TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT / FINAL 4(f) EVALUATION

VOLUME 1

Report Chapters 1-5

November 2017

PIN 5470.22
NYS Route 198 (Scajaquada Expressway) Corridor
Grant Street Interchange to Parkside Avenue Intersection
City of Buffalo
Erie County

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

ANDREW M. CUOMO
Governor

CATHY CALHOUN
Acting Commissioner

U.S. Department of Transportation
Federal Highway Administration

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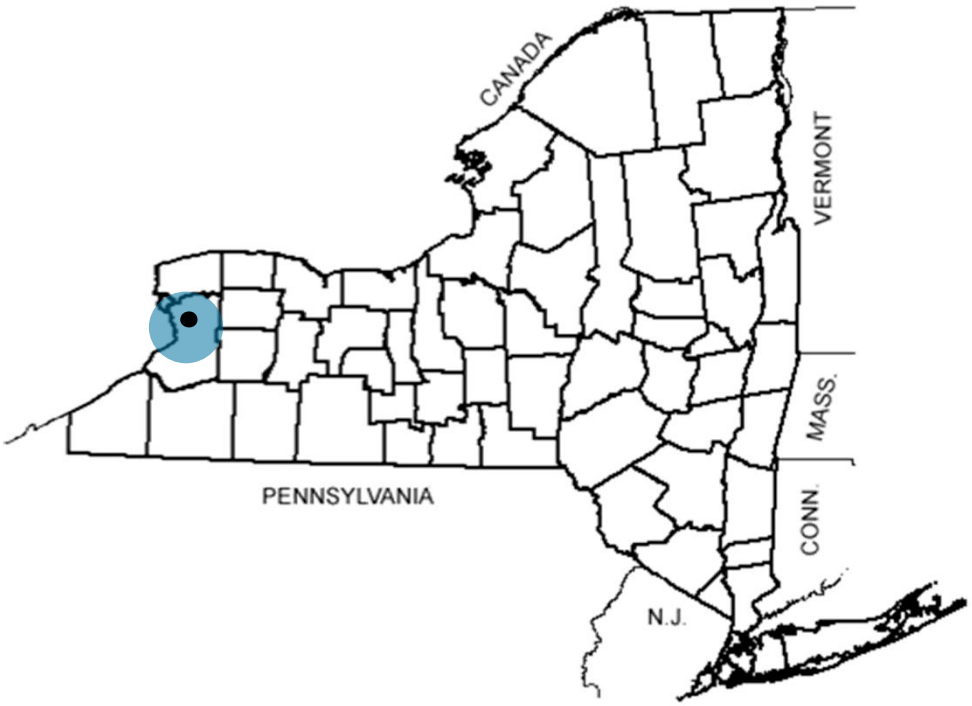

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

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FHWA-NY-EIS-14- 02-F

FINAL DESIGN REPORT/
FINAL ENVIRONMENTAL IMPACT STATEMENT/
FINAL 4(f) EVALUATION

For

P.I.N. 5470.22, NYS ROUTE 198 (SCAJAQUADA EXPRESSWAY) CORRIDOR
GRANT STREET INTERCHANGE TO PARKSIDE AVENUE INTERSECTION
CITY OF BUFFALO, ERIE COUNTY, NEW YORK

SUBMITTED PURSUANT TO 42 U.S.C. 4332(2)(c) and 49 U.S.C. 303

BY

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
NEW YORK STATE DEPARTMENT OF TRANSPORTATION

ABSTRACT: THIS REPORT DESCRIBES THE SOCIAL, ECONOMIC AND ENVIRONMENTAL EFFECTS OF THE NYS ROUTE 198 (SCAJAQUADA EXPRESSWAY) CORRIDOR PROJECT IN THE CITY OF BUFFALO, ERIE COUNTY, NEW YORK. THE ALTERNATIVES PROPOSED INCLUDE THE NO BUILD AND BUILD ALTERNATIVE INVOLVED WITH PROVIDING GEOMETRIC AND OPERATIONAL IMPROVEMENTS TO NYS ROUTE 198 IN ITS CURRENT LOCATION FROM THE GRANT STREET INTERCHANGE TO THE PARKSIDE AVENUE INTERSECTION.

Date 11/6/2017
Wahid Albert, P.E.
Assistant Commissioner and Chief Engineer
New York State Dept. of Transportation

Date 11/7/2017
Peter Osborn
Division Administrator
Federal Highway Administration

This document is available for public review and comments will be received until December 18, 2017; after which time the FHWA and the NYSDOT will issue a joint record of decision.

Comments or questions regarding this FEIS may be sent to scajaquadacorridor@dot.ny.gov or to the individuals noted below:

Craig S. Mozrall, P.E.
Regional Special Projects Manager
NYS DEPT. OF TRANSPORTATION
100 Seneca Street
Buffalo, NY 14203

PHONE: 716-847-3238

Peter Osborn
FHWA, DIVISION ADMINISTRATOR
Leo O'Brien Federal Building
Room 719, 11A Clinton Ave.
Albany, NY 12207

PHONE: (518) 431-4127

PROJECT APPROVAL SHEET

A. IPP Approval:

The project is ready to be added to the Regional Capital Program and project scoping can begin.

The IPP was approved by: ***Alan Taylor, P.E.*** ***6/13/2003***

Regional Director

B. Scope Approval:

The project cost and schedule are consistent with the Regional Capital Program.

The scope was approved by: ***Darrell Kaminski, P.E.*** ***5/11/2016***

Regional Director

C. Public Hearing Certification (23 USC 128):

A public hearing was held on January 25, 2017 in accordance with 23 USC 128.

C L Mignall 11-1-17

Special Projects Manager

D. Recommendation for Design Approval:

The project cost and schedule are consistent with the Regional Capital Program.

Ramsey E. Kolar 11/1/17

Regional Program Manager

E. Recommendation for Design and Nonstandard Feature Approval:

All requirements requisite to these actions and approvals have been met, the required independent quality control reviews separate from the functional group reviews have been accomplished, and the work is consistent with established standards, policies, regulations and procedures, except as otherwise noted and explained.

C L Mignall 11-1-17

Acting Regional Design Engineer

F. Nonstandard Feature Approval:

The nonstandard features have been adequately justified and it is not prudent to eliminate them as part of this project.

Federal Highway Administration

G. Design Approval:

The required environmental determinations have been made and the preferred alternative for this project is ready for final design.

Federal Highway Administration

LIST OF PREPARERS

Group Director Responsible for Production of the Design Approval Document:

Craig S. Mozrall, P.E., NYSDOT, Special Projects Manager,
NYSDOT Region 5

Description of Work Performed:
Directed the preparation of the Design Approval Document in accordance with established standards, policies, regulations, and procedures except as otherwise explained in this document.

This report was prepared by the following NYSDOT staff:

Howard McCulloch, P.E., NYSDOT, Design Services Bureau

Description of Work Performed:
Directly supervised the preparation of traffic modeling for existing and no-build corridor conditions in accordance with established standards, policies, regulations, and procedures except as otherwise explained in this document.

This report was prepared by the following consultant staff:

Mark J. McAnany, P.E., Practice Leader, Bergmann Associates

Description of Work Performed:
Directed the preparation of the Design Approval Document in accordance with established standards, policies, regulations, and procedures except as otherwise explained in this document.

Michael T. Croce, P.E., Senior Project Manager, Bergmann Associates

Description of Work Performed:
Prepared and directly supervised the preparation of the Design Approval Document Chapters 1 through 3, associated data collection, preliminary design, traffic analyses, and the preparation of the non-standard feature justification forms, in accordance with established standards, policies, regulations and procedures, except as otherwise explained in this document.

Joel P. Astyk, P.E., Senior Discipline Specialist, Bergmann Associates

Description of Work Performed:
Directly supervised the structural analysis and design for the Design Approval Document in accordance with established standards, policies, regulations, and procedures except as otherwise explained in this document.

James F. Boggs, Environmental Discipline Specialist, Bergmann Associates

Description of Work Performed:
Directly supervised the preparation of the Final Design Report Chapters 4 and 5 in accordance with established standards, policies, regulations, and procedures except as otherwise explained in this document.

Mark R. Johns, ASLA, Senior Landscape Architect, Bergmann Associates

Description of Work Performed:
Prepared the Visual Impact Assessment (VIA) for the Design Approval Document in accordance with established standard, policies, regulations, and procedures except as otherwise explained in this document.

Heath Lagoe, P.E., Senior Traffic Engineer, Fisher Associates

Description of Work Performed:
Prepared build condition corridor traffic models in accordance with established standards, policies, regulations, and procedures except as otherwise explained in this document.

