holly Road, from I-75 to southern City limits, and Saginaw Street, from Baldwin to southern City limit are approaching capacity (LOS D) or are overcapacity (LOS E,F). Recommendations for mitigating congestion are included in the thoroughfare component of the Township's 2010 Master Plan.

Figure B-6: Average Daily Traffic Volumes (2010 Traffic Counts from Genesee County Road Commission)

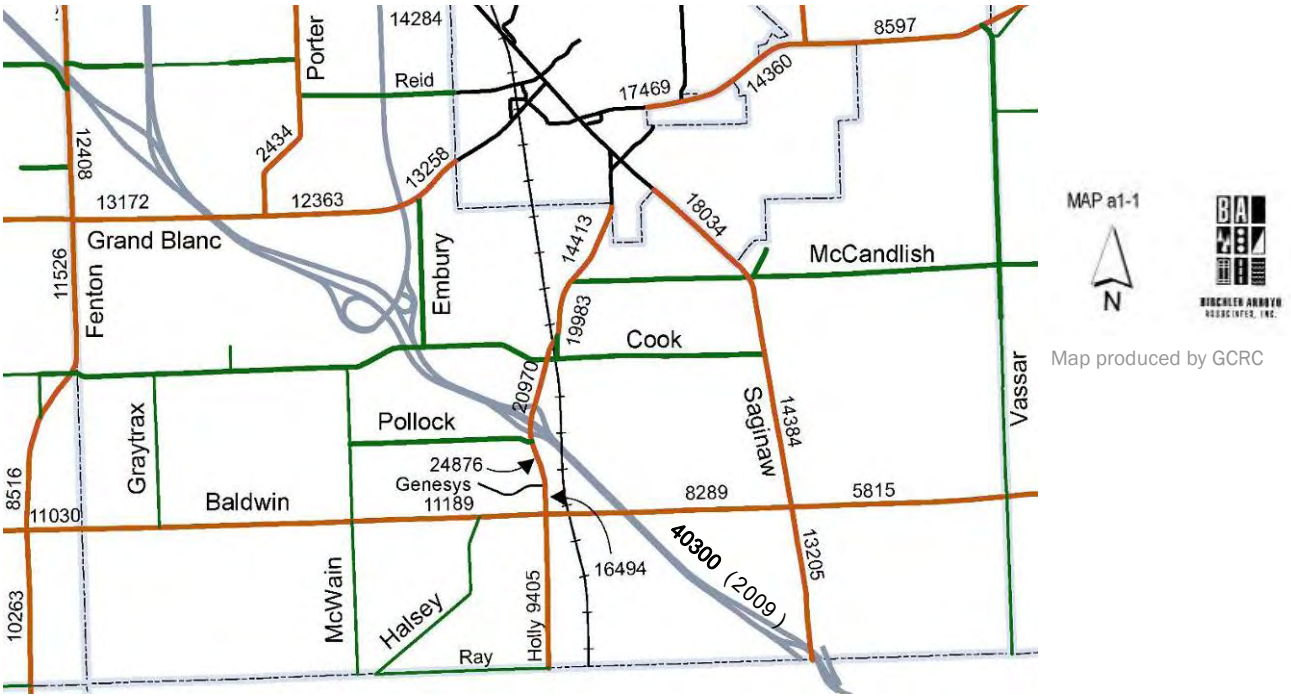
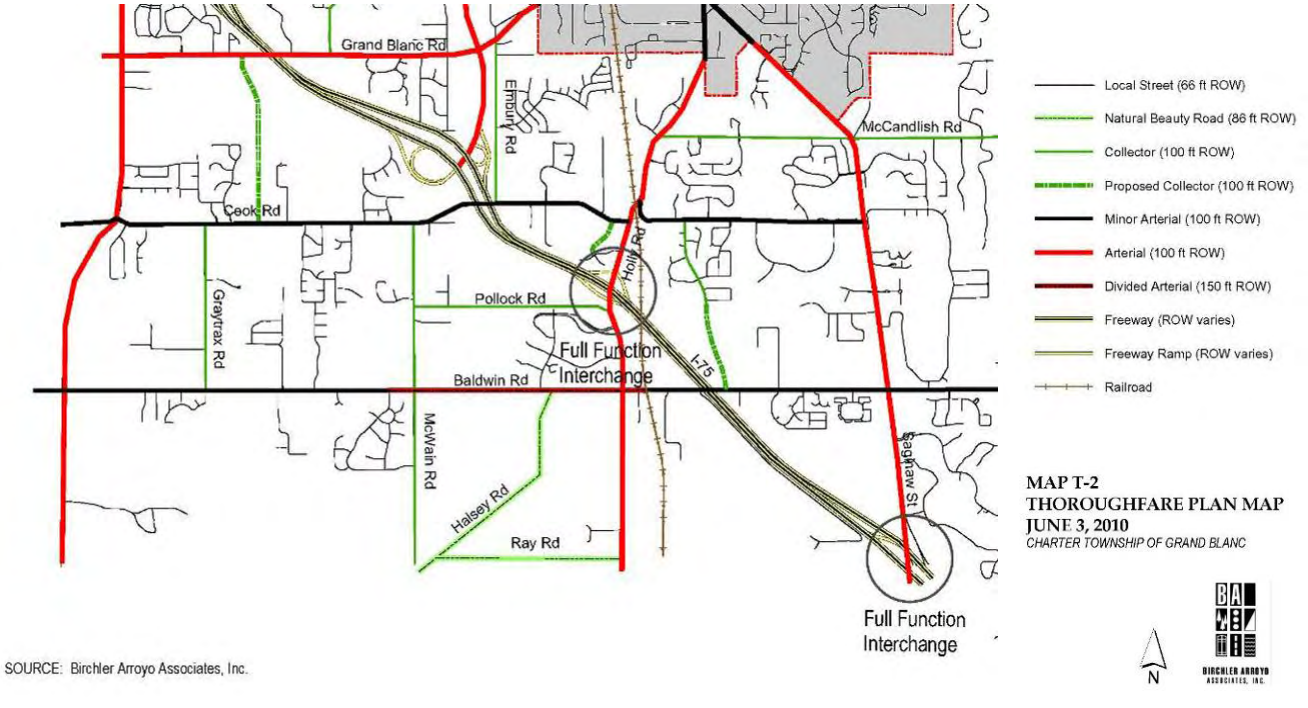


Figure B-7: Thoroughfare Plan (Excerpt from the 2010 Charter Township of Grand Blanc Master Plan)



Thoroughfare Plan

The Grand Blanc Township Master Plan includes a Thoroughfare Plan. The Plan indicates the classification of Grand Blanc roads for future road function. The classification applies to existing and proposed roads. Figure B-7 provides an excerpt from the Thoroughfare Plan. Road classifications that apply to the Technology Village Area are:

- Freeways. I-75 is the freeway that traverses the Technology Village Area.
- Arterials. Saginaw Street, Holly Road and Baldwin Road between McWain and Holly Roads are arterials in the Technology Village Area. The segment of Holly Road is planned to be a divided arterial.
- Minor Arterials. Baldwin and Cook Roads are the minor arterials in the Technology Village Area.
- Collectors. Examples of existing collector roads within the Technology Village Area are Pollack and McWain Road. An extension of Grand Avenue to Baldwin is part of the Thoroughfare Plan.
- Local Streets. Examples of this class of roadway are subdivision streets and cul-de-sacs
- Natural Beauty Roads. The Thoroughfare Plan identifies Ray and Halsey Roads as appropriate for receiving Natural Beauty Road designation.

The Township's Transportation Plan (March 2006) evaluated the township roadway system with respect to assets and conditions, safety, future traffic, non-motorized pathways and funding options. Traffic modeling indicated areas of future need which may require capacity increases and/or new connections. Findings were incorporated into the Thoroughfare Plan Element of the 2010 Master Plan update. The Genesee County Metropolitan Planning Commission's 2035 Long Range Transportation Plan (July 2009) has also been considered in the Township's thoroughfare planning. Master Plan recommendations that pertain to the Technology Village Area include:

Widenings / Expansions

Baldwin Road to four lane divided boulevard just west of McWain to just east of Holly Road.

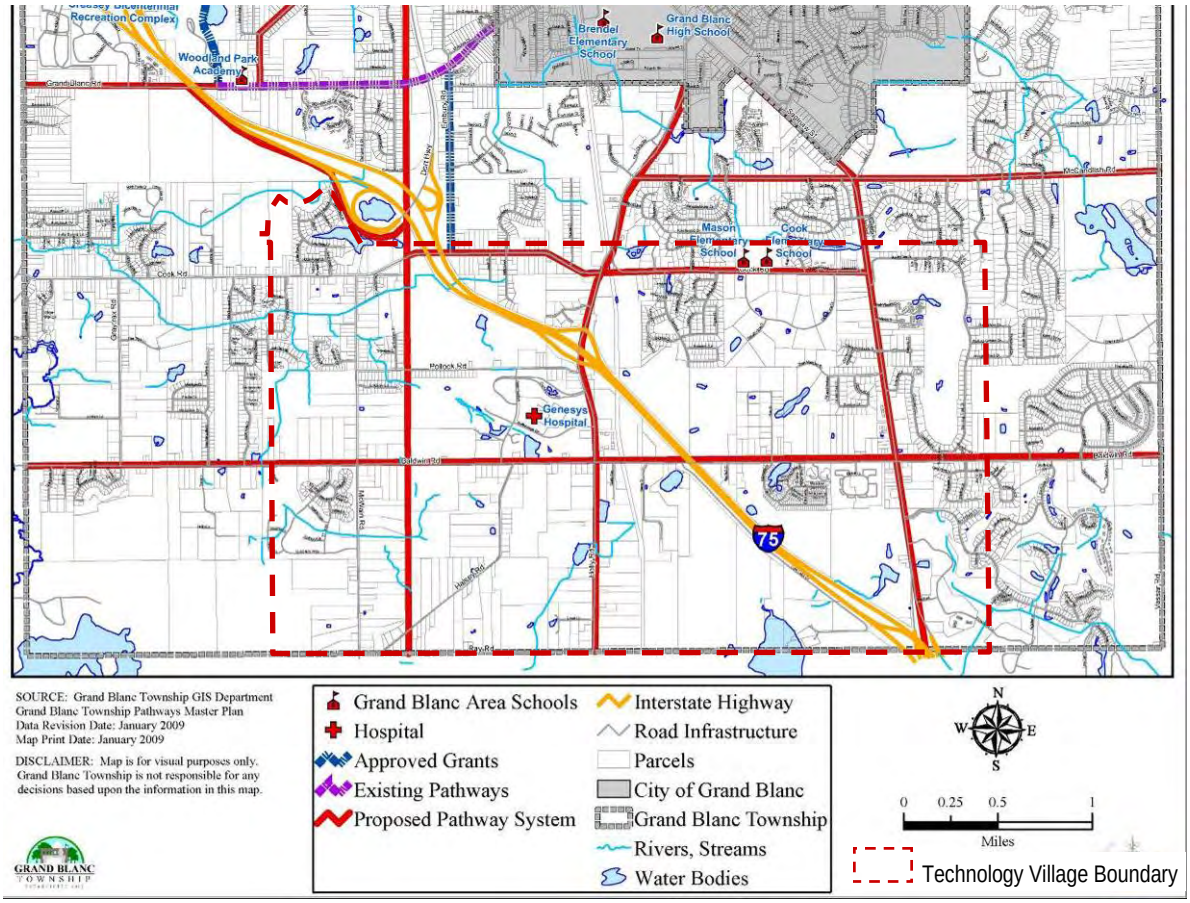
New Interchanges

- Full-function interchange at I-75 and Holly Road (May be appropriate as a Single-Point Urban Interchange (SPUI) due to the limited space available with the close proximity of the railroad tracks)
- Full function interchange at I-75 and Saginaw Street

New Roads and Extensions

- Extending Grand Avenue south to Baldwin Road
- Connector from Grand Blanc Road to Cook Road two lanes just east of Graytrax Road
- M-54 Dort Highway Extension

Figure B-11 :Non-Motorized Pathways
Excerpt of Grand Blanc Township Non-Motorized Capital Improvement Plan



Non-Motorized Transportation

Grand Blanc Township has adopted a Pathways Master Plan. At the time of the 2010 Master Plan update the only completed pathway was on the north side of Grand Blanc Road from the Bicentennial Park to the City of Grand Blanc's western boundary. There are currently 3.1 miles of trail at Genesys Health Park. In 2011, the Township celebrated the completion of the Bicentennial Park Pathway. The Baldwin Road bridge over the CSX railroad tracks was constructed to accommodate a future pathway along the south side of Baldwin Road.

Genesee County also has a Regional Trail Plan. A proposed trail along the Dort Highway extension will add to the Township's trail system providing increased non-motorized connectivity between township facilities. Planning for non-motorized pathways is intend to increase opportunities for multimodal transportation, a concept that will be central to the development of the Technology Village Area.

With the shift in focus from automotive to technology driven economic development and the provision of multimodal transportation options, the Township is supporting sustainability. The provision and use of trails

should minimize some of the traffic congestion and reduce the number of vehicles idling in the area resulting in improved air quality. Additionally the Township received an Energy Efficiency and Conservation Block Grant (EECBG) in 2009 for the installation of an electric vehicle charging station for public use at the MDOT Park and Ride Lot at Saginaw Road, exit number 106. The station was the first public electric charging station in Genesee County.

Electric Exit

The MDOT Park and Ride at the I-75 Holly Road interchange, Exit 108, was the County's first public electric charging station.

In addition to this station, two additional stations may be found in the Township: one at Al Serra Chevrolet and a second at the Insight Institute for Neurosurgery and Neuroscience on South Saginaw Street.

Plans for M-54 Dort Highway Extension

Plans to connect Dort Highway (M-54) from Hill Road south to Baldwin Road are moving to the preliminary engineering stages as of March 2013. M-54 is a state trunk line which is approximately 27 miles long that bypasses the city of Flint. The proposed extension of a four-lane boulevard along the western edge of the Genesys medical complex would benefit the Township by taking pressure off of Holly Road between Hill and Baldwin, which is currently carrying an estimated 21,000 vehicles daily.

The participation and support of Grand Blanc Township, Genesee County, Genesee County Road Commission (GCRC) and Genesys Health system should strengthen the federal grant application for the project which has the potential to generate jobs for the region. Federal funds are being sought through the Transportation Investment Generating Economic Recovery (TIGER) program. The Township has pledged support for water and sewer upgrades, Genesys has offered to donate 20 acres of land along with pledged funding from Genesee County and the GCRC. The Genesee County Road Commission is moving forward with the initial engineering work to advance the $23-million dollar project .

Connections to Regional Transportation Systems

The Grand Blanc Community and the Technology Village Area have access to international travel and shipping via Bishop International Airport, located nearby at the interchange of US-23 and I-75. The township and the Technology Village Area also have access to the regional MTA mass transit service via a route that travels to and from the hub in Flint along Saginaw Street and Holly Road and through the Genesys Health Park. Amtrak offers twice-daily passenger rail service from Toronto to Chicago via Flint (the Blue Water Line). The CSX railroad line also traverses the Township.

I-69 International Trade Corridor

The Next Michigan Development Act provides up to 5 Michigan regions with multimodal transportation hubs such as airports, rail lines and highways the opportunity to establish a designated area as an Aerotropolis or Next Michigan Development Corporation (NMDC). Approved NMDC's have the authority to use tax incentives to attract businesses that utilize multiple forms of transportation. In February of 2012, the I-69 International Trade Corridor was designated as the state's fourth Next Michigan Development Corporation by the Michigan Economic Development Corporation's Michigan Strategic Fund Board.

The I-69 Trade Corridor includes the creation of an Act 7 inter-local agreement between four counties, Genesee, Lapeer, St. Clair and Shiawassee. It is a regional collaborative partnership that includes agencies, businesses, and community leaders from 33 municipalities, and encompasses major transportation assets such as Bishop International Airport, CSX and Canadian National railways, the blue water bridge and multiple major highways along the corridor.

Together the 1-69 International Trade Corridor partners will market the region as a NMDC to attract businesses and other investments in the region. A governing board with representatives from each of the participating governments will recommend various tax incentives. Tax increment financing plans, renaissance zone designation, Michigan Economic Growth Authority (MEGA) tax credits and real and personal property tax abatements are some of the incentives available to qualifying businesses.

The NMDC does not have mandated state funding. Existing economic development agencies in the participating counties should benefit from the collaborative efforts of the NMDC. The 1-69 International Trade Corridor will provide additional opportunities for Grand Blanc Township's Technology Village Area to attract businesses and investment with the enhanced marketing of the region's multi modal access resources and economic incentives for development.

Next Michigan Development Corporation
I -69 Trade Corridor

In February of 2012, the I-69 Trade Corridor was designated as a Next Michigan Development Corporation. (NMDC)

Genesee, Lapeer, St. Clair and Shiawassee counties are partners in the I-69 NMDC.

The I-69 Corridor NMDC can now offer economic incentives to businesses utilizing multiple forms of transportation, provided that they locate near major transportation facilities.

Existing Community Facilities

Regional Facilities

There are many educational, medical, cultural and recreational opportunities in the region that create the dynamic environment to attract knowledge-economy businesses and professionals (Figure B-8). The City of Flint and Flint Township are home to several colleges and universities: Mott Community College; Kettering University; the University of Michigan-Flint; Baker College; and Davenport University-Flint.. By providing high-quality, accessible educational opportunities for students, and continuing education opportunities for professionals, these institutions are developing a local knowledge-based work force. Other significant contributors to regional employment, culture and entertainment include Genesys Health Park, McLaren Regional Medical Center, Hurley Medical Center, Flint Convention and Visitor's Bureau and International Institute, Perani Arena and Events Center, and the City of Flint Cultural Center, Institute of Arts, Public Library, Youth Theater, Longway Planetarium, Whiting Auditorium, Slone Museum, Children's Museum, and Farmer's Market.

Figure B-8: Regional Facilities in Southern Genesee County near Technology Village Area

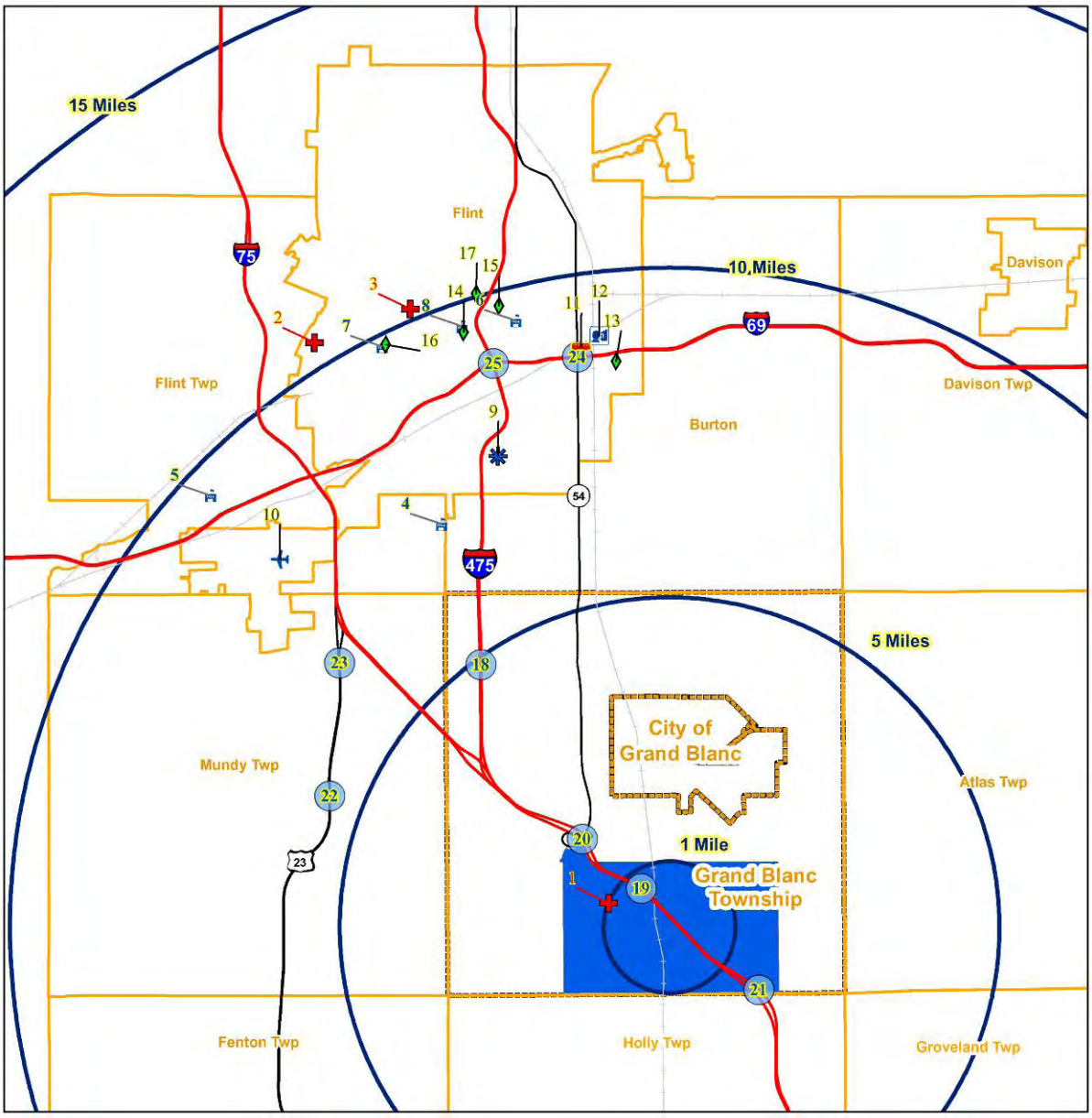
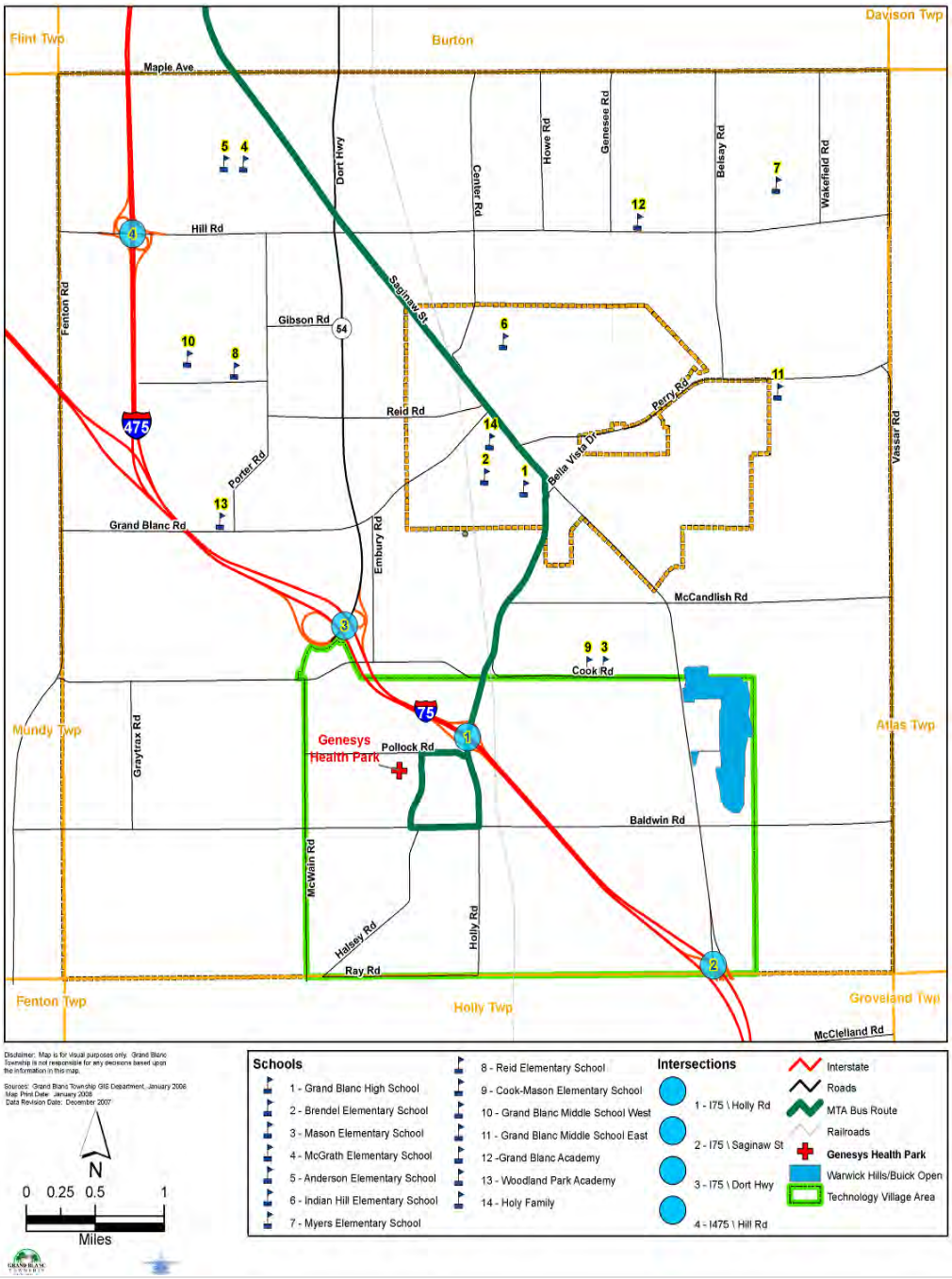


Figure B-9: Grand Blanc Township Facilities



The quality and availability of community facilities and services is essential to retaining existing residents and businesses and attracting new ones.

The Technology Village Area has access to high quality regional and local facilities such as parks, recreation venues, schools, the Genesys Health Park and libraries.

(Figure B-9)

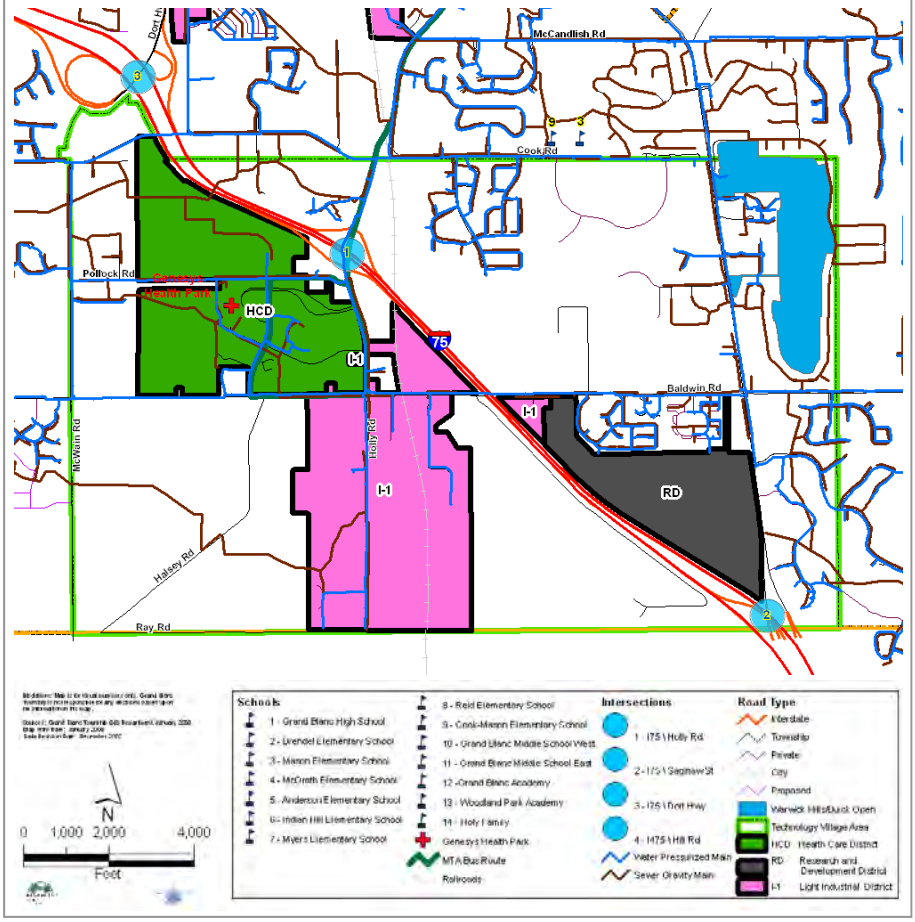
Township Facilities

Grand Blanc Township offers a variety of public and private resources that contribute to its reputation as a desirable community to live, work and play. The resources are detailed in the Township's 2010 Master Plan, and shown on Figure B-8. A brief summary includes: Public services (police, fire, medical); water, sewer and stormwater management; library; schools; recreational facilities, such as parks, the Senior Citizen's Center, and the Creasey Bicentennial Recreation Complex; and the Historic Museum and designated historical sites.

Development concepts for the expansion of the Genesys Regional Medical Center Campus include:

- Research & Development, Senior Living, Ambulatory Care, Retail, Educational & Conference components.
- Expansion of the Genesys Campus will add to the existing amenities in the Technology Village Area.
- There is ample opportunity for a mix of development within the 4,100 acre Technology Village Area.

Figure B-10 :Technology Village Facilities



Technology Village Area Facilities

Regional and Township facilities provide the external factors necessary to support a 'technology village' concept. However, the Township targeted this 4,100-acre area for high-tech development due to the amenities located within its borders. One of the dominant existing uses that is consistent with the technology village concept is the Genesys Health Park. This institution provides critical health care services in its medical campus. In addition to medical facilities, such as the hospital with an emergency trauma center, heart institute, family birthing center, sports medicine facility, convalescent center and hospice care, Genesys also has a state-of-the-art learning institute and conference center.

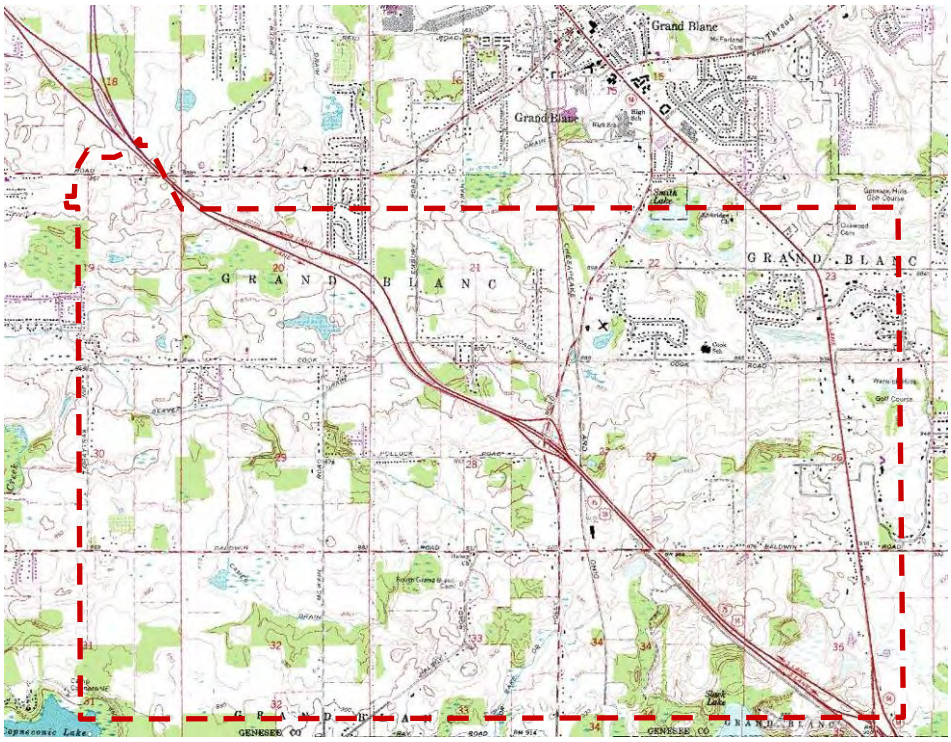
Other attributes that make this area desirable to development are the availability of water and sewer services to facilitate new development. Currently, significant sections of the Technology Village Area are zoned for Light Industrial and Research and Development uses (Figure B-10).

Natural Features

Topography

Grand Blanc Township lies within an area that was covered and uncovered by glaciers as ice ages came and went. The glacial activity resulted in the Township's relatively level plains and gently rolling hills. Grand Blanc topography varies by about 210 feet from the lowest point to the highest point. The lowest areas of 790 feet above sea level are located in the northwest corner of the Township, and the highest point of 1,000 feet is located in the southeast corner of the Township near I-75. Figure B-12 shows an excerpt from the Master Plan which illustrates the topography in and around Technology Village.

Figure B-12: Topography
(USGS 2011)

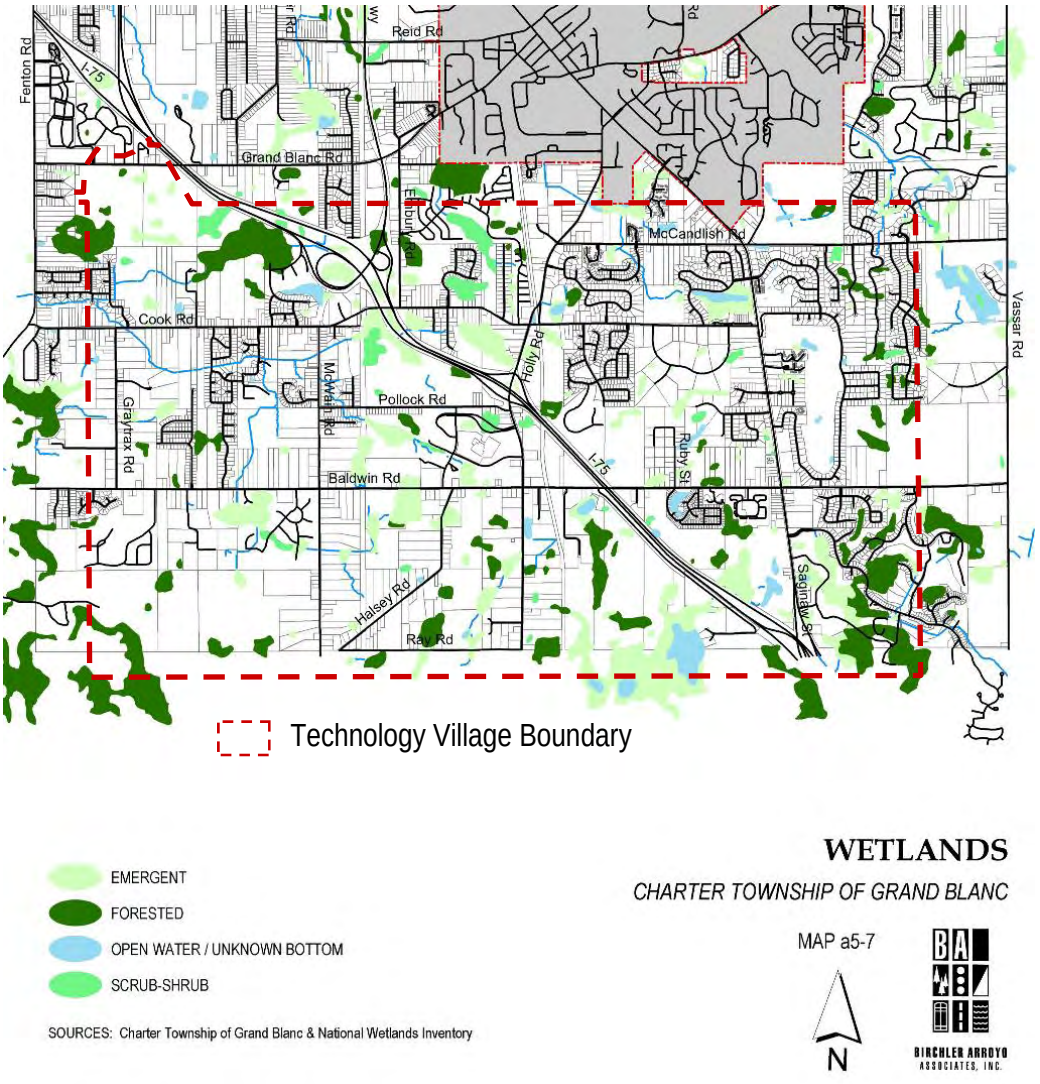


Technology Village Boundary (approx)

Wetlands

Wetlands are valuable natural resources. They may serve as storm water holding areas to reduce flooding; provide for the settling of sediments and pollutants from surface water runoff; reduce stream bank erosion caused by storm water runoff; and provide unique habitat for plants, fish and wildlife. The preservation and incorporation of natural features in site planning can enhance the overall design often resulting in a more desirable development. As illustrated on Figure B-13, there are emergent, scrub-shrub and forested wetlands in the Technology Village Area. Those which are five acres or more, as well as smaller wetlands hydrologically connected to large wetlands, fall under the jurisdiction of the Michigan Department of Environmental Quality. However, Grand Blanc Township is best positioned to ensure that wetlands and other natural features are incorporated into the site design as development occurs in this area.