Note: *It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect, or land surveyor, to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect, or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.*

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TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT / FINAL 4(f) EVALUATION

CHAPTER 1
EXECUTIVE SUMMARY

November 2017

PIN 5470.22
NYS Route 198 (Scajaquada Expressway) Corridor
Grant Street Interchange to Parkside Avenue Intersection
City of Buffalo
Erie County

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

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CHAPTER 1 - EXECUTIVE SUMMARY

1.1. Introduction

The Federal Highway Administration (FHWA), in cooperation with the New York State Department of Transportation (NYSDOT), has prepared this *Final Design Report / Final Environmental Impact Statement / Final 4(f) Evaluation* (FDR/FEIS) for the New York State (NYS) Route 198 (Scajaquada Expressway) Corridor Project (hereafter, "the Scajaquada Corridor Project" or "the project"). The project is located within the City of Buffalo, Erie County, New York. The project is needed to address existing deficiencies along NYS Route 198 related to context and connectivity, operations and geometry, and infrastructure. The purpose of the project is to provide geometric and operational improvements to NYS Route 198 in its current location from the Grant Street interchange to the Parkside Avenue intersection, including the segment through Delaware Park. These improvements would be made while maintaining local connectivity and a critical transportation link between Interstate 190 (I-190) and NYS Route 33 while providing enhanced compatibility with adjacent land uses. The FHWA, serving as the Federal Lead Agency, and NYSDOT, serving as Joint Lead Agency, are progressing the development of the Environmental Impact Statement (EIS).

This FDR/FEIS has been prepared in accordance with the requirements of the Council on Environmental Quality's regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) (40 CFR §1500-1508), the FHWA's *Environmental Impact and Related Procedures; Final Rule* (23 CFR §771), the NYSDOT *Procedures for Implementation of the State Environmental Quality Review Act* (17 NYCRR [New York Codes, Rules and Regulations] Part 15), and the NYSDOT *Project Development Manual*.

The project is classified as a State Environmental Quality Review Act (SEQRA) non-Type II action, indicating that it has the potential for significant environmental impacts or substantial controversy on environmental grounds. However, under 17 NYCRR Part 15, given that a federal EIS is being prepared, NYSDOT and other New York State agencies undertaking a discretionary action for this project have no obligation to prepare an additional EIS under SEQRA. The NYSDOT has given full consideration to the federal Final EIS (FEIS) and will prepare a Record of Decision in accordance with Section 15.9 of 17 NYCRR Part 15. The FHWA will issue a Record of Decision (ROD) document pursuant to CFR 23 771.127 in accordance with Section 1319(b) of the Moving Ahead for Progress in the 21st Century Act (MAP-21), a single FDR/FEIS and ROD document will not be prepared because this FDR/FEIS "makes substantial changes to the proposed action that are relevant to environmental or safety concerns." A separate ROD document will be issued following a 30-day comment period on the FDR/FEIS. Preferred Alternative is identified in **Section 3.2.2.** of this FDR/FEIS.

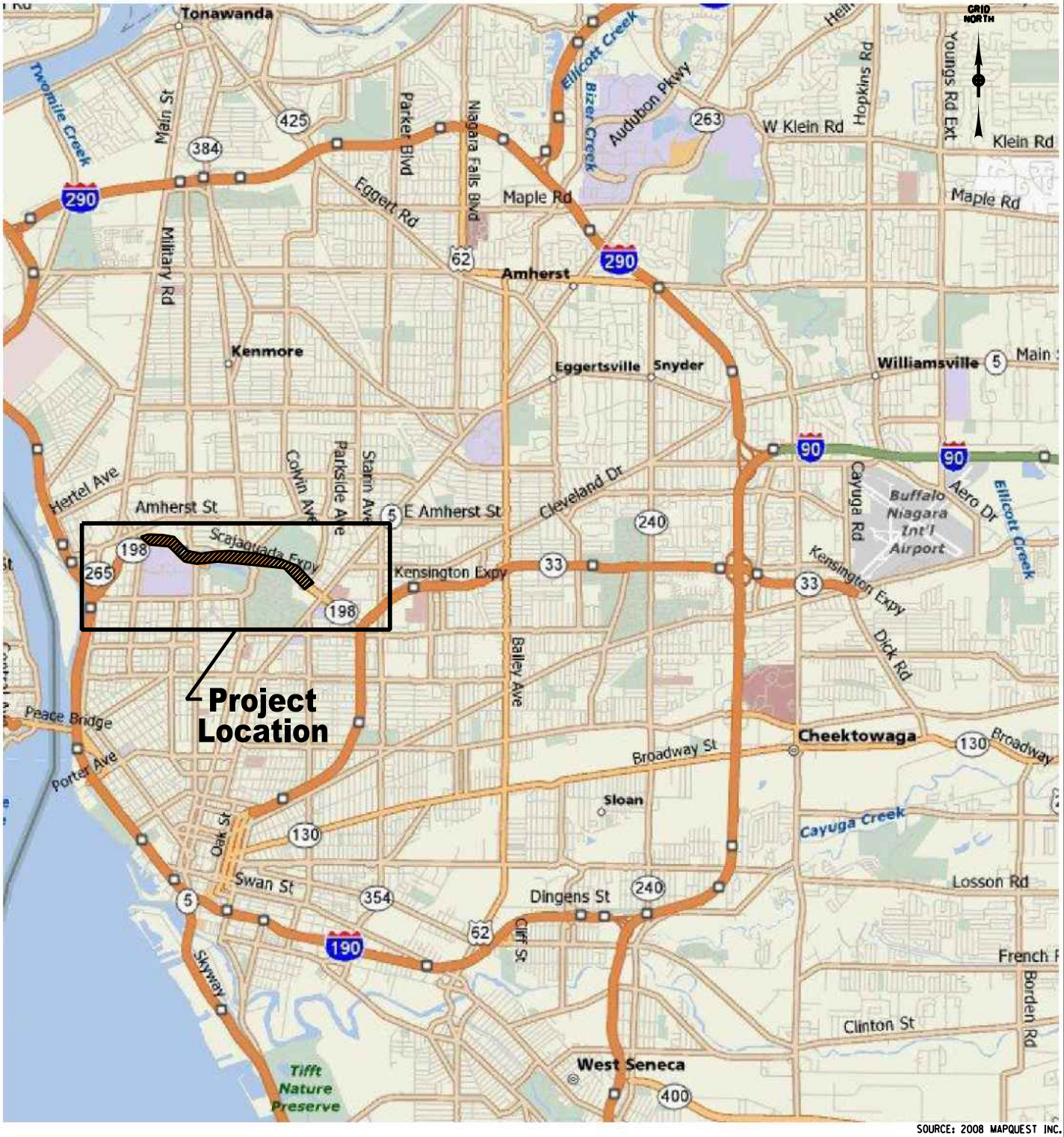
Exhibit 1.1 lists the environmental classifications for this project.

Exhibit 1.1
Environmental Classifications

NEPA Classification:	Class I (EIS)	BY	FHWA
SEQR Type:	Non-Type II (EIS)	BY	NYSDOT

This project is located along a 2.2-mile segment of NYS Route 198 (the Scajaquada Expressway) from the Grant Street interchange to the intersection with Parkside Avenue in the City of Buffalo, Erie County, New York as depicted in **Exhibit 1.1-1.**

The project area (as depicted in **Exhibit 1.1-2**) includes a number of historic, cultural, educational, and commercial establishments. Prominent water features include Scajaquada Creek, Mirror Lake, and Hoyt Lake. The corridor passes through Delaware Park from Elmwood Avenue to Parkside Avenue. The park was one of the first in Buffalo designed by landscape architect Frederick Law Olmsted and is part of a citywide park and parkway system. Roadways crossing the Scajaquada Corridor include Grant Street, Elmwood Avenue, NYS Route 384 (Delaware Avenue), and Parkside Avenue. The Jesse Kregal Pathway is a shared pedestrian and bicyclist facility that runs parallel to the Scajaquada Expressway. The project limits are also shown on **Exhibit 1.1-2**, which are defined as the Grant Street interchange and the Parkside Avenue intersection.



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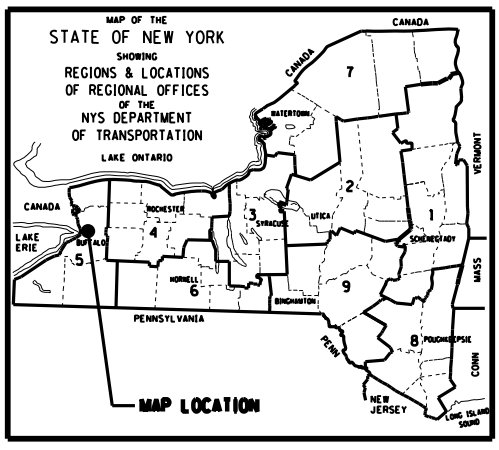

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

NYS Route 198
(Scajaquada Expressway Corridor)
P.I.N. 5470.22

Exhibit 1.1-1
PROJECT LOCATION MAP

SHEET NO.	SCALE	DATE
1 of 1	N.T.S.	9/16

Bergmann associates

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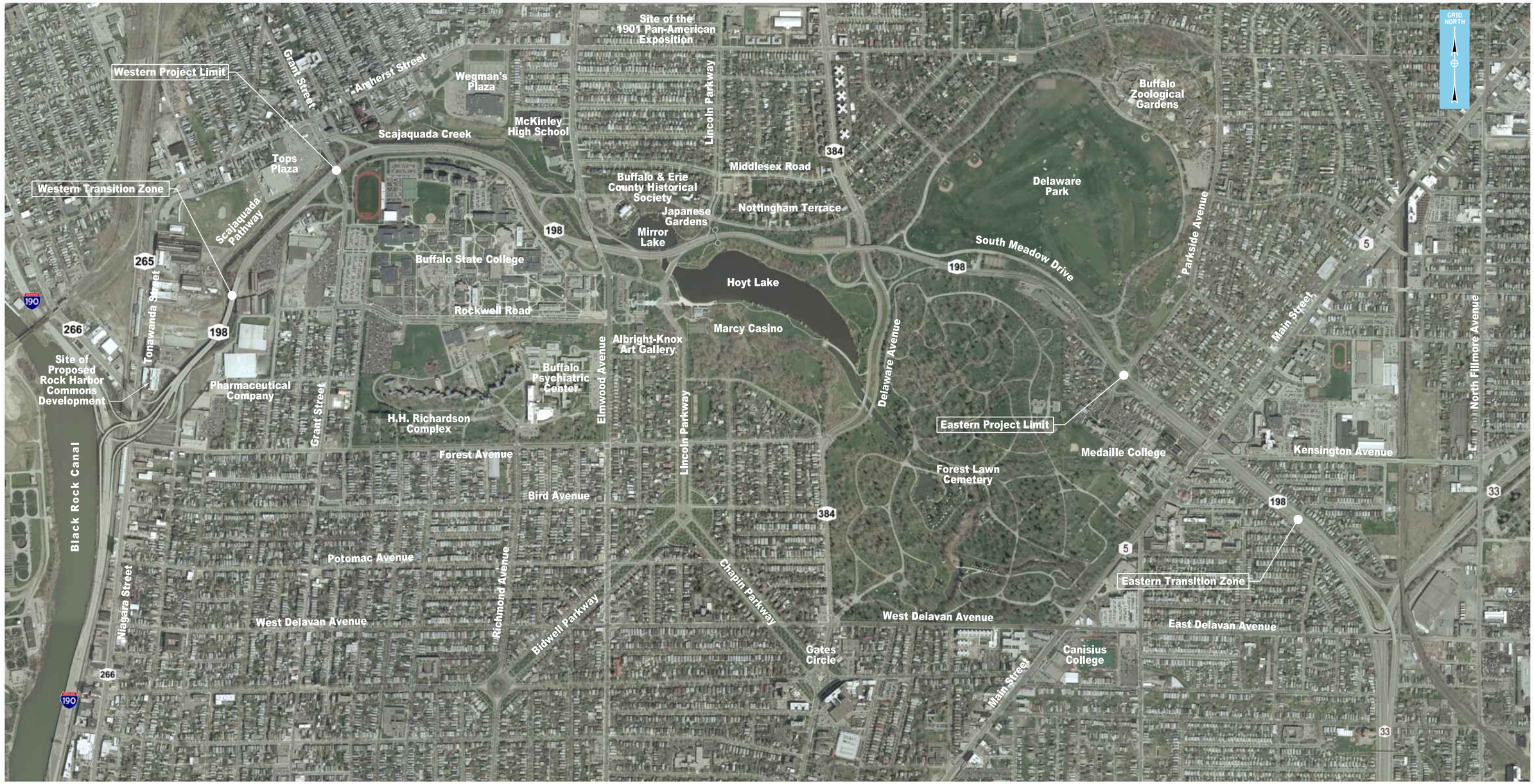

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NEW YORK STATE OF OPPORTUNITY. Department of Transportation

NYS Route 198
(Scajaquada Expressway Corridor)
P.I.N. 5470.22

Exhibit 1.1-2
Project Area Map

SHEET NO.	SCALE	DATE	
1 of 1	AS SHOWN	9/16	Bergmann associates

Below is specific information related to the project's identification and location:

(1) Route number: NYS Route 198

(2) Route name: Scajaquada Expressway

(3) State Highway (SH) number and official highway description:

- SH 58-1 from Reference Marker (RM) 198-5301-1007 to RM 198-5301-1017
- SH 52-7 from RM 198-5301-1017 to RM 198-5301-1027

(4) Bridge Identification Number (BIN) and feature crossed:

- 1039910 – Grant Street over NYS Route 198
- 1039930 – NYS Route 198 Ramp GF over Scajaquada Creek at Grant Street
- 1039940 – NYS Route 198 Ramp GE over Scajaquada Creek at Grant Street
- 1039959 – NYS Route 198 Ramp EC over Scajaquada Creek at Elmwood Avenue
- 1039969 – Elmwood Avenue over NYS Route 198 and Scajaquada Creek
- 1039970 – NYS Route 198 Ramp EK over Scajaquada Creek at Elmwood Avenue
- 1039989 – NYS Route 198 over Scajaquada Creek
- 1039990 – Pedestrian Bridge over NYS Route 198
- 2260460 – Lincoln Parkway over Scajaquada Creek
- 1047259 – NYS Route 198 over Delaware Avenue (NYS Route 384)

(5) City/Village/Township: City of Buffalo

(6) County: Erie

(7) Length: 2.2 miles

(8) From reference marker (RM) 198-5301-1007 to RM 198-5301-1027. Highway reference markers are small green signs located approximately every 0.1 mile along State highways to serve as location references. They are used to track accident data and may also be used to track or identify work locations along the highway.

1.2. Purpose and Need

1.2.1. Project Needs

NYS Route 198, as it currently exists, is paved with wide shoulders, interchanges, and limited pedestrian connectivity between either side of the park. It includes ramps, grade separations, overhead sign structures, median barrier, and other features typical of a freeway, which make the current roadway configuration incompatible with the surrounding community. The expressway is at odds with its rich cultural and recreational surroundings, acting as a physical barrier between the two sides of Delaware Park and adjacent land uses.

The expressway is not compatible with the park and adjacent land uses and geometric and operational deficiencies have been identified throughout the project limits.

The needs for the project are further described as follows:

- ***Context and Connectivity –*** Public discussions over the last 15 years regarding the effect of the controlled-access expressway on the function and context of Delaware Park have led to a decision by the NYSDOT that modifications to the highway facility are needed to better address the competing interests.

NYS Route 198 is of local and regional importance. It is a Qualifying Highway on the National Network of roadways designated by the Surface Transportation Assistance Act of 1982 and is part of the National Highway System. Regionally, NYS Route 198 provides a direct connection between I-190 and NYS Route 33 for motor vehicles and connects residential areas and businesses along the corridor. However, the facility type and scale are not conducive to other modes of transportation, such as bicycling and walking. NYS Route 198 functions as the most convenient, direct route for local traffic going to and from adjacent collector streets and arterial roadways to access Buffalo's regional transportation network. It is used by City of Buffalo residents for short distance travel within and between the City's northern neighborhoods and provides indirect access to numerous commercial, educational, and historic destinations via its interchanges and the Parkside Avenue intersection.

Land uses adjacent to the expressway include recreational, residential, and commercial. Notable features within the corridor include Scajaquada Creek, the Buffalo History Museum, the Japanese Garden, the site of the 1901 Pan-Am Exposition, the Buffalo Zoological Garden, Delaware Park, Buffalo State College, the Albright-Knox Art Gallery, the Marcy Casino, Hoyt Lake, Forest Lawn Cemetery, and Medaille College. The Jesse Kregal Pathway, a shared use path running along the north side of NYS Route 198 from Niagara Street to Delaware Avenue, is located on the north side of Scajaquada Creek and Hoyt Lake. The Jesse Kregal Pathway connects Riverside to Parkside Avenue through Delaware Park. The existing controlled-access expressway bisects the park, separating access to many of the previously-mentioned facilities. Limited opportunities (Grant Street overpass, Elmwood Avenue overpass, a pedestrian bridge near Lincoln Parkway, the Delaware Avenue underpass, and Parkside Avenue at-grade crossings) exist for bicyclists and pedestrians to cross the expressway to access either side. The surrounding land uses generate substantial pedestrian and bicycle trips along and within the vicinity of the corridor. In the one-mile section between Elmwood Avenue and Delaware Avenue, there is only one pedestrian crossing. In the one-mile section between Delaware Avenue and Parkside Avenue, there are no pedestrian crossings. The only connections between the western and eastern sections of the park are the five-foot wide sidewalks on the Delaware Avenue overpass. Based on the origins and destinations previously noted, the current level of bicycle- and pedestrian-accessible accommodations is inadequate based on existing demand. The existing pedestrian bridge over NYS Route 198 does not fully meet accessibility standards as documented in **Section 2.3.2.1**. There is a need to provide additional pedestrian and bicycle crossings and connections that are compatible with the context of the corridor.