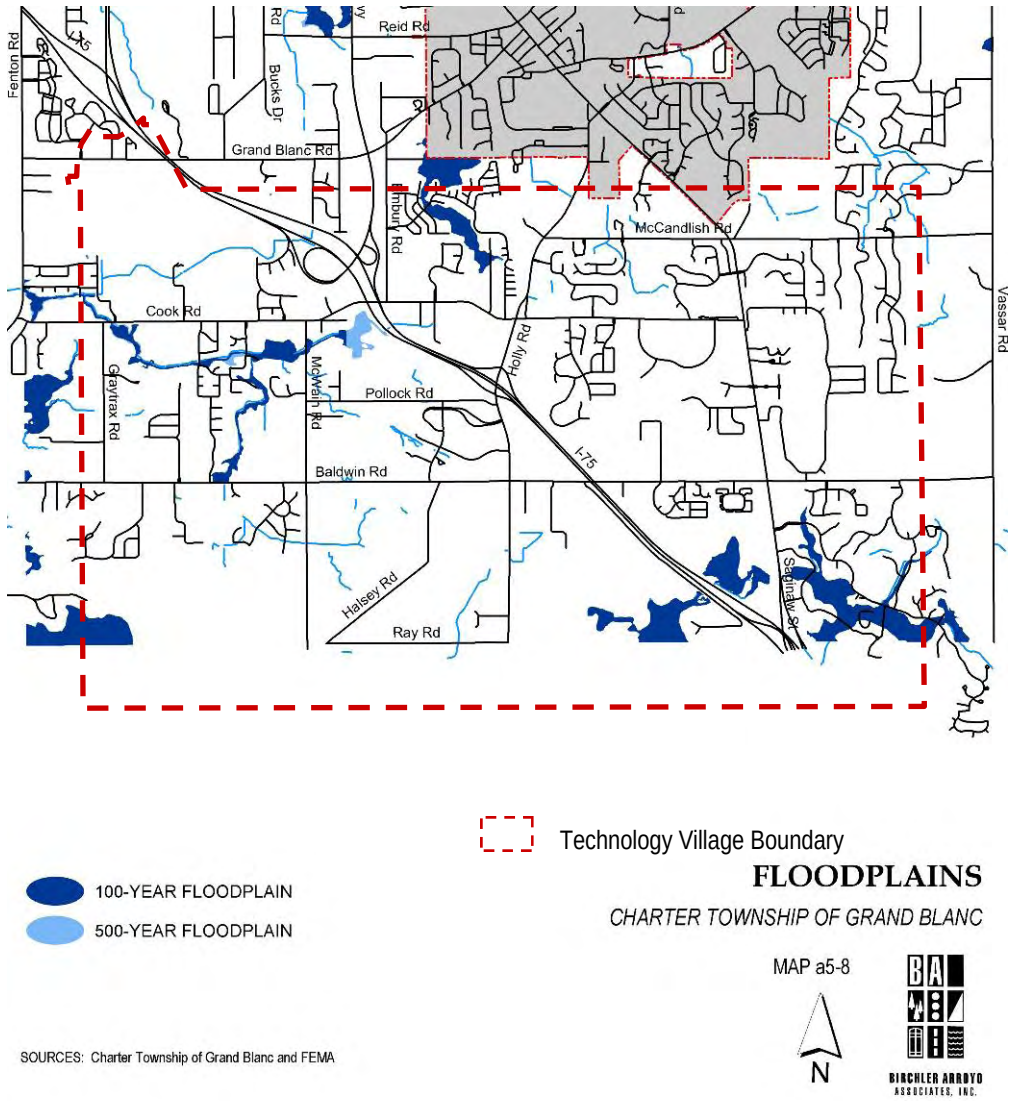
Figure B-13: Wetlands
(Excerpt from the Charter Township of Grand Blanc 2004 Master Plan)



Floodplains

Knowing the extent of flood-prone areas is critical when planning an area. While floodplains can serve as great viewsheds and provide attractive areas for parkland or open space, development should be strictly limited within the floodplain so that the floodplain does not expand beyond current levels. As indicated on Figure 14, the northwest and southeast areas of the Technology Village Area fall within 100-year and 200-year floodplains. The risk of flood in these areas is not as high, but the floodplain status should still be taken into account when making planning decisions.

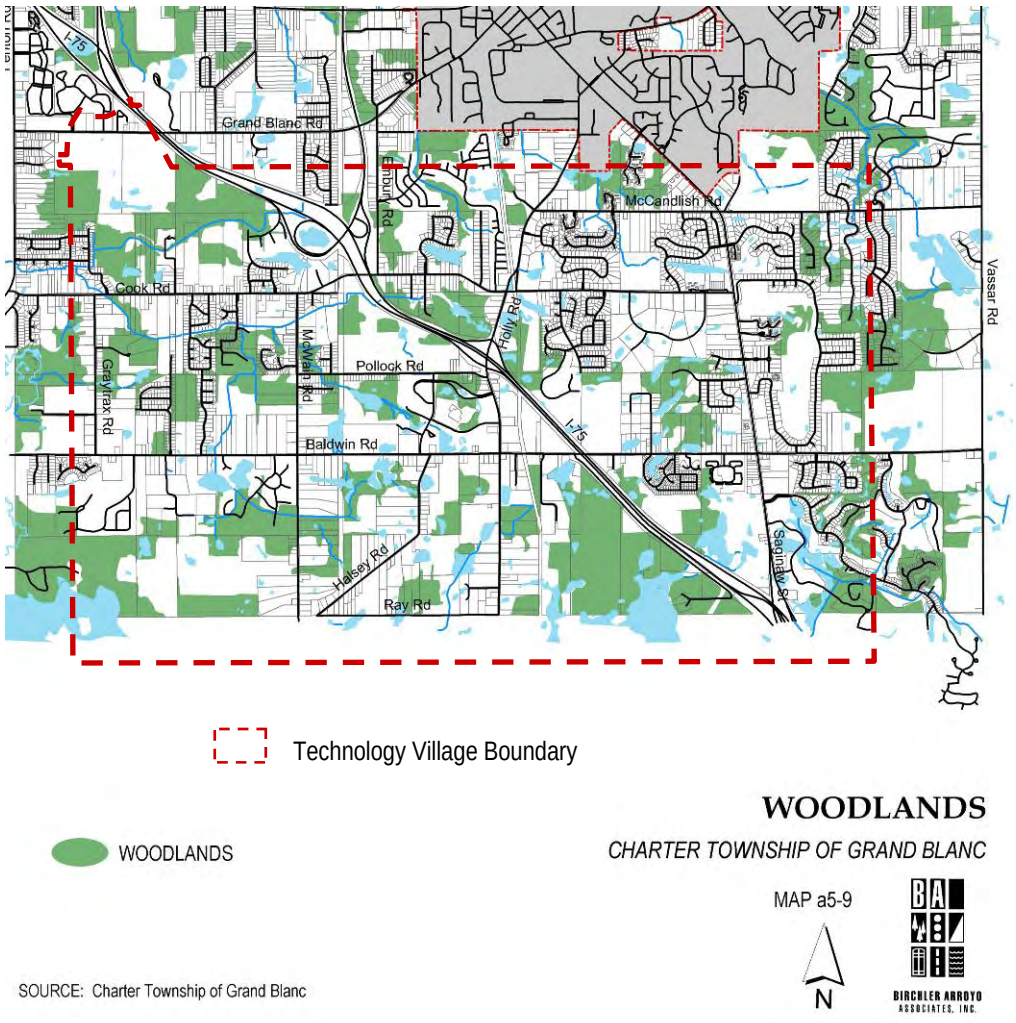
Figure B-14:Floodplains
(Excerpt from the Charter Township of Grand Blanc 2004 Master Plan)



Woodlands

Prior to settlement of southeast Michigan, the area that is now Grand Blanc Township was almost entirely covered by forests. After almost two centuries of agricultural development the woodlands in the Township cover a much smaller area. Still, the remaining woodlands are valuable natural features which serve as windbreaks, aid in the absorption of rainwater, replenish oxygen, create natural beauty and character, and provide wildlife habitat. In the Technology Village Area, woodlands are scattered throughout, with a concentration located on vacant parcels south of I-75 (Figure B-15). Effort should be made to incorporate the woodlands into the site design and/or the effects of development on existing woodlands in the Technology Village Area should be minimized.

Figure B-15: Woodlands
(Excerpt from the Charter Township of Grand Blanc 2004 Master Plan)



Population and Housing

According to the U.S. Census, Grand Blanc Township had a population of 37,508 in 2010, a 26 percent increase in population since 2000 (see Figure B-16). This population growth is in contrast to the two percent population loss Genesee County experienced over the same time period. If current growth trends continue, Genesee County Metropolitan Planning Commission (GCMPC) forecasts the Township's population to exceed 40,000 by 2020 with the potential to reach 44,399 by 2035.

As noted in the 2010 Master Plan the largest age group in the Township has traditionally been the family formation group (ages 20-44 years). The Township's population is continuing to increase in age consistent with national trends. Census data indicates that between 2000 and 2010, the family formation group experienced a decrease of four percent, while the empty nest group (ages 45-64 years) experienced a one percent increase. It is important to note that while the Township's population will likely continue to age, the pre-school/school-aged group (ages 0-19 years) had a 1% increase. Closer examination of the population figures demonstrates that the pre-school / school aged group together with the family formation group comprise over half of the total population. This is an indicator that the Township continues to be an attractive location for families.

Figure B-16: Population Growth from 1980-2010
Source: U.S. Census 2000 and 2010

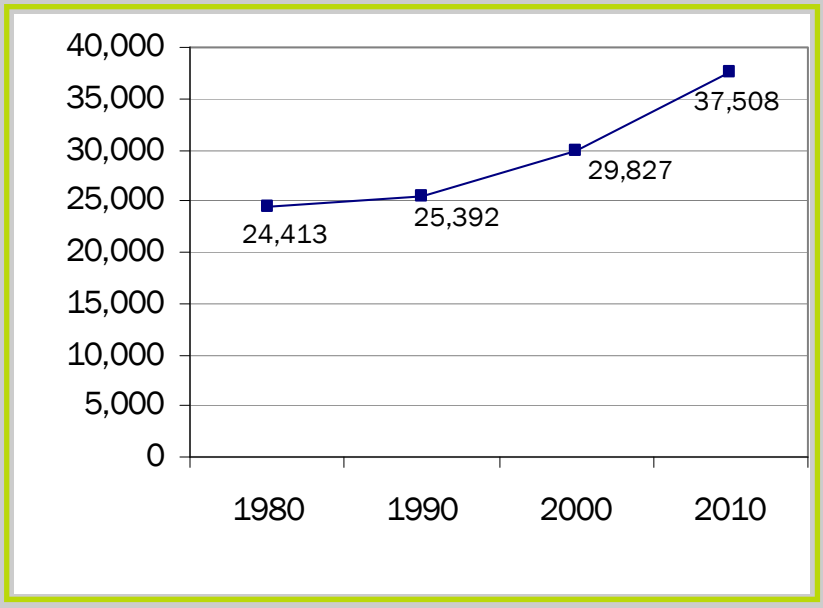
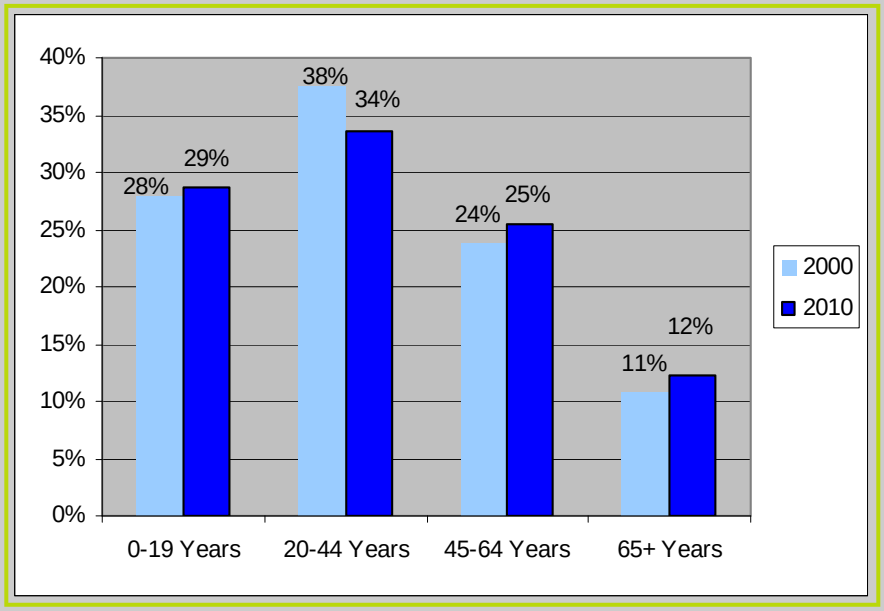


Figure B-17: Grand Blanc Township Population by Age.
Source: U.S. Census 2000 and 2010



Recent Economic and Employment Developments

The national economy is attempting to recover from the economic turmoil which has had a major impact on housing and employment. Communities in Michigan are slowly experiencing growth in the form of jobs and new development. The Township's dedication to the master plan process during these difficult times allows decision makers an opportunity to continue to move forward with innovative plans for development in preparation for the rebound of our regional economy.

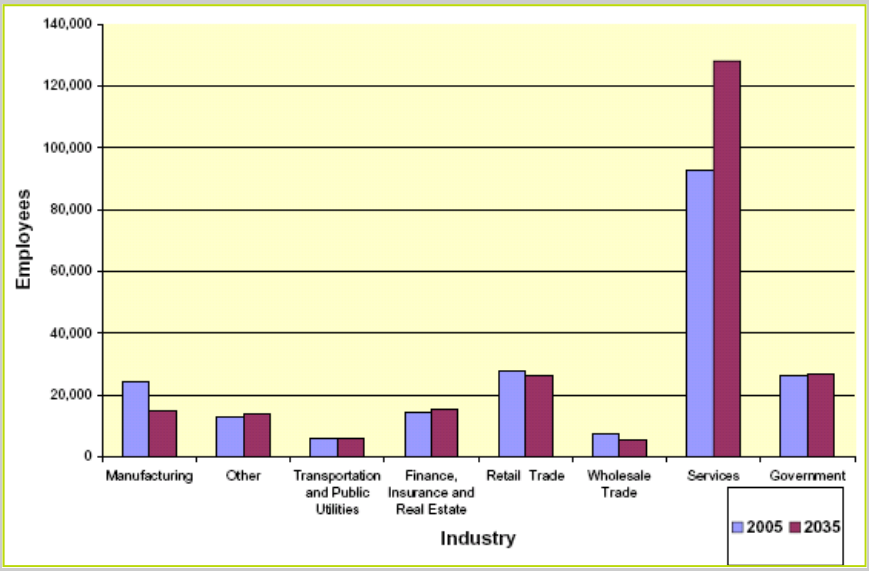
The employment sectors most negatively affected by the recent economic downturn include manufacturing, particularly automotive and other durable goods, trade, transportation and utilities, and professional and business services which have all exhibited substantial declines in employment Healthcare and educational employment sectors actually experienced increases in the number of jobs. The State of Michigan estimates that manufacturing jobs will continue to decline by seven percent over the next seven years and Genesee County projects a 40 percent loss in manufacturing jobs within the county over the next 25 years. Wholesale and retail trades are also expected to experience a job loss of about one percent over the same time period.

Unemployment rates for Grand Blanc Township have in the past and continue to be less than that experienced at the County and State levels. According to the Bureau of labor Statistics Genesee County unemployment rates have declined from 17.6% at time of the 2010 Master Plan to 9.1% for December 2012. The 15% rate of unemployment reported for the State in the 2010 Master Plan has improved to 8.9% (Dec 2012). National unemployment rates are

steadily decreasing with a 7.9% rate noted for January 2013. Using unemployment figures as an indicator for economic health, it appears that our economy is on the mend. The Township's 2012 unemployment rate is significantly better than the State and National rate at 4.7%. (Source: Michigan Department of Technology, Management, and Budget).

Top employers in the County include General Motors, Genesys Health System, McLaren Medical Center, Hurley Medical Center and County and local governments. As jobs are lost in automotive and manufacturing, gains can be expected within the major healthcare facilities in the County. Fortunately, Grand Blanc Township is home to one of the top employers in the County, Genesys Health Systems, and one within an industry sector that is projected to grow. The Township will need to focus on dealing with the decline of manufacturing within the community and planning for growth in the healthcare, education and service industries. Genesee County has set its focus on education and medicine (Eds and Meds) to reinvent itself in the changing economy. The continued growth and expansion of higher education facilities and hospitals within the county is critical to generating employment and attracting a well educated work force. Efforts at the county level are supportive of and should assist the Township in the realization of the Technology Village Area.

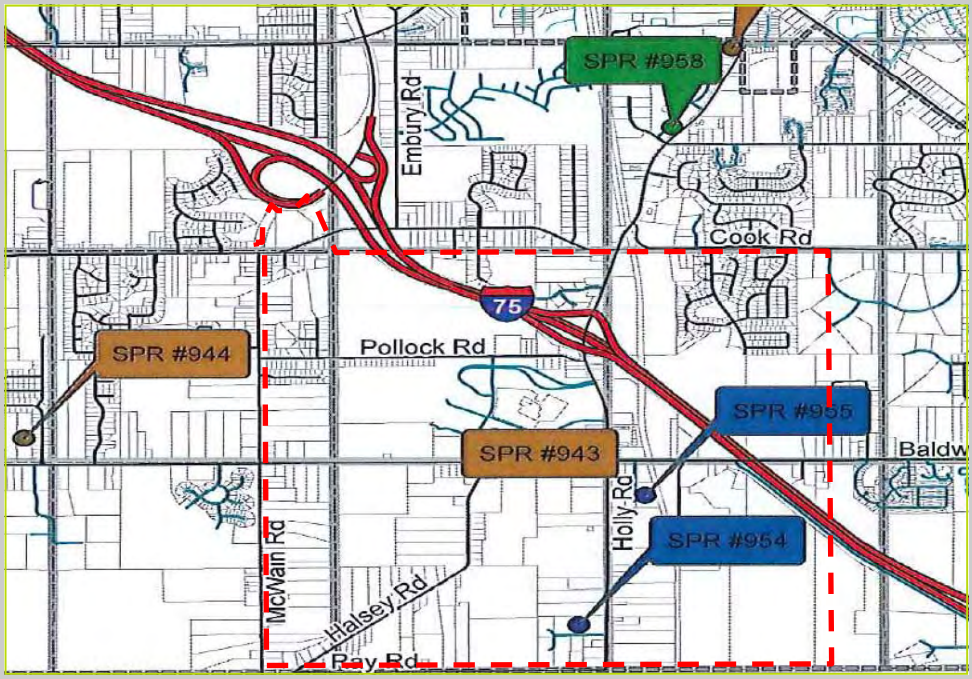
Figure B-18: 2005 - 2035 Genesee County Employment by Industry
Source: GCMPC *2035 Employment Projections*



Recent Development

Another indicator that the economy is on the mend is an increase in total building permits for Grand Blanc Township. Total building permits increased 8% from 2010 to 2011, the first increase in permits since 2007. The Township is embracing the Technology Village Area concept with the expansion of the Magna Electronics Company's facilities. The production of Lithium Batteries at the Magna Plant will bring green jobs and support innovative clean energy. Figure B-19 below identifies site plan and development activity from 2010-2012.

Figure B-19:
Grand Blanc Township Excerpt of Site Plan Review Cases 2010-2012
Map Source: Grand Blanc Township GIS



SPR 943 Halsey United Methodist Addition
SPR 954 Magna Electric
SPR 955 TMI Inc.

Technology Village Boundary

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goals and objectives

Charter Township of Grand Blanc Technology Village Area Plan – Symposium
November 7, 2007
-Speakers and Topics-

The Diagnostic Picture of the Great Lakes Region - John C. Austin, Senior Fellow, Brookings Institution.

The Knowledge Economy Report - Faron Supanich-Goldner – Michigan State University, Center for Community and Economic Development.

Emerging Business Sectors - Maureen Donohue Krauss, Deputy Director, Oakland County Department of Economic Development & Community Affairs.

Attracting National and International Business to Southeastern Michigan - Thomas Anderson, Ph. D, MBA, Senior Director, Automation Alley.

Economic Development in Genesee County - Edward Donovan, Genesee Regional Chamber of Commerce.

The Grand Blanc Township Technology Village Area Plan - Rodney Arroyo, Vice President, Birchler Arroyo Associates, Inc.

The Future of Health Care - Michael H. James, J.D., President, Genesys Ambulatory Health Network.

The Genesys Learning Institute - Norma Hagenow, RN, MBA, Chief Learning Officer, President Emeritus, Genesys Health System.

Intermodal Transportation Center - James Rice, Airport Director, Bishop International Airport Authority.

Introducing Hybrids - Cleaner Air, Brighter Future - Robert Foy, General Manager, Mass Transportation Authority, Flint

The concept of a Technology Village Area was indirectly influenced by the visioning process of the 2004 Master Plan update. The General Land Use Goals of the 2004 plan specified that Research and Development uses will be encouraged in appropriate locations within the community. Land Use recommendations and Action items related to this in 2004 included but were not limited to:

- Promote light industrial parks to attract high technology and biotechnology firms to the community.
- Plan for Research and Development Park of a Sufficient Size and Location to Attract Viable R&D Users which will Further the Employment Opportunities in the Community.
- Promote partnerships with local universities and colleges, the Michigan Economic Development Corporation (MEDC) and other agencies to attract technology firms to the Grand Blanc community.
- Create an economic development program to promote the area to R&D users and to coordinate marketing efforts with the County and universities.

In 2007 Grand Blanc Township hosted a symposium to gauge interest in the Technology Village Concept. The symposium attracted an estimated 120 participants representing various groups and interests from the Township, neighboring communities and Genesee County. A list of speakers and topics is noted at left. Participants were asked to describe their area of level interest on the Technology Village concept as well as who they were representing.

Public Input Overview: 2008-present

On **May 15, 2008**, the Grand Blanc Township Planning Commission hosted a special meeting to obtain input on the concept of a Technology Village Area for Grand Blanc Township. Approximately fifty people participated in the workshop, representing the Township residents, businesses, Township officials, and development interests.

The workshop began with a brief presentation of a technology village concept, examples of successful villages in the nation, and its potential location along the I-75 corridor in the Township. Participants were divided into several teams and asked to respond to questions regarding assets required to support a village concept and appropriate steps necessary to accomplish this vision in Grand Blanc Township. Each team reported their comments to the whole group.

There was mixed response from the groups with regard to the Technology Village concept. The majority of the groups were in agreement. Support for the Technology Village concept included:

- Genesys Medical Center's presence serves as an ideal anchor upon which the village concept can build.
- The current zoning (industrial, research and development and medical campus) is ideal for a technology village area.
- The timing is appropriate in terms of planning initiatives that bring jobs to Michigan.
- The research and development uses can precipitate a vibrant community and draw universities and colleges to the area.
- This type of concept is key to the future of Michigan.
- The regional transportation network is excellent for this type of concept (air, highway, rail).
- Ideal location due to the amount of vacant land, sewer and water availability, and exposure to I-75.
- Excellent police and fire departments.
- Excellent education system.

Members in the other groups supported the concept, disagreed with the concept, or were hesitant to be in agreement due to concerns. Some were concerned about the impact on the rural character of the south-central portion of the Township, and the preservation of open space. Others questioned whether the village would either bring too much retail to the Township, or questioned whether the type of retail would attract people as intended. Crime, people leaving the State, and the pressure to develop [as an impetus for the village concept] were other issues cited by participants.

Participants were asked to identify key assets required to bring people and business to a Technology Village. Responses included:

- Provide recreational opportunities
- Offer tax breaks
- Lower sewer and water tap-in fees
- Ensure quality development

Technology Village Vision 2008

Grand Blanc Township aspires to create a Technology Village that will be known as a thriving 'New Economy' center. It will be a place where people desire to work, live and play.

Its vibrancy will also serve to attract young people educated in 'knowledge economy' and 'high tech' jobs. It will be an incubator for high-tech businesses, research and development facilities and educational institutions.

Site design and improvements will be of high-quality, and integrate energy efficient and environmentally sound (green) principles and practices.

At the center, uses will facilitate social interaction: a variety of housing, in proximity to restaurants, retail, service, entertainment, cultural facilities and recreation.

Transit to Bishop Airport will be available, and a multi-use pathway system will connect uses within the Village, as well as destinations in Grand Blanc Township, the City of Grand Blanc, and the region.

- Improve the interchange at Dixie Highway and Saginaw Street
- Provide wireless capability
- Promote LEED certification
- Maintain existing natural resources throughout Village

On **June 27, 2012** the Township hosted an Open House to review the Technology Village concept. Maps and information were available for viewing and discussion. A brief presentation of the process as well an overview of the anticipated development and other changes in the area was provided. Several Planning Commissioners were present for informal discussions. Participants asked questions and explained their views regarding development of the area. Four written comment cards were submitted—three of which supported planning and economic development efforts for this area. One attendee expressed concerns about the Dort Highway extension and its impact on the rural character of the residential area near the proposed roadway.

GOALS and OBJECTIVES

The goals and objectives from the 2008 Technology Village Area Plan have been incorporated into this Master Plan Supplement. These goals and objectives do not supersede or conflict with those of the 2010 Master Plan Update; rather, these goals and objectives are intended to specifically address land use conditions and changes for the future of this area of the Township.

Goal 1: Develop an amendment to the Master Plan that would allow for the realization of a Technology Village Area

Goal 1 Objectives:

- Design a conceptual lay-out for Village uses: a village district (a denser development form that incorporates residential, restaurant, entertainment, retail and personal service uses); high-tech districts (medical campus, research and development and light industrial facilities, and educational institutions); public spaces; recreation uses; and multi-use pathway network that connects places in Technology Village as well as to places in Grand Blanc Township and the region.
- The conceptual layout must respectfully integrate the rural character present in the southwest portion of the Technology Village Area, and the natural features present throughout, but particularly those in the southeast portion of the Area.
- Amend the Capital Facilities Plan, as necessary, to ensure that the infrastructure required by uses in the Village is in place before development occurs (i.e. stormwater management, wireless capabilities).
- Update the Thoroughfare Plan, as necessary, to ensure that network facilitates accessibility and traffic safety.
- Incorporate smart growth principles into the goals, objectives and implementation strategies for the Technology Village area.

Goal 2 Objectives:

- Initiate a dialogue with local governments that have successfully implemented a technology village concept.
- Collaborate with the knowledge-businesses and institutions that the Township eventually wants to attract to the area. Include colleges and universities before, during and after the planning process to ensure that the plan and implementation strategies will result in the desired Technology Village concept.
- Collaborate with knowledge-based businesses and colleges and universities and other key agencies such as the Michigan Economic Development Corporation (MEDC) as a means for recruiting high-tech businesses and educational institutions to the Technology Village area.
- Explore and create incentives for initially attracting knowledge-based businesses and colleges and universities to the area.

Goal 2: Develop partnerships with private entities, other civic organizations and educational institutions to attract technology firms and programs to the Grand Blanc Community.

Goal 3 Objectives:

- Promote participation in the Leadership in Energy and Environmental Design (LEED®) certification program.
- Incorporate policies in the Master Plan that facilitate incorporation of the natural environment into the site design.
- Promote the use of development techniques that incorporate environmental features and allow for flexible designs in order to minimize negative impacts on natural features including innovative road designs and Planned Unit Developments.
- Promote attractive design of industrial and research and development sites to improve community aesthetics including extensive use of trees, low signs, minimal impervious surfaces, substantial landscaped buffers and other forms of industrial screening.
- Encourage appropriately located industrial and research and development projects so as to minimally impact residential areas while providing community employment and tax revenue.
- Continue to develop regulations and adequate enforcement measures to minimize nuisances including noise, light, air pollution and water pollution.

Goal 3 : Promote sustainable development and protect and preserve the area's natural resources

Goal 4 : Develop a economic development and marketing strategy for the Technology Village Area.

Goal 4 Objectives:

- Build a website specifically dedicated to the Grand Blanc Technology Village.
- Brand the Technology Village Area with a logo and other unique elements.
- Promote the redevelopment of existing light industrial and research parks to attract technology firms to the area.
- Prepare marketing materials on available property for high-tech, medical, and Technology Village property.
- Create and annually re-evaluate a detailed marketing strategy.
- Participate in the I-69 International Trade Corridor and maximize the resources available for member counties.

Goal 5 : Establish benchmarks and a timeline by which to gauge success.

Goal 5 Objectives:

- Develop and describe planning benchmarks in the Technology Village Master Plan.
- Develop short-term and long-term strategies to achieve benchmarks.

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future land use plan

The Future Land Use Plan component of the Master Plan document identifies action strategies designed to achieve the long-range goals and objectives of the Township.

Preferred Growth

As stated in the 2010 Master Plan Update, the Future Land Use Map is based upon the Township's desire to encourage responsible and sustainable growth that is sensitive to the natural environment, creates a sense of place, and meets the needs of future residents and businesses, while encouraging a solid tax base capable of supporting quality schools and public services. It is a guide for land use decisions that help the Township realize its vision. Specifically, the Plan is intended to:

- Maintain and enhance the Township's diverse character and historical resources.
- Encourage development of land in an environmentally and economically sound manner that optimizes development possibilities while protecting natural resources for future generations.
- Encourage cohesive, high-quality, attractive development of which the Township can be proud.

This Master Plan Supplement addresses the conditions, vision, and goals for the Technology Village area within the context of the Township's overall Master Plan framework.

Future Land Use

The Master Plan and Future Land Use Map are tools to be used by the Planning Commission and Township Board during land use decision-making, capital improvement planning, development review, and ongoing reevaluation and refinement of the Township's ordinances. Implementation of the general recommendations and specific action

strategies will occur over time and will depend upon many factors, including the overall economic climate, changing development and demographic trends, availability of infrastructure, local budget constraints, and political priorities.

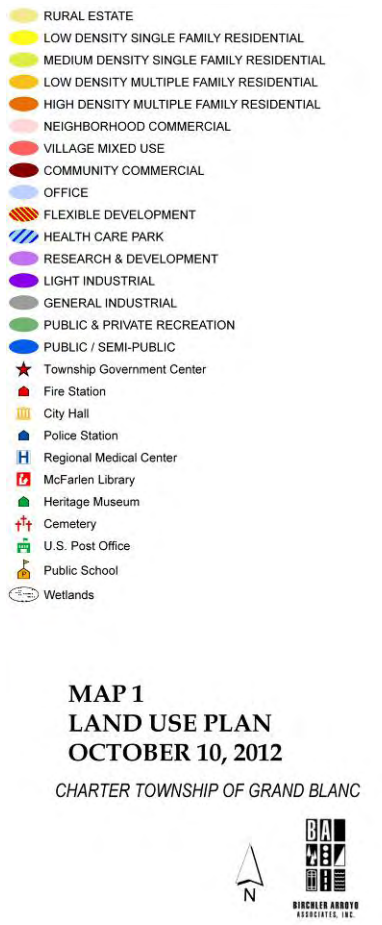
The Future Land Use Map (Map 1, Land Use Map) is a representation of the Township's preferred long-range future land use arrangement, and this map specifically focuses on the Technology Village Area. The map identifies general locations for various land uses envisioned by the Planning Commission. The Future Land Use Map, along with the entire Master Plan document, is a guide for local decisions regarding land use. The boundaries reflected on the map are not intended to indicate precise size, shape or dimension. In addition, the Future Land Use Map does not necessarily imply that rezoning is imminent; rather, the recommendations set a long-range planning goal. Following are descriptions of the future land use categories illustrated on the map. For this supplement, the Township has focused on the land use categories found in the Technology Village area. Specific strategies are addressed in the Implementation chapter.