- ***Operations and Geometry –*** NYS Route 198 is at present classified as an Urban Principal Arterial Expressway. A mismatch of physical features and driver expectation has resulted in historically higher than statewide average accident rates along the corridor. There is a need to match driver expectation of the corridor with its design and function to enhance the safety and travel experience of all users; therefore, the functionality of the facility needs to be modified.

  The geometry of NYS Route 198 within the project limits has been reviewed against the NYSDOT's minimum standards for making capital improvements. There are non-standard features for 11 different criteria along mainline NYS Route 198 and 9 different criteria along its ramps. Refer to **Section 2.3.3.2** for additional detail on existing non-standard features.

  Radar speed studies undertaken between August 2015 and August 2018 show that on average, traffic on NYS Route 198 operates at speeds in excess of the 30 mile per hour posted speed limit, even with elevated levels of enforcement. Refer to **Section 2.3.1.5** for additional detail on existing speeds. Traffic calming measures are needed to reduce travel speeds along the corridor.

  On May 31, 2015 the Governor of New York State directed the Commissioner of the NYSDOT, in writing, to reduce the posted speed limit along NYS Route 198 to 30 miles per hour (mph), while the Department continued to investigate long-term changes, in response to a fatal accident. The posted speed limit was 50 mph prior to that date.

  Prior to May 31, 2015, acceleration and deceleration lane lengths along NYS Route 198 were considered non-standard for a modern expressway. In the summer of 2015, in an effort to calm traffic and provide better operational support for the lowered posted speed limit, the NYSDOT removed the

acceleration and deceleration lanes between Grant Street and Parkside Avenue, converting these intersections to stop sign-controlled entrances. The existing geometry of the entrance ramps is not optimal for a stop sign-controlled configuration. Modifications to the geometry of these entrance ramps would improve the sight lines for traffic entering the roadway and reduce the frequency of accidents.

Features inconsistent with expressway design standards and incompatible speeds have historically resulted in points of peak hour traffic congestion and higher than statewide average accident rates along NYS Route 198. Traffic congestion continues to occur on the corridor at the Delaware Avenue interchange and Parkside Avenue intersection during peak periods. Prior to 2015, more than one-half of all mainline, weaving, ramp junction, and intersection areas along the expressway had accident rates higher than experienced statewide. The expressway had six identified High Accident Locations within the project limits. Approximately one-third of all collisions resulted in at least one personal injury. Accident data for the period from June 2015 to October 2015 were reviewed to assess conditions after the change to a 30 mile per hour posted speed limit. Refer to **Section 2.3.1.8 (2)** for a summary of that analysis.

- ***Infrastructure* –** The existing closed drainage system is failing. The system includes misaligned pipes and deteriorated inlets that are difficult to maintain, leading to plugging by debris and isolated flood events. Untreated stormwater can also be released into Scajaquada Creek. The pavement consists of an asphalt overlay on a concrete base. The pavement requires a 10 to 15-year cycle of milling and resurfacing to stay in good condition. Horizontal clearance to light poles along the corridor is inadequate. As a result, poles have been knocked down, raising both safety and maintenance concerns.

In summary, there is a need to:

- Improve the compatibility of the roadway with its surroundings;
- Maintain the critical transportation link between I-190 and NYS Route 33;
- Maintain local connectivity for all modes of travel;
- Correct geometric features that do not meet current design standards;
- Reduce the disparity between vehicular operating speeds, the posted speed limit, and the design speed;
- Address historically higher than statewide average accident rates, accident severity, and identifiable accident patterns; and
- Rehabilitate or replace the pavement, drainage system, and lighting.

1.2.2. Project Purpose and Objectives

1.2.2.1. Project Purpose

The purpose of the project is to provide geometric and operational improvements to NYS Route 198 in its current location from the Grant Street interchange to the Parkside Avenue intersection, including the segment through Delaware Park. These improvements will be made while maintaining local connectivity and a critical transportation link between I-190 and NYS Route 33, and providing enhanced compatibility with adjacent land uses.

1.2.2.2. Project Objectives

The following objectives have been established to further refine the project purpose:

- Address identified geometric and operational deficiencies along NYS Route 198 in a manner that promotes traffic calming and enhances safety for users;
- Accommodate vehicular, bicycle, and pedestrian travel modes within the project corridor;
- Improve connectivity between both sections of Delaware Park on either side of the roadway and between the park and adjacent neighborhoods;
- Enhance the compatibility of the roadway with the unique characteristics of Delaware Park and adjacent land uses while conserving the natural features of the site to the greatest extent possible; and
- Address identified infrastructure deficiencies, such as deteriorated pavement, antiquated and non-functioning drainage systems, and inefficient street lighting, within the project limits.

1.3. Project Alternatives

Based on the project purpose, objectives, needs, and public input, the alternatives below were developed for study in the Draft Design Report / Draft Environmental Impact Statement (DDR/DEIS) and the Final Design Report / Final Environmental Impact Statement (FDR/FEIS).

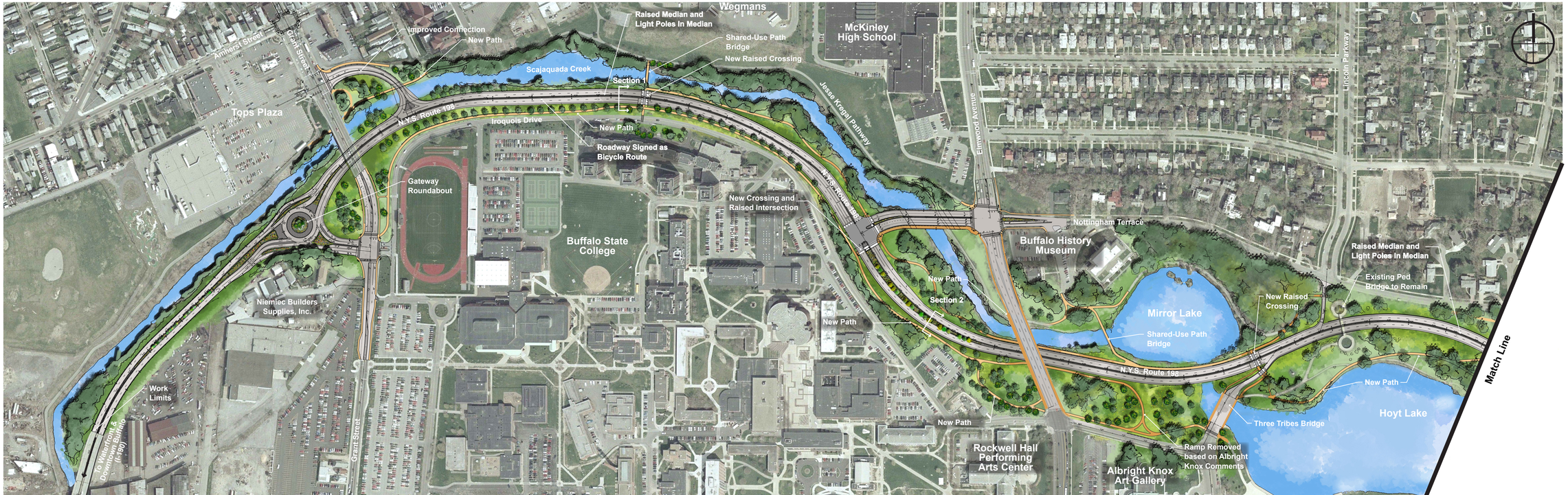
Alternative 1: No-Build Alternative

The No-Build Alternative assumes no improvements in the project limits other than those planned by others or implemented as part of routine maintenance. Although the No-Build Alternative does not meet the project purpose and objectives, NEPA requires that it be included in an EIS to serve as the baseline condition against which the Build Alternative(s) are evaluated.