Land Use Categories in the Technology Village Area/Southwest Portion of the Township

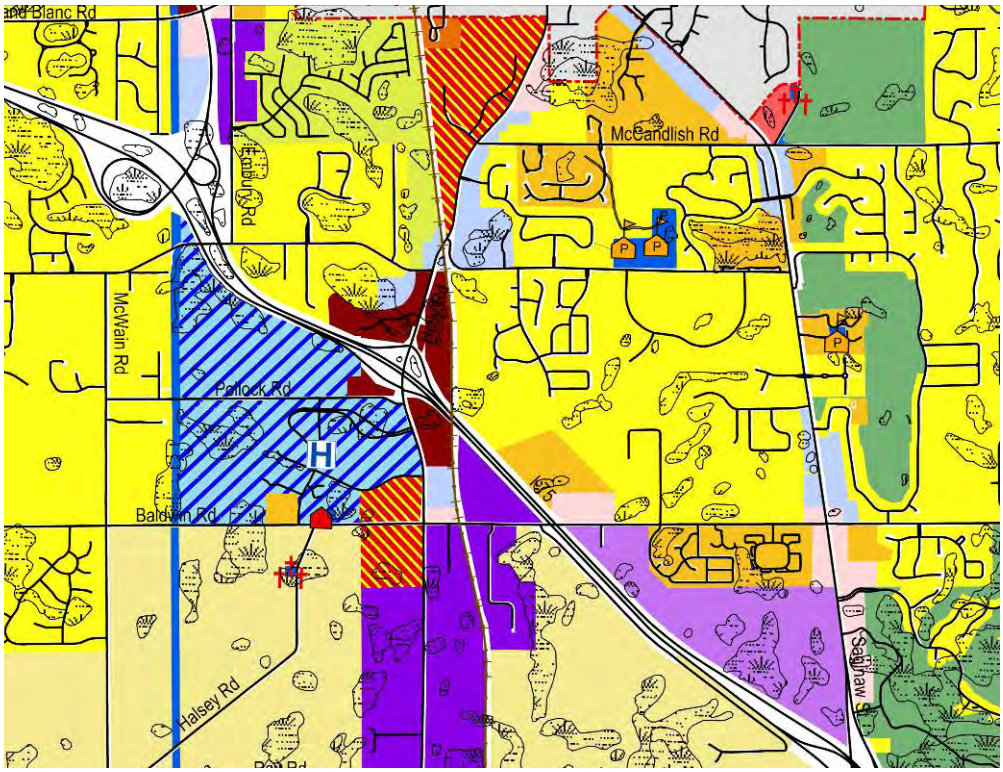
Rural Estate Residential. This category is intended to promote large lot residential development at densities of one (1) unit per acre to allow for setbacks from adjacent uses and adjacent public roadways. Rural estate land uses are intended to promote the preservation of significant environmental and natural features and are concentrated within the southern portion of the Township, south of I-75. **There are no proposed changes to lands designated as Rural Estates.**

Low Density Single Family Residential. Development densities ranging from 1.7 to three (3) dwelling units per acre are provided for within this single family development category to accommodate suburban subdivision style development. A majority of the Township's land area is planned for this use category, including the area west of the Health Care District and the proposed Dort Highway Extension. As it extends south of I-75, north and south of Cook Road, the proposed road would be located in land currently designated as Low Density Single Family Residential. **There are no proposed changes to lands designated as Low Density Single Family Residential.**

Medium Density Single Family Residential. Smaller lot single family subdivisions with densities ranging from 3.1 to four (4) dwelling units per acre are anticipated within this land use category. Several areas south of Maple Road are planned for this land use category. Property east of Embury Road and south of the City limits is also designated medium density single family residential. **There are no proposed changes to lands designated as Medium Density Single Family Residential.**



Focus on the Technology Village Area



Low Density Multiple Family Residential. Multiple Family development at densities of 4.0 to ten (10) dwelling units per acre is projected for areas within this land use category. Low density multiple family uses include townhomes, courtyard apartments and attached condominiums. This land use category is planned for many locations dispersed throughout the Township. The largest concentration of property designated for this land use is located north of Grand Blanc Road and east of Fenton Road. <u>There are no proposed changes to lands designated as Low Density Multiple Family Residential</u>.

Neighborhood Commercial. This land use category encompasses small commercial/retail uses that serve the convenience consumer needs of nearby residential neighborhoods. Uses may include drug stores, florists, beauty salons, and modest-sized grocery stores. Areas are planned to provide nodes of development at key intersections while discouraging strip commercial development along roadways. In order to accommodate such uses in the Baldwin/Holly area, <u>an approximately 4.5 acre parcel at the northeast corner of Baldwin and Holly Roads has been changed from an Office designation to a Neighborhood Commercial designation</u>.

Community Commercial. Larger, community commercial centers and highway-oriented business are included within this land use category. Areas designated for this land use are located at highway interchanges and at the Dort Highway/Hill Road/Saginaw intersection area. **There are no proposed changes to lands designated as Community Commercial.**

Office. Uses with this land use designation include professional offices, medical offices, and personal services that are ancillary to an office use. Office uses are designated for areas with good access to major thoroughfares. In some cases, office uses act as a transition between higher intensity light industrial and/or retail commercial uses and residential areas. The largest concentration of office is located south of Hill Road, east of I-475, around the current GMSPO headquarters location. As mentioned previously, a **4.5 acre parcel at Holly and Baldwin has been changed from an Office designation to Neighborhood Commercial.**

Flexible Development. This land use category is designed for specific locations within the Township that could accommodate a mixed-use or single-use development limited to residential, commercial, and office uses. It is anticipated that development within these areas would be accomplished by use of a flexible development tool such as a Planned Unit Development agreement. The areas designated within the Township for this classification include property near I-475 and Hill Road, Saginaw Street south of Maple Avenue, Baldwin and Holly Roads, and an area south of the City, west of Holly Road. **There are no proposed changes to lands designated as Flexible Development.**

Health Care Park. This land use designation is specific to the Genesys Regional Medical Center and existing and future accessory uses. This area is intended to serve the community and region with uses related to healthcare and medical research, including retirement housing or housing related to other targeted groups.**There are no proposed changes to lands designated as Health Care Park.**

Research and Development. An area at the southwest corner of S. Saginaw and Baldwin Road has been designated for Research and Development. Site size is adequate to develop into a multi-unit research and development park. The site also has good visibility from I-75 and is accessible to that interstate via S. Saginaw Street. **There are no proposed changes to lands designated as Research and Development.**

Light Industrial. These areas are intended to accommodate office, light industrial, warehousing, and research and development uses. Development would preferably occur within an integrated planned environment. In all areas, the exterior impact of such uses would be limited to the district and no outdoor storage would be permitted. When adjacent to residential uses, appropriate buffering should be provided. **There are no proposed changes to lands designated as Light Industrial.**

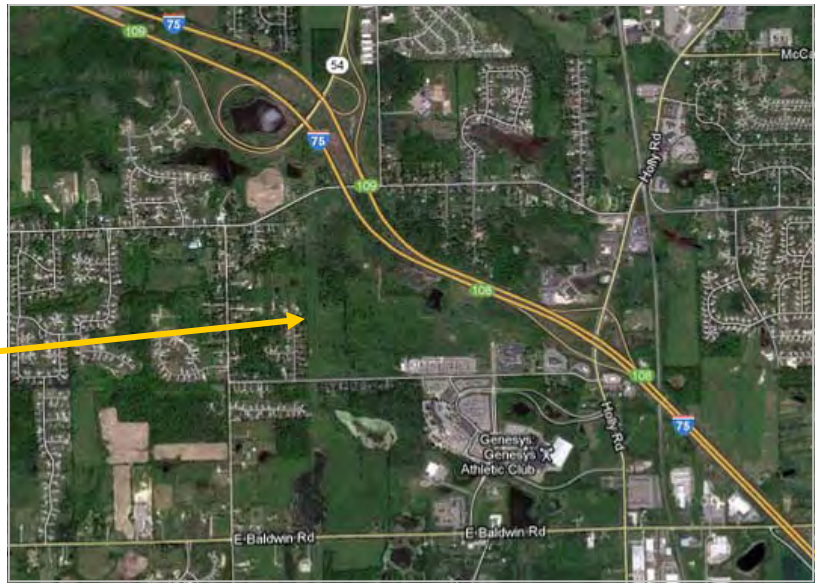
The primary goal of the **Thoroughfare Plan** is to plan for a road network that will serve the residents and businesses anticipated in the Land Use Plan chapter. This includes Grand Blanc Township's road network of State, County, and private roadways. The Thoroughfare Plan is designed to be consistent with the recommendations contained within the Township's *Transportation Plan* (March 2006), and the Genesee County Metropolitan Planning Commission's *2035 Long Range Transportation Plan* (July 2009).

Thoroughfare Plan

The Township is updating its 2010 Thoroughfare Plan to include the changes anticipated in conjunction with the Dort Highway Extension.

Thoroughfare Plan Map - The Thoroughfare Plan Map (Map 2) displays the proposed functional classifications for all the public roads within Grand Blanc Township. It also includes proposed new roads, extensions to existing roadways, and proposed major improvements. There are many opportunities in the Technology Village area to improve access that would encourage development and redevelopment.

Extension of the Dort Highway Connector to Baldwin Road will improve access to the Technology Village area.

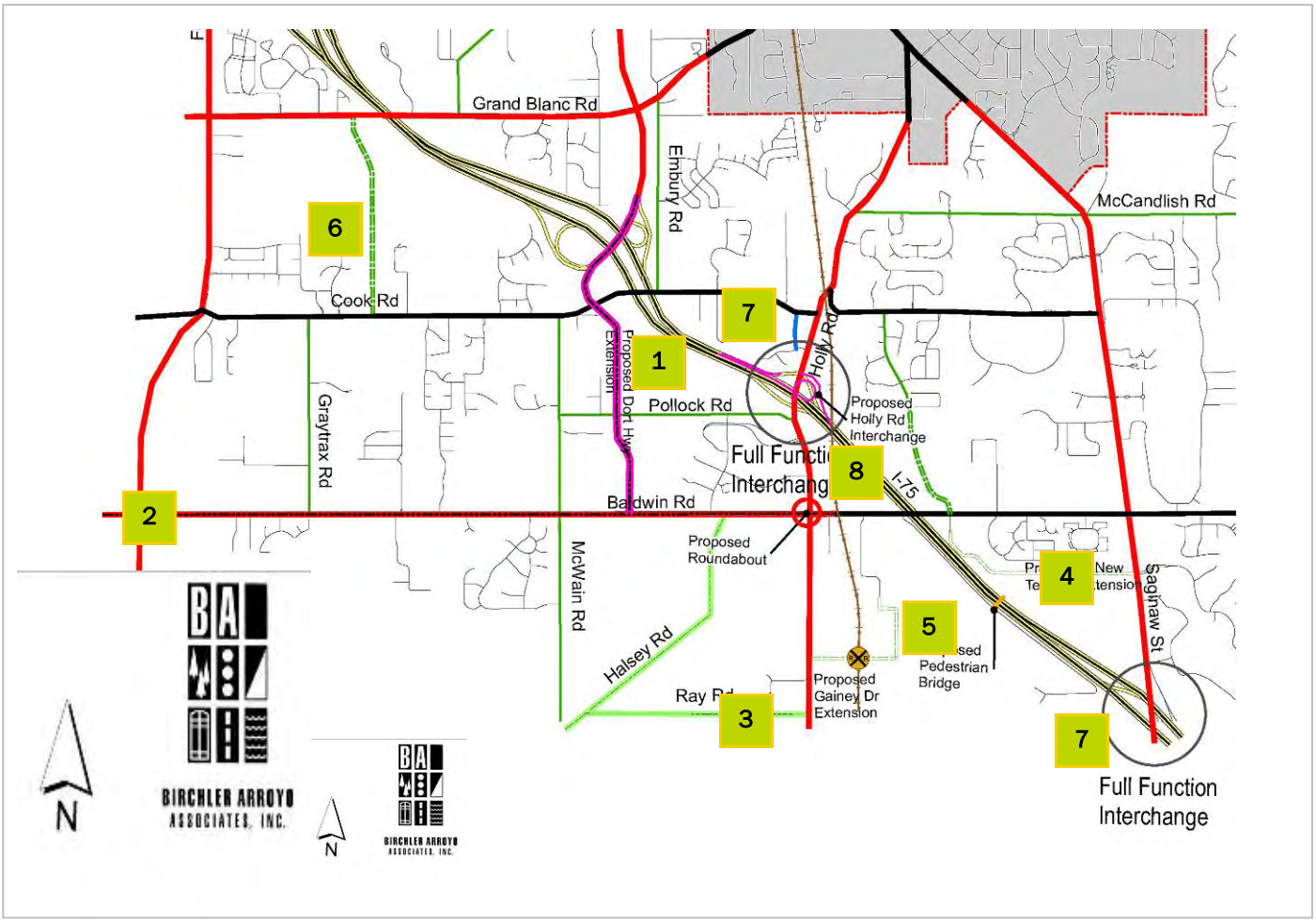


Improvements to roads in this portion of the Technology Village area will offer additional access to parcels planned for commercial, industrial and research & development.

Further, improving the interchanges at I-75 to Saginaw and Holly Roads will also improve accessibility to this area.

The 2010 Master Plan discussed the potential for this area to be developed as parkland.

Map 2. Thoroughfare Map. Focus on Technology Village portion of Grand Blanc Township



Notable designations that differ from the 2010 Thoroughfare Plan include:

1. The proposed Dort Highway Extension that runs south from the Dort Highway/I-75 interchange to Baldwin Road
2. Improvements to make Baldwin Road a 4-lane divided road from the western Township border (Fenton Road) though the Holly Road intersection.
3. An extension of Gainey Drive that would create an access to Holly Road, between Ray Road and Baldwin Road.
4. An extension of New Tech Drive that would provide access to Saginaw Street, south of Baldwin Road.
5. A pedestrian bridge over I-75 that would offer non-motorized travel and access into a potential park in this area
6. A new paved collector that would connect Cook Road to Grand Blanc Road between I-75 and Fenton Road.
7. Full function interchanges from I-75 at Saginaw and Holly Roads
8. A paved collector street east of I-75 that would connect Baldwin to Cook Road.

implementation

Implementation Tools and Techniques

The Township has a wide variety of tools and techniques at its disposal to help implement its long-range planning, including, but are not limited to:

- Zoning Ordinance Standards and Map
- Code Enforcement
- Subdivision and Condominium Regulations
- Special Design Plans and Study Area Plans
- Capital Improvement Program
- Public Utility Policy
- Public—Private Partnerships
- Site Plan, Special Land Use, and Rezoning Review
- Special Millages and Assessments
- Local Land Trusts and Conservancies
- Access Management Planning and Regulation
- Federal and State Grant Programs
- Re-evaluation and Adjustment of the Master Plan

A Master Plan is only worthwhile if it is implemented. There are a wide variety of tools and techniques available to help implement the Township's Master Plan. One of the most effective tools is the Zoning Ordinance. Periodic review and amendment of the Zoning Ordinance is critical to ensure that the Township's current use and development standards are consistent with its long-range goals. Consistent application of zoning standards through the site plan review process, as well as consistent, impartial code enforcement, are also vital to the success and implementation of the Master Plan.

It is the responsibility of the Planning Commission and Township Board to implement the long-range policies and recommendations of the Master Plan, as appropriate, to achieve the future vision and goals of the Township. The Township Board, Planning Commission, and Planning Staff should review the Action Strategies Summary Table on a regular basis, assess priorities, and develop annual work plans. In addition ensure that decisions and policies are consistent with the vision of the Plan. The Township's implementation priorities and schedule will likely change over time as conditions change, such as the state of the economy, development trends, demographic shifts, financial ability, etc.

Action Items

The 2010 Master Plan included implementation strategies in the form of an Action Plan. Following the plan's adoption, the Planning Commission went through a prioritization exercise of the action strategies and assigned short– and long-term priorities. Then they further refined the short-term strategies into a work plan for the first year. The following table illustrates the prioritized action items from the 2010 Master Plan (short– or long-term indicated by a ◎ symbol) and the identified short-term strategies (noted by YR 1, 2, or 3). Many of these items are indirectly related to the Technology Village area and/or benefit the Township as a whole. "TV" indicates these items in the table.

Action Item Summary Table			
Action Item		**Short-term**	**Long-term**
Smart Growth Strategies			
Conduct a "sustainability audit" of the Zoning Ordinance to identify opportunities for incorporating sustainability standards		Completed	
Create a resource list to help residents find information about alternative energy sources and low impact development techniques, as well as local suppliers, installers and contractors.	TV	YR2	
Encourage low impact development stormwater management techniques.	TV		◎
Address alternative energy systems in the Zoning Ordinance.	TV		◎
Develop incentives to encourage developers to utilize energy efficient and environmentally sensitive materials and practices.	TV		◎
Develop an educational campaign to promote environmental stewardship.	TV		◎
Review parking standards for unnecessary impervious surface code requirements.	TV		◎
Encourage the use of native species for landscaping and stormwater management purposes.	TV		◎
Maintain an inventory of wetlands in the Township.			◎
RESIDENTIAL			
Encourage development of a wide variety of housing styles			
Zone appropriate areas for single and multiple family development at a variety of densities.	TV		◎
Encourage compact residential development near neighborhood commercial, with adequate pedestrian linkages.	TV		◎
Maintain low-density single-family areas in appropriate locations to preserve the heritage and character of the community.			◎
Encourage a variety of residential designs to establish a relationship between preserving the character of low density residential and promoting high quality development at all densities.			◎
Encourage the location of quality retirement housing near community and civic uses for a range of housing needs and income levels.	TV		◎
Encourage generous buffers to high volume roads and where designated on the Land Use Plan, use multi-family to transition to more intensive uses.	TV		◎
Promote open space of appropriate size and function in residential developments based on the character of the area, natural features and location within the community.			
Encourage the use of residential development options that permit flexibility in design in order to achieve quality development by providing incentives for the preservation of environmental features and open space.			◎
Establish mechanisms to assist in long term maintenance of open space areas.		YR3	

Continued on next page

Action Item Summary Table			
Action Item		**Short-term**	**Long-term**
Preserve the residential character of the Township and protect the long-term stability of neighborhoods			
Protect the long-term stability of neighborhoods through adequate code enforcement and zoning regulations.			◎
Establish high quality design and landscape standards through the use of development regulations and incentives.		YR1	
Define preferred residential designs and elements that should be incorporated into residential projects. Develop and provide a brochure to be distributed to residential builders and developers.			◎
Explore amending the ordinance to provide incentives to single family developments that incorporate certain preferred residential designs and elements, such as side and rear entry garages, high-quality building materials, etc			◎
Incorporate traditional neighborhood design elements into residential developments, including sidewalks, street trees, and the location of a central public space from which the surrounding neighborhoods radiate.			
Require pedestrian connections between areas designated as open space and home sites.			◎
Promote a sense of place within local neighborhoods by requiring street trees, sidewalks, pedestrian lighting and amenities including benches and attractive street signs.			◎
Encourage networks in residential developments and connect neighborhoods with each other as well as with shopping and office developments.	TV		◎
Require implementation of portions of the Township Pathways Plan through residential site development approval.			◎
COMMERCIAL			
Plan for the development and redevelopment of commercial areas sufficient in size and location to meet the shopping needs of Township residents			
Zone appropriate areas for community commercial development at interchanges to permit highway oriented business to locate near interstates and discourage strip development along major roadways.	TV		◎
Review and revise zoning ordinance standards for existing commercial districts to permit concentrated and attractive community shopping centers to be developed so that smaller strip commercial is discouraged.	TV		◎
Promote the use of the Planned Unit Development for larger commercial projects to give the community quality development that is context-sensitive and unique.	TV		◎
Permit commercial development in selected areas near existing or planned job centers with a clearly defined set of limited uses that serve the businesses and employees in those centers.	TV		◎

Continued on next page

Action Item Summary Table			
Action Item		**Short-term**	**Long-term**
Encourage community commercial uses in strategic areas within the Township.			
Encourage community commercial development in locations with sufficient infrastructure, convenient road access and where compatible with surrounding development.	TV		◎
Encourage redevelopment of the Hill Road Corridor, Holly/Baldwin/Saginaw area and the South Saginaw Corridor, pursuant to the goals and objectives of their respective plans.	TV		◎
Amend the Zoning Ordinance to accommodate recommendations of the Saginaw Corridor Study.		YR1	
Close and vacate portions of roadways as recommended in the Saginaw Corridor Study.			◎
Apply access management strategies when properties develop or redevelop	TV		◎
Develop clear and comprehensive building and site standards to ensure quality development.	TV	YR1	
Plan for selected nodes of neighborhood commercial development throughout the Township and discourage strip commercial development along major roadways			
Zone appropriate areas for neighborhood commercial development at specific major roadway intersections throughout the Township rather than promoting strip commercial development along roadways.	TV		◎
Establish design guidelines and screening / landscaping standards that achieve quality development, commensurate with Township character.	TV	YR1	
Review and revise zoning ordinance standards for existing commercial districts to permit development of attractive neighborhood shopping centers of a size sufficient to include various uses, further discouraging smaller strip commercial.	TV		◎
Design setback requirements that discourage large parking lots from being placed within front yards and permit buildings to be brought closer to the street.	TV		◎
Require pedestrian connections with existing residential, where possible.	TV		◎
Plan limited areas in the Township for Flexible Development projects.			
Identify appropriate areas for flexible developments in the Master Plan.	TV		◎
Use Planned Unit Development or other flexible zoning tool to achieve a mixed use or alternative commercial development.	TV		◎
Establish design guidelines, screening and landscaping standards, and other appropriate requirements as conditions of approval that achieve quality development, commensurate with Township character and the context of the surrounding area.	TV	YR1	

Continued on next page

Action Item Summary Table			
Action Item		**Short-term**	**Long-term**
INDUSTRIAL			
Promote the redevelopment of industrial parks and individual buildings and plan for new industrial development with access to major roadways to encourage job-creating businesses to the Township.			
Zone appropriate areas throughout the Township for light and general industrial uses.	TV		◎
Industrial areas should be limited to areas with access to major roadways and interstates.	TV		◎
Develop a tiered-use zoning approach for light industrial districts that limits permitted uses when adjacent to residential neighborhoods to minimize impacts for residents.	TV		◎
Limit more intensive industrial uses to areas not adjacent to residential neighborhoods.	TV		◎
Promote the use of shared driveways and internal connections between individual users to reduce the impact of truck traffic on roadways	TV		◎
Encourage quality design and site planning with development standards.			
Develop landscape standards that require screening along road rights-of-way.	TV		◎
Permit quality landscape materials to be used that would not detract or hide main buildings.	TV		◎
Ensure sign standards are adequate to complement right-of-way treatment and not overwhelm the streetscape.	TV		◎
Require screening between uses to carry the same theme and provide for alternative screening including preservation of existing vegetation, use of supplemental plantings, screen walls, etc.	TV		◎
Screen rooftop appurtenances from view from property lines and public roads based on zoning ordinance standards.	TV		◎
Encourage development of Research and Development uses of a sufficient size and location to attract viable R&D Users which will further the employment opportunities in the community.			
Zone an area large enough to support research and development uses.	TV		◎
Create an economic development program to promote the area to R&D users and to coordinate marketing efforts with the County and universities.	**TV**	**YR1**	
Develop building and site design standards that call for quality development commensurate with the goal of locating premier R&D users to the area	TV		◎
Continue planning for and promote development of the Technology Village Area.			
Design conceptual layout for the Technology Village Area.	TV	YR1	
Develop partnerships aimed at refining the Technology Village Area concept, retaining existing high-tech businesses, and recruiting new businesses.	TV	YR2	
Create sustainable development standards that encourage high-quality development that protects the area's natural resources.	**TV**	**YR1**	
Develop a Technology Village Area marketing plan.	TV	YR1-2	
Establish benchmarks and timeline for Technology Village Area implementation strategies.	TV	YR1-2	

Note: the two **bold** items above were top Year 1 Priorities in the 2010 Master Plan Implementation

Zoning Plan and Matrix

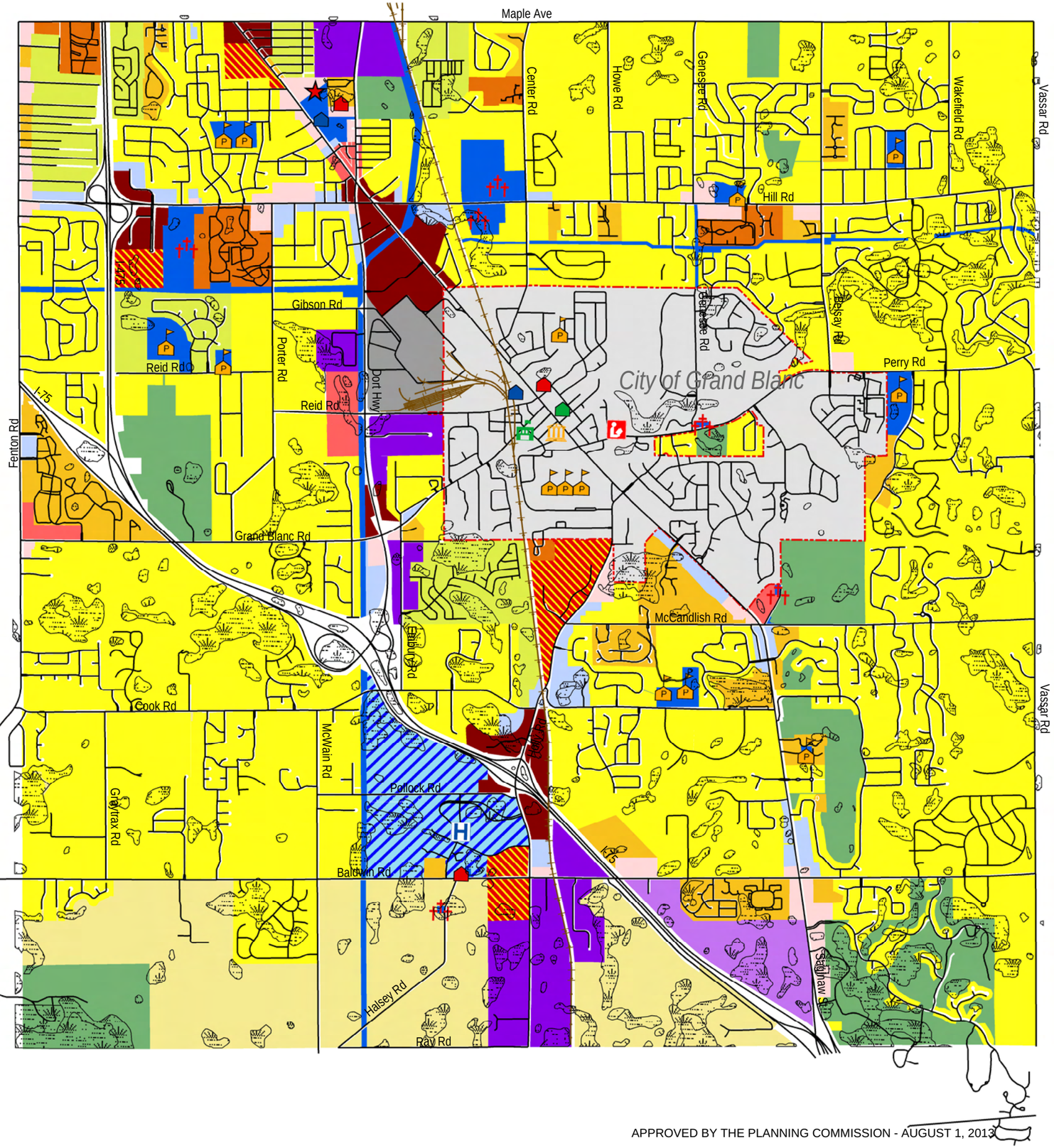
Zoning is one of the Township's most effective tools for implementing the recommendations of the Master Plan; however, there is not always a direct correlation between the Plan's future land use designations and the Township's current zoning districts. The reason for this is that the Future Land Use Map represents the Township's preferred long-range land use arrangement, while the Zoning Ordinance regulates specific use and development of property today. Many of the Plan's recommendations are likely not feasible under current zoning; new districts may need to be created and existing districts may need amending. As an implementation tool, the Zoning Matrix illustrates (see Figure I-1) how the future land use designations generally correspond to the existing zoning districts. It is important to remember that in many cases, zoning amendments would be necessary to be consistent with the intent and recommendations of the Master Plan.

The Zoning Plan is intended to guide short-term implementation of the long-term recommendations illustrated on the Future Land Use Map. The intent of the Zoning Plan is not to identify all areas that would require rezoning to be consistent with the Plan. Rather, the Zoning Plan highlights specific key or priority areas where existing zoning is significantly lacking appropriate standards or would inhibit development in accordance with the Master Plan.

There are no changes proposed to the Zoning Plan.

Future Land Uses	Existing Zoning Districts																	Amendments to / Review of Existing District (s) Recommended	New Zoning District Recommended
	RE Rural Estate	R-1 One Family	R-2 One Family	R-3 One Family	R-4 One Family	LDM Low Density Multiple Family	MDM Medium Density Multiple Family	HDM High Density Multiple Family	OS Office Service	PO Professional Office	HCD Health Care District	NC Neighborhood Commercial	GC General Commercial	RD Research & Development	I-1 Light Industrial	I-2 General Industrial	P-1 Vehicular Parking		
Rural Estate	◎																		
Low Density Single Family Residential		◎	◎																
Medium Density Single Family Residential				◎	◎														
Low Density Multiple Family Residential						◎	◎												
High Density Multiple Family Residential								◎											
Neighborhood Commercial												◎							
Village Mixed Use																			◎
Community Commercial													◎						
Office									◎	◎									
Flexible Development																			
Health Care park											◎								
Research & Development														◎					
Light Industrial															◎				
General Industrial																◎			
Public & Private Recreation																			
Public/Semi-Public																			

Appendix



- RURAL ESTATE
- LOW DENSITY SINGLE FAMILY RESIDENTIAL
- MEDIUM DENSITY SINGLE FAMILY RESIDENTIAL
- LOW DENSITY MULTIPLE FAMILY RESIDENTIAL
- HIGH DENSITY MULTIPLE FAMILY RESIDENTIAL
- NEIGHBORHOOD COMMERCIAL
- VILLAGE MIXED USE
- COMMUNITY COMMERCIAL
- OFFICE
- FLEXIBLE DEVELOPMENT
- HEALTH CARE PARK
- RESEARCH & DEVELOPMENT
- LIGHT INDUSTRIAL
- GENERAL INDUSTRIAL
- PUBLIC & PRIVATE RECREATION
- PUBLIC / SEMI-PUBLIC
- Township Government Center
- Fire Station
- City Hall
- Police Station
- Regional Medical Center
- McFarlen Library
- Heritage Museum
- Cemetery
- U.S. Post Office
- Public School
- Wetlands

NOTES:
1. This map is intended to show generalized land use and is not intended to indicate the precise site, shape, or dimension of areas. These recommendations have a long-range planning horizon and do not necessarily imply that short-term zoning decisions are appropriate.

2. The Grand Blanc Township Master Plan includes the Land Use Plan Map and all text, maps, charts, tables, and other graphics in the full Master Plan report.

3. See the Residential Density Plan map for more specific residential density recommendations.

4. If future conversion of public and private recreation areas occurs, the intended use is residential at the density identified on the Residential Density Map.

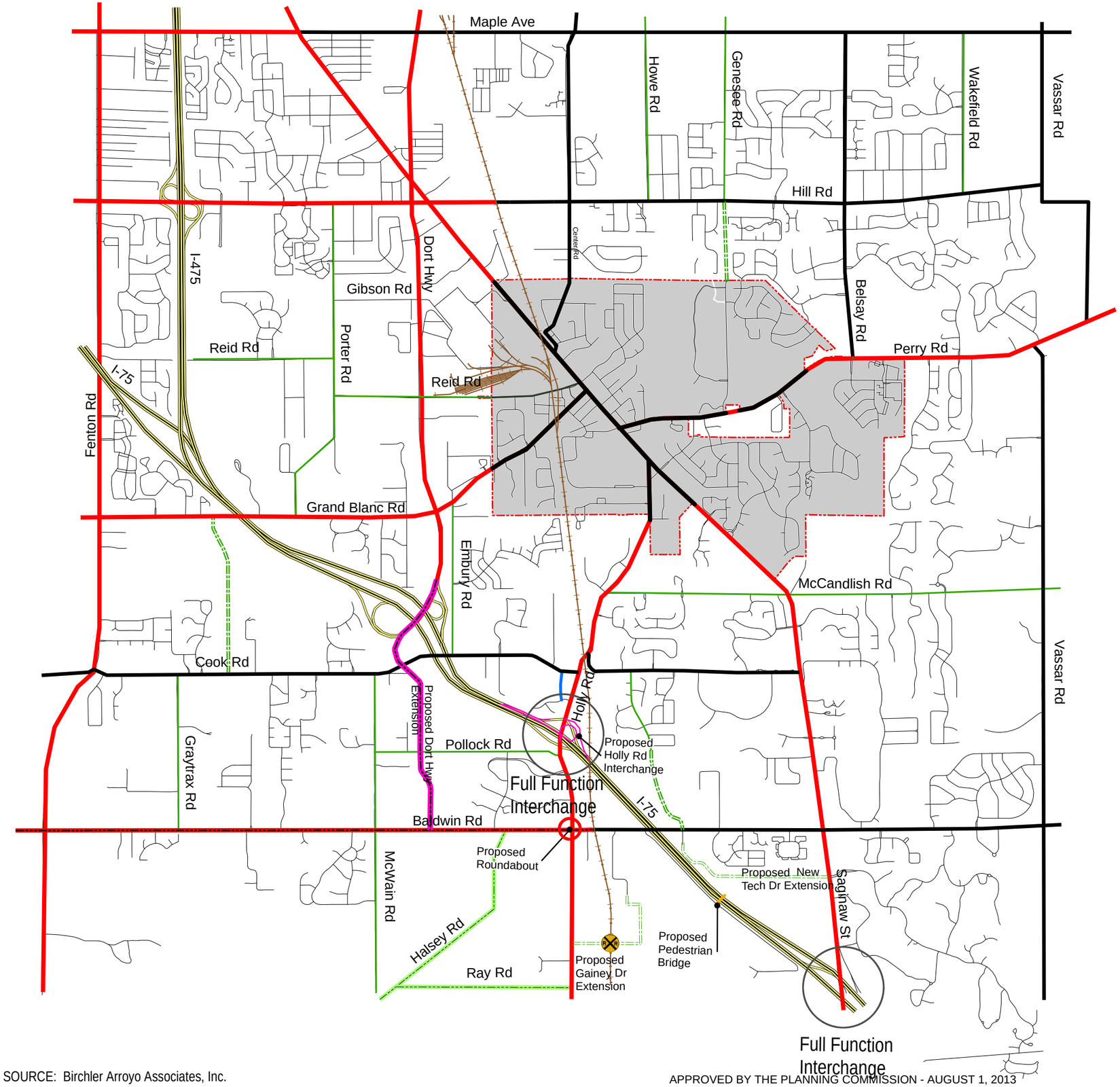
MAP 1
LAND USE PLAN
OCTOBER 10, 2012

CHARTER TOWNSHIP OF GRAND BLANC

N

BIRCHLER ARROYO ASSOCIATES, INC.

APPROVED BY THE PLANNING COMMISSION - AUGUST 1, 2013



- Local Street (66 ft ROW)
- Natural Beauty Road (86 ft ROW)
- Collector (100 ft ROW)
- Proposed Collector (100 ft ROW)
- Minor Arterial (100 ft ROW)
- Arterial (100 ft ROW)
- Divided Arterial (150 ft ROW)
- Proposed Divided Arterial (150 ft ROW)
- Freeway (ROW varies)
- Freeway Ramp (ROW varies)
- Service Drive
- Proposed Holly Rd Interchange
- Proposed Pedestrian Bridge
- Railroad

MAP 2
THOROUGHFARE PLAN MAP
FEBRUARY 7, 2013

CHARTER TOWNSHIP OF GRAND BLANC

N

clearzoning®
CLEAR AND CONNECTED

SOURCE: Birchler Arroyo Associates, Inc.