Alternative 2: Boulevard (Build Alternative)

The Build Alternative would transform NYS Route 198 from an urban expressway into an urban boulevard with two travel lanes in each direction between the Grant Street interchange and Parkside Avenue intersection in its current location. The urban boulevard would allow for additional access at intersections and to abutting land uses. A conceptual rendering of the Build Alternative is provided in **Exhibit 1.3-1** Additional renderings and illustrative cross sections are provided in **Exhibit 1.3-2** through **Exhibit 1.3-8**. Refer to **Appendix A2** for detailed plans, profiles, typical sections, and select cross-sections for the Build Alternative. Design modifications made to the Build Alternative between the publication of the Draft Design Report and Environmental Impact Statement (DDR/DEIS) and the Final Design Report and Environmental Impact Statement (FDR/FIES) include the following:

- The wide planted median has been eliminated between intersections and replaced with a 4-foot-wide, 20-inch high, and hardscaped median edged with an aesthetically treated low-profile concrete barrier. Planted medians would be provided in areas that are wide enough to accommodate them;
- 5-foot-wide shoulders have been added to NYS Route 198. The roadway would be signed as a bicycle route and bicyclists would have the option of sharing the vehicular travel lanes or riding on the shoulder after the functional classification is changed from an urban expressway to an urban minor arterial.



NEW YORK STATE OF OPPORTUNITY. Department of Transportation

PREFERRED ALTERNATIVE | WEST

SEPTEMBER, 2017

NYS ROUTE 198 | SCAJAQUADA CORRIDOR PROJECT

Exhibit 1.3-1

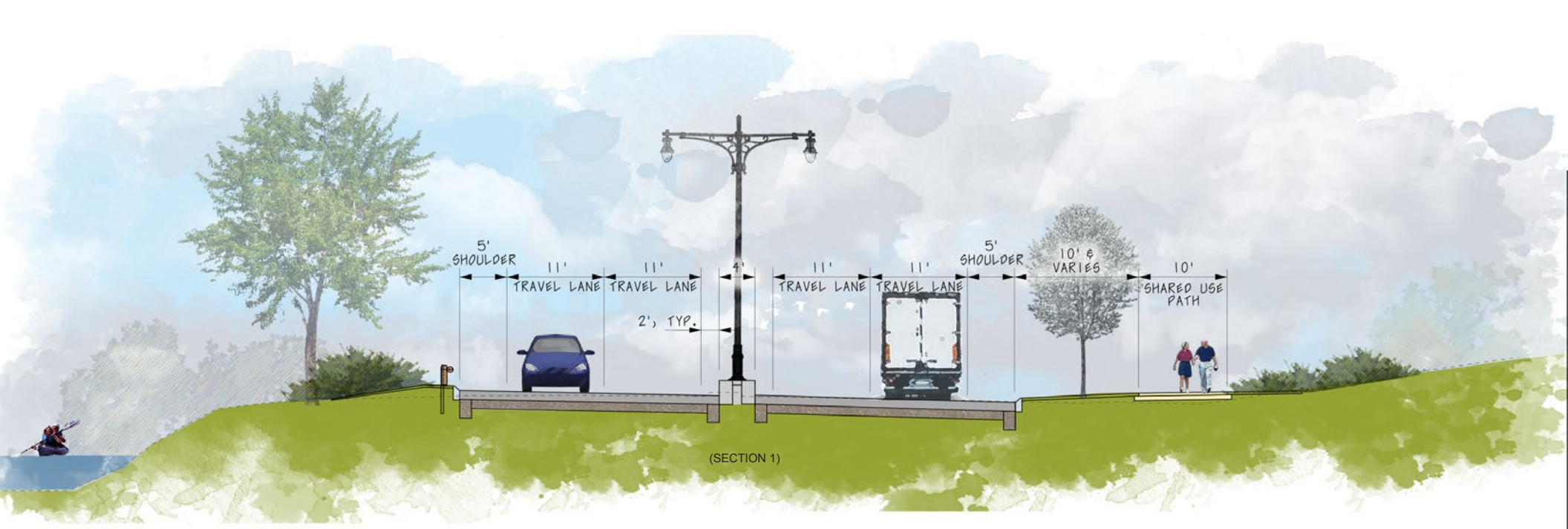
NEW YORK STATE OF OPPORTUNITY. Department of Transportation

PREFERRED ALTERNATIVE | EAST

SEPTEMBER, 2017

NYS ROUTE 198 | SCAJAQUADA CORRIDOR PROJECT

Exhibit 1.3-1



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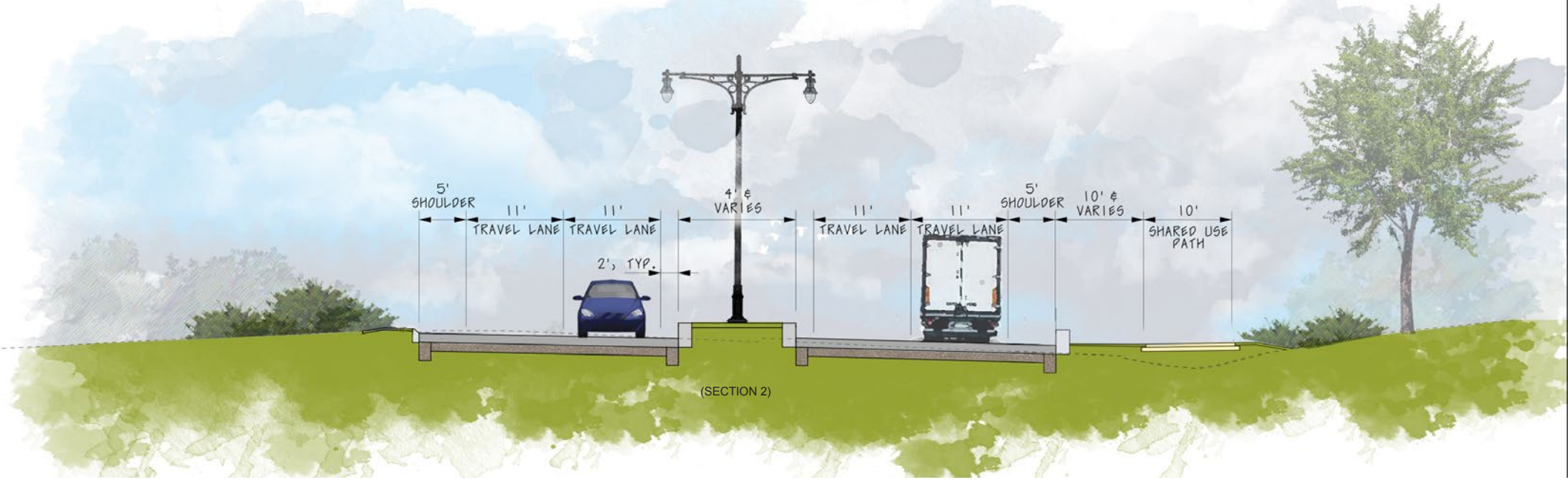


(SECTION 2)

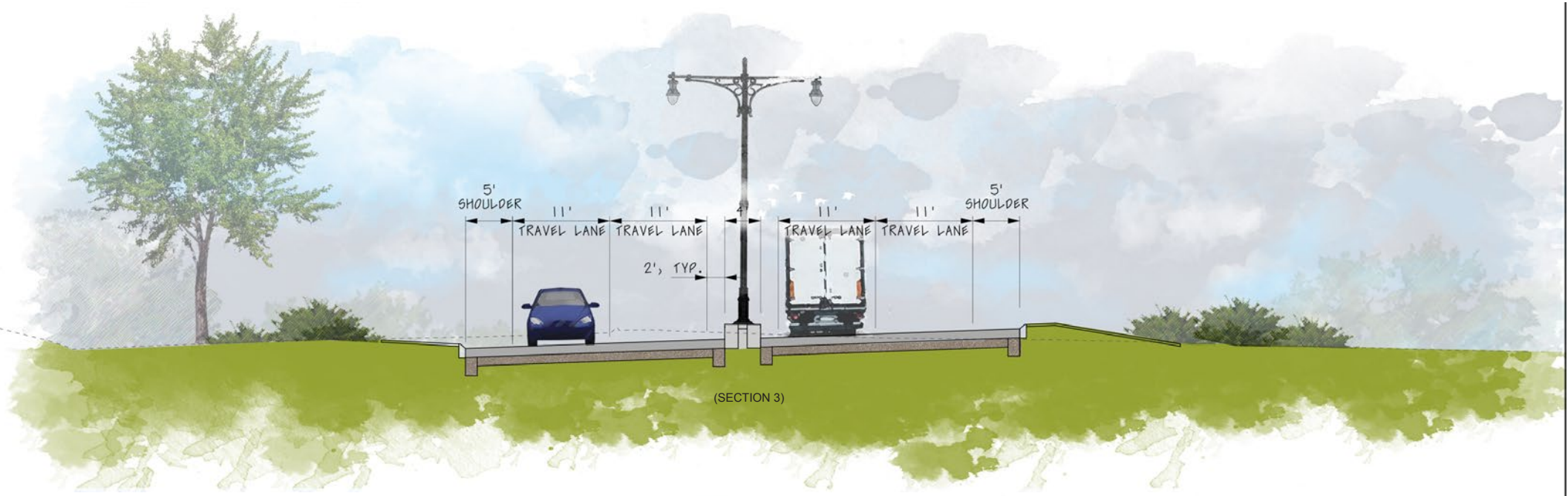
NEW YORK STATE OF OPPORTUNITY. Department of Transportation