APPROVED BY THE PLANNING COMMISSION - AUGUST 1, 2013

GRAND BLANC TOWNSHIP
ESTABLISHED 1833

Many factors will contribute to change in Grand Blanc Township. From the Dort Highway Connector, to the I69 International Trade Corridor, to the Technology Village Area, the changing economy in the area and region will require short– and long-range planning efforts to align the community vision for the Township with future growth and development.

WHAT DO YOU THINK?

TRY TO LINE UP SERIES OF INDSUSTRIES BEFORE CONSTRUCTION BEGINS

TOM MCGEE 1131 GREEN MEADOW

GRAND BLANC TOWNSHIP
ESTABLISHED 1833

Many factors will contribute to change in Grand Blanc Township. From the Dort Highway Connector, to the I69 International Trade Corridor, to the Technology Village Area, the changing economy in the area and region will require short– and long-range planning efforts to align the community vision for the Township with future growth and development.

WHAT DO YOU THINK?

I don't think we need a Dort Highway connector. This area is totally connected and this is a designated rural area. This money could be better spent elsewhere and connection to commercial/technology won't be helped by this.

RICHARD JOBBAGY
(MASTER PLAN MEETING)
RJOBBAGY2578@AOL.COM
694-8454
(LOOKING FOR MINUTES FOR THE MEETING)

GRAND BLANC TOWNSHIP
ESTABLISHED 1833

Many factors will contribute to change in Grand Blanc Township. From the Dort Highway Connector, to the I69 International Trade Corridor, to the Technology Village Area, the changing economy in the area and region will require short– and long-range planning efforts to align the community vision for the Township with future growth and development.

WHAT DO YOU THINK?

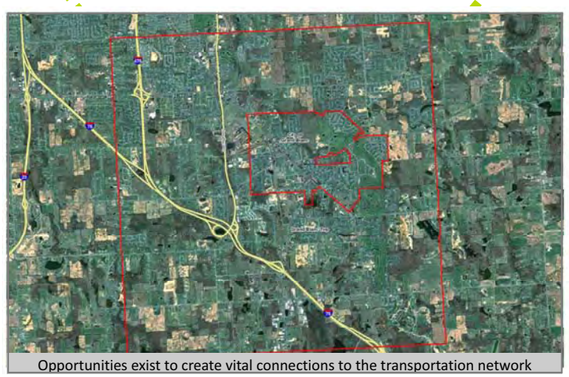
Very informative information for up and coming business in GB Twp.

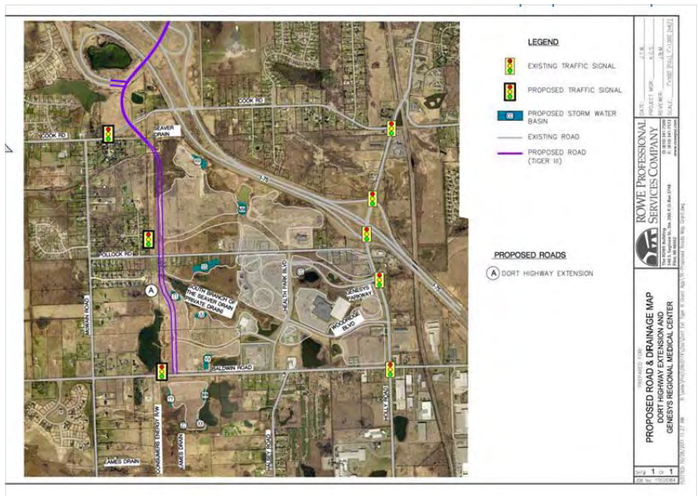
Dort Highway Connector Project

Grand Blanc Township sits in the middle of a significant transportation network

About Dort Highway

- Dort Highway, M-54 is a 27-mile state trunkline which was built in 1962.
- The northern end is at I-75 and M-83, near Birch Run
- In 1987, M-54 ended at I-75, exit 109
- M-54 was designated as a route of US10 through Flint and is a designated truck route.
- A full interchange was planned, but not built, limiting access to this region of Genesee County from the north


Opportunities exist to create vital connections to the transportation network



Dort Highway Connector—Existing Conditions & Benefits of Project

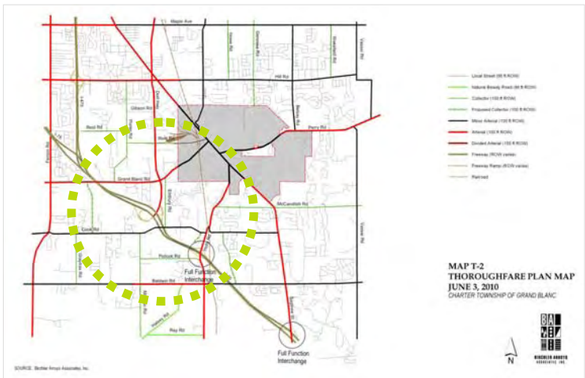
(source: US Department of Transportation TIGER III Discretionary Grant Application—2012)

- The Dort Highway Connector project lies within Grand Blanc Township, in an area of the Township that possesses great opportunity to become a vital hub of economic development.
- The Dort Highway Connector will run from the I-75 Exit 109 South to East Baldwin Road, and will help to facilitate economic development by providing greater connectivity and access to this part of the Township.
- Alleviates traffic congestion at the I-75/Holly Road interchange by providing an alternative route.
- Transportation infrastructure is an important consideration for attracting new business.
- The Connector will run just to the west of the Genesys Regional Medical Center Health Park shown on the map at left.
- Project will include additional opportunities to make connections to alternative modes of transportation.
- This project was identified by the Genesee County Metropolitan Planning Commission in its 2009 Freight & Connectivity Study.
- If approved for funding, construction could begin in early 2014, with completion in 2015.
- The TIGER III grant request describes the 20-year net benefits of this project at $178.8 million. Calculations included auto & truck time savings, economic benefits (jobs and other industry benefits), and crash reductions.

Dort Highway Connector - Project Overview

(source: US Department of Transportation TIGER III Discretionary Grant Application—2012)

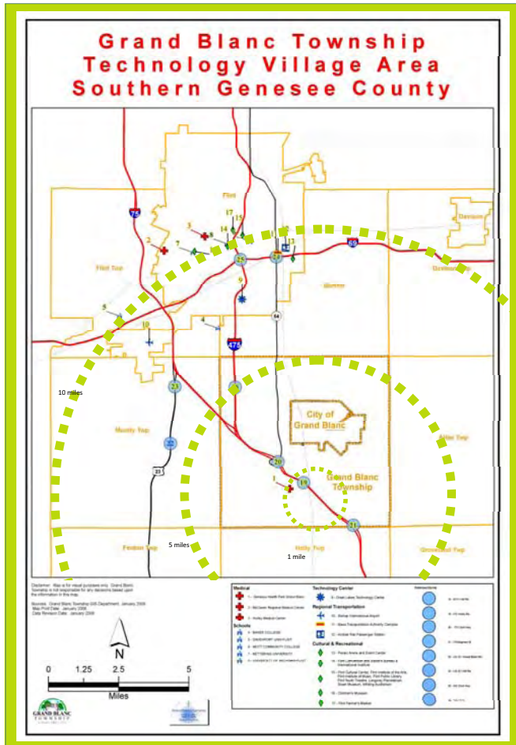
- The Dort Highway Connector will be a four-lane boulevard road, extending the existing Dort Highway at the interchange at I-75 (exit 109) south to Baldwin Road.
- The I-75 interchange will be developed to allow for full access.
- The new connection will be a primary road, owned and operated by the Genesee County Road Commission.
- The project also includes water & sewer infrastructure construction to prepare for planned development.
- Estimated cost is $23.8 million—Grand Blanc Township's share is $1 million.

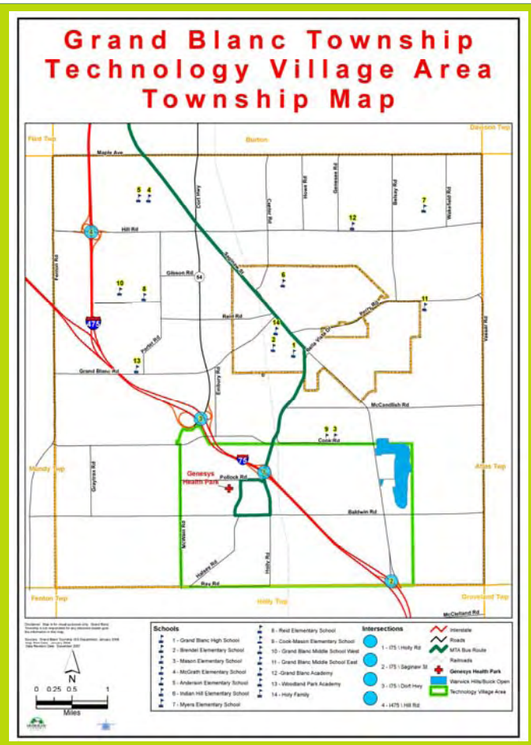


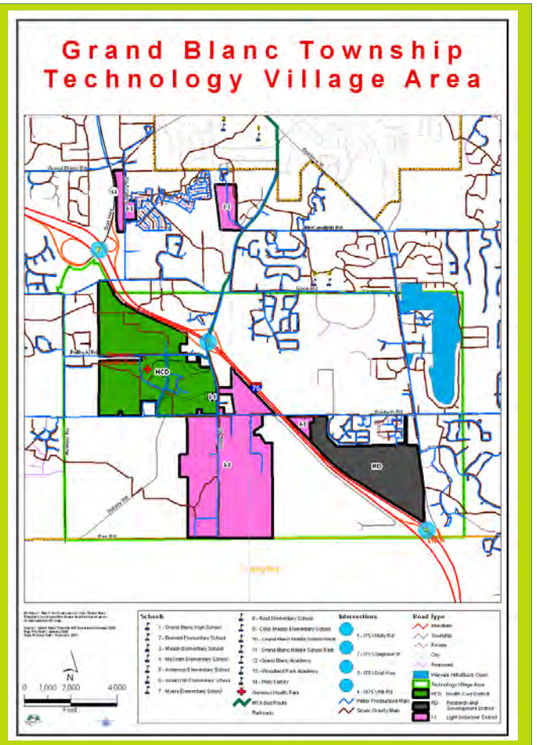
2010 Thoroughfare Plan

- At the time of the Grand Blanc Township Master Plan Update, the Dort Highway Connector was thought to be much farther out on the project timeline
- Changes in the local, regional, and state economy have focused transportation partners into identifying opportunities for business and job growth, and studied infrastructure investment needed to support that growth.
- The 2012 Master Plan Amendment is expected to include the Dort Highway Connector, and assess its impact on land use policy in the Township.

Technology Village







The Technology Village Area is ideally located to capitalize on local and regional strengths.

THE VISION

Based upon public comments received at the May 2008 workshop, the following statement was developed to express the community's vision for the Technology Village Area. The following goals and objectives are intended to support the vision.

Grand Blanc Township's Technology Village is known as a thriving 'New Economy' center. It is a place where people desire to work, live and play. Its vibrancy also serves to attract young people educated in 'knowledge economy' and 'high tech' jobs. It is an incubator for high-tech businesses, research and development facilities and educational institutions. Site design and improvements are of high-quality, and integrate energy efficient and environmentally sound (green) principles and practices. At the center, uses facilitate social interaction: a variety of housing, in proximity to restaurants, retail, service, entertainment, cultural facilities and recreation. Transit to Bishop Airport is available, and a multi-use pathway system connects uses within the Village, as well as destinations in Grand Blanc Township, the City of Grand Blanc, and the region.

Strengths of the Technology Village Area

- Regional accessibility by way of interstate highways.
  - I-75, connecting the Canadian border in Sault Ste. Marie to Miami, Florida, travels through the southwest quadrant of the township and through the heart of the boundaries of the Technology Village.
    - Approximately 50,000 to 70,000 vehicles travel through the Township on I-75 every day.
    - Three I-75 interchanges are located within the township, and all three are either within or immediately adjacent to the boundaries of the Technology Village Area. I-475 is a 17-mile loop that provides direct access to downtown Flint.
  - I-69, which runs from the Canadian border in Port Huron to Indianapolis, carries approximately 85,000 daily vehicles just north of the township.
    - An extension of I-69 from Indianapolis all the way to the Mexican border in southern Texas is in the planning stages. If completed, this "NAFTA Highway" would create a direct link from Mexico to Canada that would run through Genesee County.
    - Grand Blanc Township has access to I-69 via I-475 and Dort Highway.
- **In terms of regional and international highway access, Grand Blanc Township is literally at a crossroads of two of North America's most critical links.**

Goals of the 2008 Technology Village Area Plan

1. Develop a Master Plan amendment that supports a Technology Village Area

Objectives:
- Design a conceptual lay-out for Village uses: a village district, high-tech districts, public spaces, recreation uses, and multi-use pathway network.
- Integrate the rural character and the natural features present throughout the southeast portion of the Area.
- Amend the Capital Facilities Plan, as necessary, to ensure that the infrastructure required by uses in the Village is in-place before development occurs.
- Amend the Thoroughfare Plan, as necessary, to ensure that network facilitates accessibility and traffic safety.
- Incorporate smart growth principles into the goals, objectives and implementation strategies for the Technology Village area.

2. Develop partnerships with private entities, other civic organizations and educational institutions

Objectives:
- Dialogue with local governments across the US that have successfully implemented a technology village concept.
- Collaborate with the businesses and institutions that the Township eventually wants to attract to the area.
- Collaborate with knowledge-based businesses and colleges and universities as a means for recruiting high-tech businesses and educational institutions to the Technology Village area.
- Explore and create incentives for initially attracting knowledge-based businesses and colleges and universities to the area.

3. Promote sustainable development and protect and preserve the area's natural resources

Objectives
- Promote participation in the Leadership in Energy and Environmental Design (LEED®) certification program.
- Incorporate policies in the Master Plan that facilitate incorporation of the natural environment into the site design.

4. Develop a marketing plan once the Master Plan has been amended.

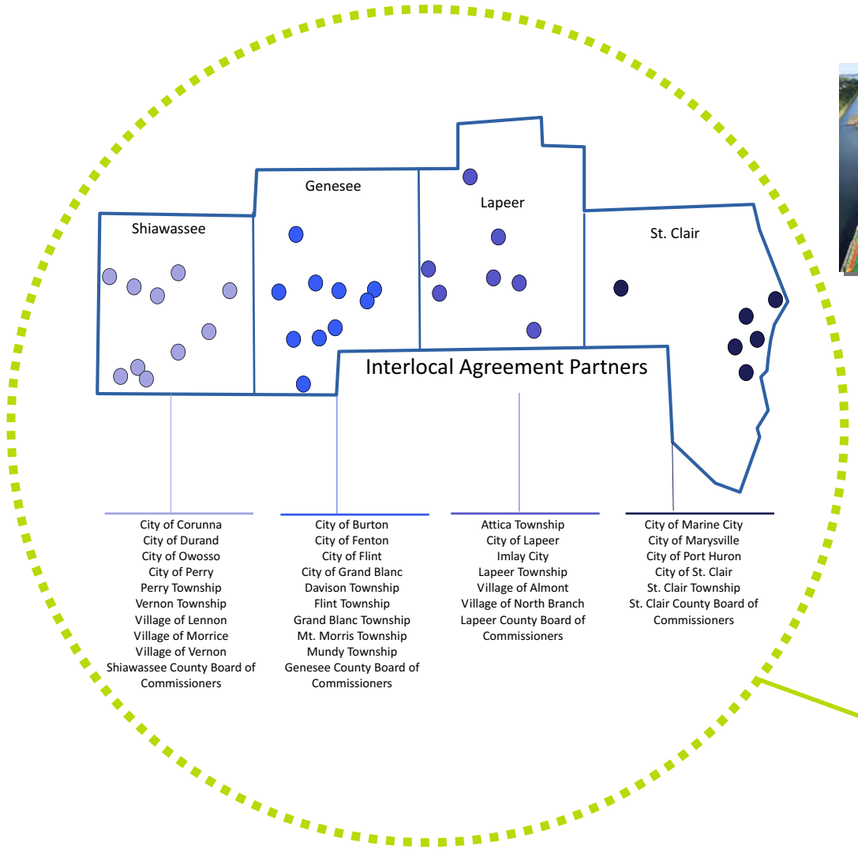
Objectives:
- Build a website specifically dedicated to the Grand Blanc Technology Village. Brand the Technology Village Area with a logo and other unique elements.
- Prepare marketing materials on available property for high-tech, medical, and Technology Village property.
- Create and annually re-evaluate a detailed marketing strategy.

5. Establish benchmarks and a timeline by which to gauge success.

Objectives:
- Develop and describe planning benchmarks in the Technology Village Master Plan.
- Develop short-term and long-term strategies to achieve benchmarks.

I-69 International Trade Corridor

Next Michigan Development Corporation



City of Corunna
City of Durand
City of Owosso
City of Perry
Perry Township
Vernon Township
Village of Lennon
Village of Morrice
Village of Vernon
Shiawassee County Board of Commissioners

City of Burton
City of Fenton
City of Flint
City of Grand Blanc
Davison Township
Flint Township
Grand Blanc Township
Mt. Morris Township
Mundy Township
Genesee County Board of Commissioners

Attica Township
City of Lapeer
Imlay City
Lapeer Township
Village of Almont
Village of North Branch
Lapeer County Board of Commissioners

City of Marine City
City of Marysville
City of Port Huron
City of St. Clair
St. Clair Township
St. Clair County Board of Commissioners



Transportation

(source: US Department of Transportation TIGER III Discretionary Grant Application—2012)

- Genesee County lies at the crossroads of the national and international freight network.
  - I-69, I-75, and US-23
  - Canadian National and CSX Rail lines
  - Bishop International Airport
- Bishop International Airport recently developed a $33.7 million intermodal hub for cargo and other goods

Aerotropolis Questions/Answers

What is an Aerotropolis?
It is a designation conveyed by the State of Michigan to allow communities to collaboratively capitalize on their significant transportation assets, and spur economic development around commercial airports. 5 are allowed; currently, the other 3 include: Detroit Metropolitan Wayne County, Capital Region International (Lansing area), and Cherry Capital Airports (Traverse City area).