SEPTEMBER, 2017

Bergmann associates
architects // engineers // planners

NYS ROUTE 198 | SCAJAQUADA CORRIDOR PROJECT

Exhibit 1.3-2 | Concept Typical Sections (1 of 3)



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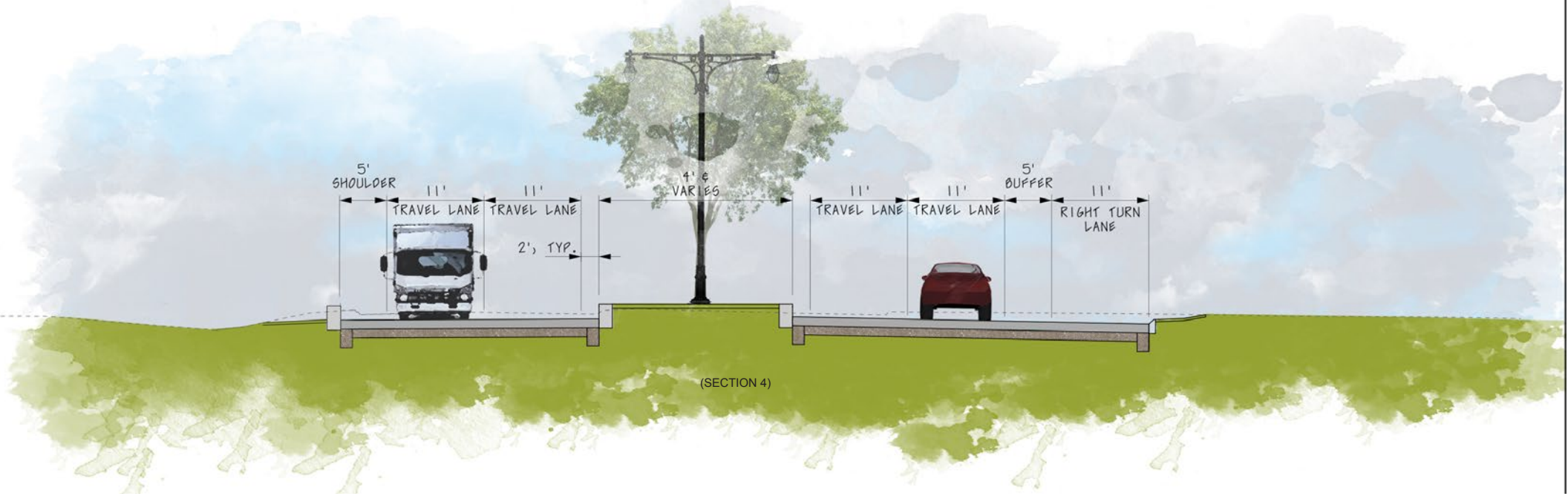

(SECTION 4)

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

SEPTEMBER, 2017

Bergmann associates
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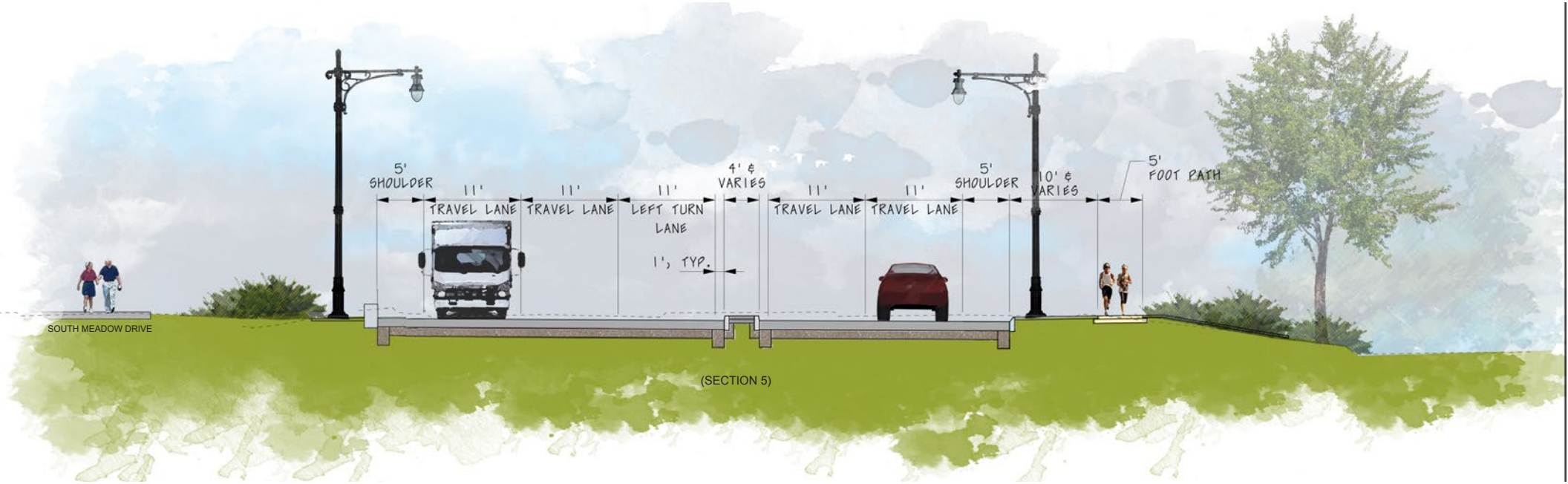
NYS ROUTE 198 | SCAJAQUADA CORRIDOR PROJECT

Exhibit 1.3-3 | Concept Typical Sections (2 of 3)



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NYS ROUTE 198 | SCAJAQUADA CORRIDOR PROJECT

Exhibit 1.3-4 | Concept Typical Sections (3 of 3)

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NYS ROUTE 198 | THE SCAJAQUADA PROJECT

Exhibit 1.3-5 | Parkside Avenue Intersection Concept | View Looking South from Delaware Park

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Exhibit 1.3-6|Delaware Park | View Looking South Toward Forest Lawn Cemetery

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NYS ROUTE 198 | THE SCAJAQUADA PROJECT

Exhibit 1.3-7 | Hoyt Lake Crossing | View Looking Northeast Toward Delaware Avenue

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NYS ROUTE 198 | THE SCAJAQUADA PROJECT

Exhibit 1.3-8 | Buffalo State Crossing Concept | Looking West

- The geometry of the entrance and exit to the Delaware Park parking area, along with the alignment of an adjacent shared use path, has been modified to mimic the historic shape of Agassiz Circle and the historic Delaware Park entrance;

- The northern Lincoln Parkway Connector has been redesigned to reduce its width where it meets NYS Route 198 and to include a raised pedestrian crossing at the Jesse Kregal Pathway;

With respect to traffic control, ramps at Grant Street, Elmwood Avenue, and Delaware Avenue would be replaced with connecting roadways. At-grade intersections with traffic control (stop signs, signals, or roundabouts) would be constructed where each connecting roadway meets NYS Route 198. The roundabout would be constructed on NYS Route 198 near Grant Street. Parkside Avenue would remain a signalized intersection. A new signalized intersection would be created at the entrance to the City of Buffalo Parks Maintenance Facility. New signalized shared use path crossings would also be added near Buffalo State College, Mirror Lake, and Hoyt Lake.

All crossings and intersections along NYS Route 198 would be raised approximately 4 inches above the surrounding pavement to encourage appropriate vehicular operating speeds and enhance pedestrian safety. Traffic signals along NYS Route 198 would operate as an actuated- (by vehicles and pedestrians) coordinated system during peak traffic periods except for the Parkside Avenue signal, which would be actuated but not coordinated given multiple approaches with heavy volumes. During off-peak times, all signals could be operated as part of a pre-timed, coordinated system designed to encourage a vehicular speed of 30 miles per hour. New shared use paths and foot paths would be constructed at several locations along NYS Route 198 from Grant Street to Parkside Avenue resulting in both additional crossing opportunities and a separate, parallel, off-roadway system for pedestrian bicyclist accommodation throughout the project limits. NYS Route 198 would be signed as a bicycle route from Grant Street to Parkside Avenue.

Upon project completion, the NYSDOT would pursue changing the functional classification of NYS Route 198 from an Urban Principal Expressway to an Urban Minor Arterial. The Build Alternative would accommodate motor vehicles, bicyclists, and pedestrians. The roadway design would conform to accepted standards for an urban arterial. Delays (typically corresponding to no greater than Level of Service (LOS) D with some locations reaching LOS E by the design year, 2040) would be introduced at signalized intersections during rush hour in comparison to free flow conditions previously experienced along the expressway. Refer to **Sections 2.3.1.7** and **3.3.1.7** for more detail on current and projected traffic operations. Public input received to date is supportive of some additional delay in order to provide a facility that is more compatible with the park.

Refer to **Appendix C1** and **Appendix C2** for a tabulation of traffic analysis results. Documented deficiencies of the existing drainage system would be addressed by replacing much of the system. Driver expectation of the facility and its design would be aligned, enhancing overall safety. Additional and enhanced pedestrian and bicycle crossing opportunities would be created near Buffalo State College, Elmwood Avenue, Lincoln Parkway, Hoyt Lake, Delaware Avenue, Delaware Park, and at Parkside Avenue.

The parameter “design speed” is used to guide the selection of other criteria that shape the geometric features of a roadway. A design speed is typically set considering context, such as classification of the roadway, the type and volume of traffic using the roadway, topography, surrounding land use, and the character of adjacent roadway segments. The design speed for this project would be set at 35 mph between Grant Street and Parkside Avenue. The current 30 mph posted speed limit would be retained within those limits.

Details of the Build Alternative have been evaluated and optimized throughout preliminary design, including intersection type; lane widths; medians; the use of guiderail and concrete barriers; curb offsets; bicycle and pedestrian accommodations (e.g., shared-use paths, separate bikeways, bicycle routes); and landscaping/context sensitive features. Refer to **Chapter 3** for a detailed discussion of design elements of the Build Alternative.

1.4 Environmental Considerations

1.4.1. General Environmental Considerations

The Scajaquada Corridor Project would comply with applicable environmental legislation and regulations as well as NYSDOT policies and procedures. Permits, approvals, and agency consultation that are anticipated for the project are identified below.

U.S. Department of Transportation, FHWA
- Determination under Section 106 of the National Historic Preservation Act of 1966
- Determination under Section 4(f) of the U.S. Department of Transportation Act of 1966
- Determination under Section 7 of the Endangered Species Act

U.S. Environmental Protection Agency (USEPA)
- NEPA Coordination
- Coordination under Section 404 of the Clean Water Act

U.S. Army Corps of Engineers (USACE)
- Clean Water Act
- Section 404 Nationwide Permit #3 - Maintenance Activities in all Waters of the U.S.
- Section 404 Nationwide Permit #14 - Linear Transportation Projects

U.S. Department of the Interior, US Fish and Wildlife Service (USFWS)
- Consultation under Section 7 of the Endangered Species Act

U.S. Department of the Interior, National Park Service (NPS)
- Approval under Section 6(f) of the Land and Water Conservation Fund Act

NYS Office of Parks, Recreation and Historic Preservation: State Historic Preservation Office (SHPO)
- Consultation under Section 106 of the National Historic Preservation Act of 1966
- Section 4(f) coordination as official with jurisdiction for historic sites

NYS Office of Parks, Recreation and Historic Preservation: State Parks
- Consultation under Section 6(f) of the Land and Water Conservation Fund Act

New York State Department of Environmental Conservation (NYSDEC)
- State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Activities from Construction Activities (Permit No. GP-0-15-002)
- Clean Water Act
- Section 401 Water Quality Certification
- Coordination pursuant to the “NYSDEC/NYSDOT Memorandum of Understanding Regarding ECL Article 15 & 24”
- Coordination for threatened and endangered species (Natural Heritage Program)

New York State Department of State (NYSDOS)
- Coastal Zone Consistency Determination

1.4.2. Environmental Methodology

- **Study Area**. The study area for each analysis was developed based on appropriate protocols under NEPA and related laws, regulations, and NYSDOT procedures, and varied depending on the particular topic. For example, the study area for topics such as wetlands and surface waterbodies and watercourses includes the project corridor and those areas immediately adjacent to the corridor. The study area for topics related to changes in traffic, such as noise, air quality and energy, includes areas that have a potential to experience change as a result of traffic diversion.

- **Analysis Years**. The years of study for analyses were chosen based on standard NEPA protocols and NYSDOT procedures and varied depending on the particular topic. For example, the analysis of socio-economic issues, including environmental justice, used year 2010 population, housing, and income data from the U.S. Census Bureau, supplemented by available updated information, for demographic and economic profiles of the study area. For the noise analysis, the design year (Estimated Time of Completion + 20 years) was modeled, in accordance with the NYSDOT Noise Policy. For the air quality mesoscale analysis, the Estimated Time of Completion (ETC), ETC + 10 years and ETC + 20 years were modeled.

- **Assessment Methodology and Impact Criteria**. The methodologies used in preparing this FDR/FEIS adhere to the FHWA Technical Advisory T6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (October 30, 1987), and the procedures in the NYSDOT *Environmental Manual (TEM)*. The FDR/FEIS includes an assessment of the social, economic, and environment effects of the Build Alternative on the built and natural environments, using the No Build Alternative as a baseline for comparison.

1.4.3. Build Alternative Effects

The effects of the Build Alternative on social, economic and environmental conditions were assessed and are described in **Chapter 4**. The following categories were assessed:

- Social
- Economic
- Wetlands
- Surface Waterbodies and Watercourses
- Wild, Scenic and Recreational Rivers
- Navigable Waters
- Floodplains
- Coastal Resources
- Groundwater Resources
- Stormwater Management
- General Ecology and Wildlife Resources, including Endangered and Threatened Species
- Historic and Cultural Resources
- Parks and Recreational Resources
- Visual Resources
- Farmlands
- Air Quality
- Energy
- Noise
- Asbestos
- Hazardous Waste and Contaminated Materials
- Indirect and Secondary Effects
- Cumulative Effects

The effects of the Build Alternative are summarized in **Exhibit 1.4.**

Exhibit 1.4
Summary of Effects of the Build Alternative

Category	Build Alternative
Environmental Justice	No disproportionately high adverse effects on minority or low-income populations
Surface Waterbodies & Watercourses	Up *to 0.04 acres of* fill for bridge work
Floodplains	No effects
Coastal Resources	No effects
Stormwater Management	16% decrease in net impervious area 9 to 59% decrease in pollutant loadings
Habitat	Removal of up to 346 trees on 78 acres
Endangered and Threatened Species	May Affect, Not Likely to Adversely Affect the threatened Northern Long-eared Bat
Section 106 - Historic and Cultural Resources	Adverse Effect on four archaeological sites
Section 6(f) - Parks and Recreational Resources	Conversion of 2.7 acres from parkland use to highway use Replacement of 5.6 acres from highway use to parkland use Net benefit = 2.9 acres of parkland
Section 4(f) - Historic Properties / Parks and Recreational Resources	2.7 acres of permanent use 14.2 acres of temporary use
Visual Resources	Overall positive visual effect to the project area's visual resources
Air Quality	Negligible change[1]
Energy	Negligible change[2]
Noise	Noise impacts were identified at six receiver locations, though no perceptible change in noise would occur[3]
Contaminated Materials	Additional investigations may be required for 5 of the 42 sites of concern identified
Traffic Operations	2-minute increase in travel time from I-190 to NYS Route 33 Anticipated 5% diversion to adjacent city streets[4] Three of 37 intersections with one or more traffic movements[5] at LOS[6] E or F
Right-of-Way	17 separate parcels involved 1.80 acres of property acquisitions 1.58 acres of permanent easements 17.05 acres of temporary easements 1.02 acres of concurrent use and occupancy permits

Notes:

1. The results of the mesoscale analysis indicate that, in all analysis years (ETC, ETC+10, ETC+20), emission burdens of VOCs are slightly higher (by 0.1%) under the Build Alternative, when compared to that under the No-Build. Emission burdens of NOx, CO, PM10 and PM2.5 are slightly lower (by -0.1% to -2.2%) under the Build Alternative, when compared to that under the No-Build. In all analysis years, mobile source air toxics are slightly lower (by -1.7% to -5.7%) under the Build Alternative, when compared to that under the No-Build. The results of the PM microscale analysis show that no exceedances of the PM National Ambient Air Quality Standards are predicted and concentrations of $PM_{2.5}$ and PM_{10} are lower under the Build Alternative as compared to that under the No-Build Alternative.
2. Direct energy and greenhouse gas emissions would be slightly lower under the Build Alternative as compared to that under the No-Build. When added to indirect energy, the analysis shows slightly higher (1-2%) total energy and greenhouse gas emissions under the Build Alternative over the analysis years.
3. No receptor would experience a noise level increase greater than 2 dBA over the existing noise level, which is barely perceptible by the typical person.
4. Mitigation for the effects of the traffic diversion is described in **Section 3.3.1.7 (1)**.
5. Traffic movements can refer to a single movement (e.g., a left turn) or a set of movements (e.g., a group of lanes shared by through and right turn movements) at an intersection.
6. LOS = Level of Service

1.5. Project Costs and Schedule

As noted in **Exhibit 1.5-1**, Design Approval is expected by October 2017. Detailed design and construction phases would follow. Construction is likely to be broken into two construction contracts. Contract 1 would rebuild NYS Route 198 from the Elmwood Avenue interchange to the Parkside Avenue intersection. Contract 2 would construct the remainder of NYS Route 198, centering around the Grant Street interchange.