What makes the I-69 International Trade Corridor an Aerotropolis?
Intermodal assets: Bishop Airport, I-75, I-69, US-23, the Blue Water Bridge, CSX and Canadian National rails, and several water ports.

What will the Aerotropolis do?
The Corridor will bring with it major business incentives, expedited permitting, business assistance, consistent design and development standards, workforce readiness, and the educational assets of the University Research Corridor

Business Opportunities

(source: I-69 International Trade Corridor Next Michigan Development Corporation Project Overview

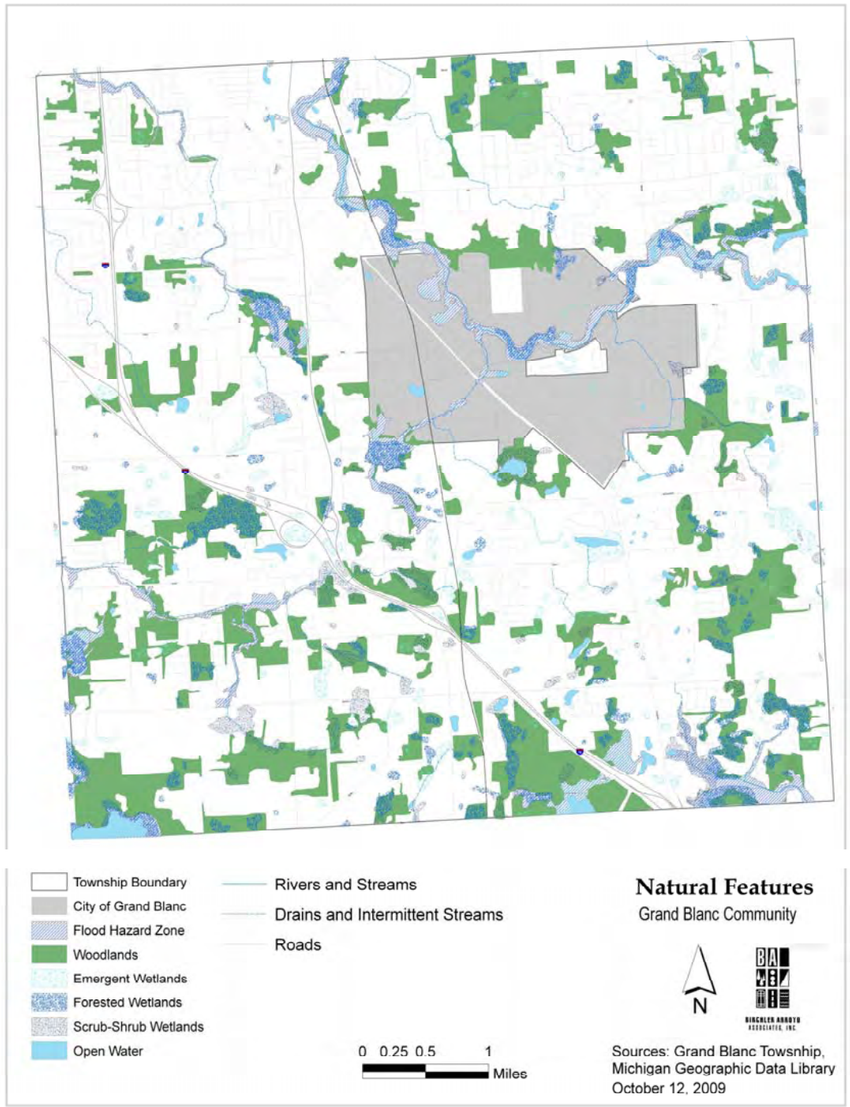
- The corridor could be a component of a larger effort: the Great Lakes International Trade and Transport Hub, a project to capitalize on freight traffic to and from the Port of Halifax in Nova Scotia through the border gateways at Detroit and Port Huron.
- Strategies of the I-69 International Trade Corridor will focus on capturing portion of trade volume passing through the region and exports by regional business base.
- An Upjohn Institute Market Study reports a potential for direct job creation of 18,000 direct jobs and an additional 20,700 indirect jobs.
- According to the Bureau of Transportation Statistics (2010), resumption of growth in worldwide merchandise trade is likely to create more demand for intermodal freight services. Continued integration of global economic activities and resumption of growth in oceanborne and air cargo would increase demand for freight transportation services.

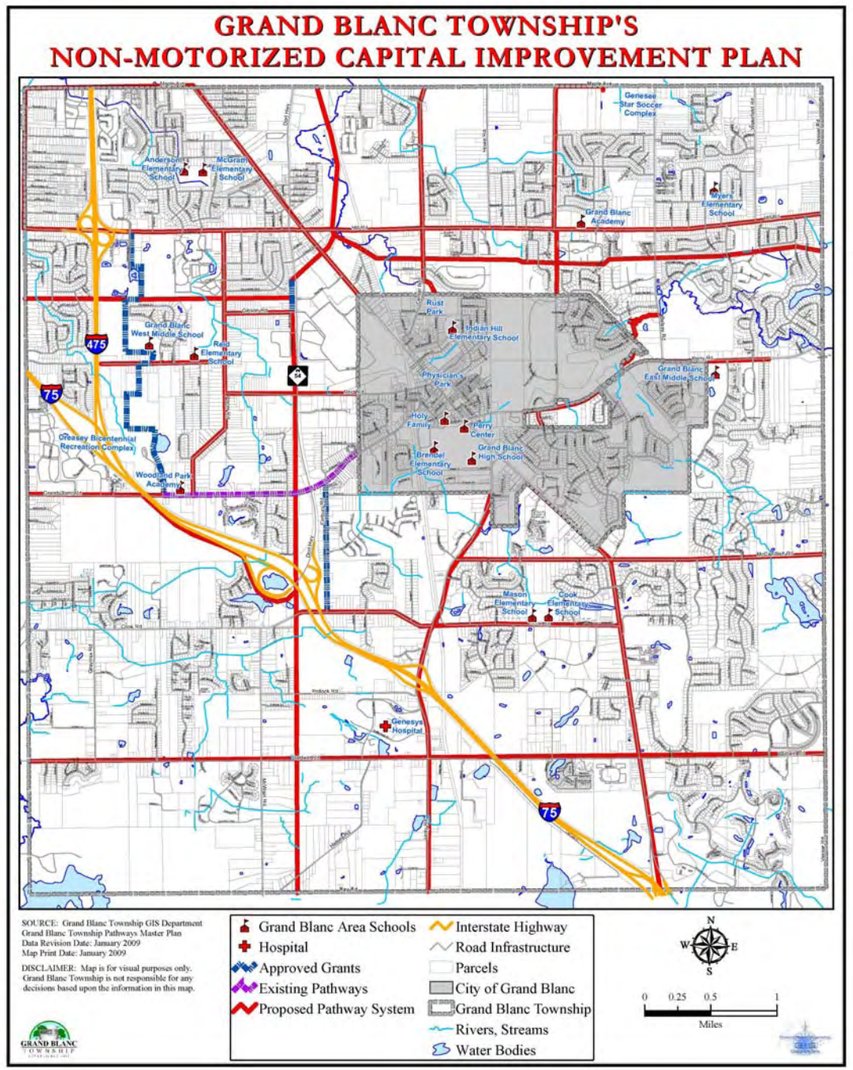
Support for the I-69 International Trade Corridor Next Michigan Development Corporation—Future Partners

Infrastructure & Transit	Private Sector	Workforce Development/Higher Ed	Regional/Global Collaboration	Other Government
• Bishop Airport • Consumers Energy • Genesee County Road Commission • Genesee County Drain Commission (Karegnondi Water Authority) • Indian Trails	• 5/3 Bank • Burton Industries • Diplomat Pharmacy • Landaal Packaging • Lapeer County Bank & Trust • Magna Electronics • Rowe Professional Services • TMI Custom Air Systems	• Baker College—Flint • Baker College—Port Huron • Baker College—Owosso • Michigan Works!/Career Alliance • Mott Community College • St. Clair Community College • Thumb Works! • University of Michigan—Flint	• Blue Water Area Chamber of Commerce • Flint Area Reinvestment Office • Imlay City Chamber of Commerce • Michigan State University Business Connect • Prima Civitas • Sarnia/Lambton Business Development Corporation • Sarnia/Lambton Chamber of Commerce • Sarnia/Lambton Economic Partnership	• City of Linden • Oakland County • United States Congress • United States Senate

APPROVED BY THE PLANNING COMMISSION - AUGUST 1, 2013

Natural Features & Non-Motorized Transportation





APPENDIX N

CONCEPTUAL STAGE RELOCATION PLAN

Conceptual Stage Relocation Plan
(Dort Highway Corridor Extension)

February 14, 2017

GENERAL AREA AND PROJECT INFORMATION

The Genesee County Road Commission (GCRC) is proposing to extend Dort Highway from existing M-54 (Dort Hwy) / I-75 south to Baldwin Road, Grand Blanc Township, Genesee County. A two to three-lane roadway is proposed to facilitate the anticipated increased traffic volumes from the build out of Genesys Health Park and the surrounding area.

Several alternatives were evaluated, which considered the impacts on right-of-way. The preferred alternative does require displacement and relocation. While the alternative route reduces one relocation, there will be a significant increase in impacts to all other properties within the route requiring grading easements and fee take right-of-way.

DISPLACEMENTS

Residential: 3

DISPLACEMENT EFFECTS AND ANALYSIS

Acquisition of property for this project will allow for an orderly and timely relocation of all eligible displaced residents, businesses, farms and nonprofit organizations *(community facilities)*. The acquiring agency will ensure the availability of a sufficient number of replacement properties in the local area for all eligible displacees.

Residential**:** The project may cause the displacement of approximately 3 residential units. A study of the housing market in the project area indicates a sufficient number of replacement homes and rentals will be available throughout the relocation process. It is anticipated that the local residential real estate market will have the capacity to absorb the residential displacements impacted by this project.

ASSURANCES

The acquiring agency will offer assistance to all eligible residents, businesses, farms and non-profit organizations impacted by the project, including persons requiring special services and assistance. The agency's relocation program will provide such services in accordance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; Act 149, Michigan P.A. 1911, as amended; Act 87, Michigan P.A. 1980 as amended, Act 367, Michigan P.A. 2006, as amended; Act 439, Michigan P.A. 2006, as amended; and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. The acquiring agency's relocation program is realistic

and will provide for the orderly, timely and efficient relocation of all eligible displaced persons in compliance with state and federal guidelines.

Prepared by:

_____ **Date:** _____

Fred Peivandi, P.E.
County Highway Engineer

Approved by:

_____ **Date:** _____

APPENDIX O

TRIBAL CONSULTATION LETTERS

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Ms. Paula Carrick, Tribal Historic Preservation Officer
Bay Mills Indian Community
12140 West Lakeshore Drive
Brimley, Michigan 49715

Dear Ms. Carrick:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Bay Mills Indian Community regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Bay Mills Indian Community inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Mr. Jay Sam, Tribal Historic Preservation Director
Little River Band of Ottawa Indians
375 River Street
Manistee, Michigan 49660

Dear Mr. Sam:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Little River Band of Ottawa Indians regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Little River Band of Ottawa Indians inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Mr. Wesley Andrews, NAGPRA-Tribal Historic Preservation Director
Little Traverse Bay Bands of Odawa Indians
7500 Odawa Circle
Harbor Springs, Michigan 49740

Dear Mr. Andrews:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Little Traverse Bay Bands of Odawa Indians regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Little Traverse Bay Bands of Odawa Indians inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Ms. Sydney Martin, MACPRA Representative
Match-e-be-nash-she-wish Band of Pottawatomi Indians
3556 26th Street
Hopkins, Michigan 49328

Dear Ms. Martin:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Match-e-be-nash-she-wish Band of Pottawatomi Indians regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Match-e-be-nash-she-wish Band of Pottawatomi Indians inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

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- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Ms. Lorraine Shananaquet, NAGPRA Representative
Match-e-be-nash-she-wish Band of Pottawatomi Indians
3556 26th Street
Hopkins, Michigan 49328

Dear Ms. Shananaquet:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Match-e-be-nash-she-wish Band of Pottawatomi Indians regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Match-e-be-nash-she-wish Band of Pottawatomi Indians inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Mr. Marcus A. Winchester, Tribal Historic Preservation Officer
Pokagon Band of Potawatomi Indians
P.O. Box 180
Dowagiac, Michigan 49047

Dear Mr. Winchester:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Pokagon Band of Potawatomi Indians regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Pokagon Band of Potawatomi Indians inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Mr. Willie Johnson, Tribal Historic Preservation Officer
Saginaw Chippewa Indian Tribe of Michigan
6650 East Broadway Road
Mount Pleasant, Michigan 48858

Dear Mr. Johnson:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Saginaw Chippewa Indian Tribe of Michigan regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Saginaw Chippewa Indian Tribe of Michigan inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Ms. Colleen Medicine, Cultural Repatriation Specialist
Sault Sainte Marie Tribe of Chippewa Indians of Michigan
523 Ashmun Street
Sault Sainte Marie, Michigan 49783

Dear Ms. Medicine:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Sault Sainte Marie Tribe of Chippewa Indians of Michigan regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Sault Sainte Marie Tribe of Chippewa Indians of Michigan inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Ms. Giiwegiizhigookway Martin, Tribal Historic Preservation Officer
Lac Vieux Desert Band of Lake Superior Chippewa Indians
P.O. Box 249
Watersmeet, Michigan 49969

Dear Ms. Martin:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Lac Vieux Desert Band of Lake Superior Chippewa Indians regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Lac Vieux Desert Band of Lake Superior Chippewa Indians inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Mr. Earl Meshigaud, MACPRA/NAGPRA Representative
Hannahville Indian Community
N-14911 Hannahville, B1 Road
Wilson, Michigan 49896-9717

Dear Mr. Meshigaud:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Hannahville Indian Community regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Hannahville Indian Community inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Ms. Cindy Winslow, Museum Director/MACPRA Representative
Grand Traverse Band of Ottawa and Chippewa Indians
2605 North West Bayshore Drive
Suttons Bay, Michigan 49682

Dear Ms. Winslow:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Grand Traverse Band of Ottawa and Chippewa Indians regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Grand Traverse Band of Ottawa and Chippewa Indians inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Mr. Gary Loonsfoot, Jr., Tribal Historic Preservation Officer
Keweenaw Bay Indian Community
16429 Bear Town Road
Baraga, Michigan 49908

Dear Mr. Loonsfoot, Jr.:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Keweenaw Bay Indian Community regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Keweenaw Bay Indian Community inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

We would appreciate hearing from you or other Tribal authority as soon as possible to discuss this project, and to consult on the planned project work, if you so desire and as you may deem appropriate. Please contact me at 517-335-0878 or by email at firmanl@michigan.gov with any questions and/or to inform us of your interest in this project.

Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

N

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

October 18, 2016

Ms. Beth Moody, Tribal Historic Perservation Officer c/o
Nottawaseppi Huron Band of the Potawatomi
1485 Mno-Bmadzewen Way
Fulton, Michigan 49052

Dear Ms. Moody:

Dort Highway Extension from the
Interchange of I-75 North, Exit 109, to Baldwin Road
Genesee County, Michigan

The Michigan Department of Transportation (MDOT) is writing to invite formal consultation with the Nottawaseppi Huron Band of the Potawatomi regarding the subject work presently being planned by the Genesee County Road Commission, pursuant to the National Environmental Policy Act and National Historic Preservation Act (16 U.S.C. §470 et. Seq. and 36 C.F.R. Part 800, Section 106 as amended).

The proposed work is a new three-lane road, one lane in each direction with a center left turn lane, from the southbound off ramp of I-75 at Dort Highway southerly to Baldwin Road, located in Genesee County. Please refer to the attached figure.

To avoid any potential Tribal, social, cultural, natural and/or economic impacts, MDOT respectfully requests that the Nottawaseppi Huron Band of the Potawatomi inform us of any traditional cultural or religious properties, social and/or economic constraints or other tribal resources that may be known to the Tribe in the subject project area, which could be impacted by this project. All such notifications will be afforded strict confidentiality.

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Sincerely,

Lynnette Firman, P.E.

Lynnette Firman, P.E.
Local Agency Programs

Enclosure

cc: Mr. Fred Peivandi, Genesee County Road Commission

Legend

- Extension Preferred Alternative
- Dort Highway
- Consumers Energy Utility Corridor
- Drain Crossings
- Wetland Boundaries
- Floodplain (A, AE, AO)
- Railroad
- Roadways
- Freeway

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From: Wes Andrews
To: Firman, Lynnette (MDOT)
Subject: Dort Hwy Extension Genesee County
Date: Thursday, November 03, 2016 5:40:21 AM

Dear Ms. Firman,

We have reviewed this project.

There are no known cultural resources associated with our tribe that will be impacted by this undertaking.

Feel free to contact me at any time if you have questions or comments.

Best regards,

Wesley Andrews
THPO & NAGPRA Officer
The Little Traverse Bay Bands of Odawa Indians
7500 Odawa Circle
Harbor Springs, MI 49740

(231) 670-0713

(231) 242-4851 (Fax)

WADETRIM

555 S. Saginaw Street
Suite 201
Flint, MI 48502
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