Exhibit 1.5-1
Project Schedule

Activity	Date Occurred/Tentative
Scoping Document Approval	May 2016
Public Notice of Availability of the DDR/DEIS	November 2016
Public Hearing	January 2017
Release of FDR/FEIS	October 2017
Record of Decision (ROD)	December 2017
Design Approval	January 2018
ROW Acquisition	October 2017 - January 2018
Contract 1 Letting (Bid Opening)	May 2018
Contract 1 Construction	August 2018 – December 2020
Contract 2 Letting (Bid Opening)	November 2021
Contract 2 Construction	March 2022– July 2023

Notes to Exhibit 1.5-1:
DDR/DEIS: Draft Design Report and Environmental Impact Statement
FDR/FEIS: Final Design Report and Environmental Impact Statement
Contract 1: Elmwood Avenue interchange to the Parkside Avenue intersection
Contract 2: Grant Street interchange
ROW = Right of Way

Exhibit 1.5-2 summarizes the anticipated project costs. Refer to **Section 3.2.1** for a more detailed breakdown of anticipated project costs.

Exhibit 1.5-2
Build Alternative Project Costs (2017 Dollars)

Activities	Build Alternative
Construction Cost (2017 Dollars)	$75,954,000
Contingencies, Incidentals, and Field Change Payments	$22,579,000
Subtotal (2017 Dollars)	$98,533,000
Anticipated Inflation (Through 2020)	$5,401,000
Total Construction Cost	**$103,934,000**

1.6. Preferred Alternative

The FHWA and NYSDOT have identified the Build Alternative (Alternative 2: Boulevard) as the preferred alternative for the project. The selected alternative will be identified in the Record of Decision in consideration of comments received on the DDR/DEIS, at the public hearing, and on this FDR/FEIS.

1.7. Public Involvement and Agency Coordination

1.7.1 Introduction

Public participation is an integral part of the NEPA and SEQRA processes, as well as other parallel processes, including the Environmental Justice, Section 106, Section 4(f), and Section 6(f) processes. The FHWA and NYSDOT have provided and will continue to provide opportunities for meaningful public and agency participation throughout the environmental review process.

The FHWA and NYSDOT prepared a Coordination Plan in accordance with federal transportation law to outline the process for engaging the public and agency coordination (see **Appendix B2**). The plan is consistent with the most recent federal transportation reauthorization law, Fixing America's Surface Transportation (FAST) Act of 2015, which carries forward the public involvement principles of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005. Refer to **Appendix G** for a summary of public involvement efforts and copies of meeting minutes. **Appendix G** contains the most recent information available at the time of publication. Public and agency involvement opportunities are summarized below.

1.7.2 Public Involvement Activities

The FHWA and NYSDOT have engaged and will continue to engage members of the public through various meetings and other forums. Opportunities for public review have and will continue to include the outreach efforts described below.

Public Meetings and Comment Periods – To date, the public has been engaged through multiple information meetings (listed in **Exhibit 1.7.2**). Presentations were given and informational displays provided in each case. NYSDOT representatives were on hand to listen, explain, and receive comments from the public. Written comments were accepted both at and after each meeting. Project documents have been and will continue to be made available on the project's website.

Exhibit 1.7.2
Public Information Meeting Summary

Meeting	Date	Description
NEPA Scoping Meeting	November 28, 2007	Introduced the public to the project, solicited comments on the proposed Purpose and Need Statement, obtained input on environmental resources, and described an intended schedule.
Interactive Design Workshop #1	September 16, 2009	Working session to discuss ideas, options, and preferences for the segment from I-190 through the Grant Street interchange
Interactive Design Workshop #2	November 4, 2009	Working session to discuss ideas, options, and preferences for the segment from Parkside Avenue to NYS Route 33
Interactive Design Workshop #3	April 29, 2010	Working session to discuss ideas, options, and preferences for the segment from Elmwood Avenue through Delaware Park
Public Information Meeting with Assemblyman Ryan	April 9, 2014	Provided an update on project status, outlined a vision for transformation of the corridor, and offered an opportunity for questions and answers moderated by Assemblyman Ryan.
Public Information Meeting	September 16, 2015	Summarized the assessment of two new potential alternatives that were requested at the April 9, 2014 meeting. NYSDOT representatives answered questions that were submitted by the public.
Public Information Meeting	February 10, 2016	Summarized the anticipated Build Alternative and provided an updated project schedule.
Public Open House	May 19, 2016	Provided multiple displays illustrating options under consideration. Displays were available for viewing by the public and NYSDOT representatives were present to answer questions.
Public Information Meeting/Hearing	January 25, 2017	Present and obtain input on the Build Alternative and assessment of effects in the DDR/DEIS
Public Information Meeting	August 8, 2017	Present changes to the Preferred Alternative since publication of the DDR/DEIS

The scoping comment period extended through February 26, 2016. Comments received during that period were included in the Scoping Report. Transcriptions of substantive public comments directly related to the project and received prior to September 1, 2016 (including those received during the scoping period) are included in **Appendix H** of this report. Comment summaries, grouped by similar topic, are also available along with responses in **Appendix H**.

The next opportunity for public participation following the publication of the DDR/DEIS in November 2016 was a public hearing held on January 25, 2017. A formal notice of the public hearing was published in local newspapers in accordance with the provisions of Title 23, U.S. Code, Section 128 and Title 40, Code of Federal Regulations, Parts 1500 to 1508. All interested parties were given the opportunity to

express their views concerning the design plans, their impact on the environment, and their consistency with the goals and objectives of such planning as has been promulgated by the community. The proceedings were recorded. Official transcripts of the proceedings are available in **Appendix G**. Comments received at the public hearing and during the DDR/DEIS comment period, which ended on February 8, 2017, have been considered and responded to, as appropriate, in this Final Design Report/ Final Environmental Impact Statement / Final 4(f) Evaluation (FDR/FEIS). Comments received on the DDR/DEIS and at the public hearing are included in **Appendix H** along with summaries and responses grouped by similar topic.

The public was given an opportunity to review changes made to the Preferred Alternative since publication of the DDR/DEIS at a public information meeting held on August 8, 2017. Comments on the revised proposal were accepted through September 9, 2017 and have been considered and responded to, as appropriate, in this FDR/FEIS (refer to **Appendix H**).

The public will be given one additional opportunity to review and comment on this FDR/FEIS prior to publication of the Record of Decision.

Project Stakeholder Group – A 36-person project stakeholder group was formed in 2007. The group consists of federal, state, and local governmental agencies; business, community, and environmental groups and organizations; local land and business owners; educational institutions; historical societies; and area residents. Members of the stakeholder group were tasked with the following responsibilities:

- Be a “sounding board” for the project team to determine how concepts may be received by the public;
- Bring ideas and viewpoints of their constituency to the discussion; and
- Strive to build consensus.

A list of stakeholder group members is provided in **Appendix G**. The group met multiple times during the scoping process, including during the preparation of this FDR/FEIS, and was invited to all public information meetings.

Other Stakeholder Outreach – The NYSDOT has coordinated with various stakeholders to present project information and to solicit input. Continued outreach will involve meetings with federal, state, and local agencies, elected officials, as well as business and community groups.

Project Website – A project website (www.dot.ny.gov/scajaquadacorridor) was established at the initiation of the scoping process to provide information about the project. The website facilitates the exchange of information regarding the project and contains presentations, graphics, meeting summaries, and other project information. The site also functions as an ongoing means for the public to submit questions and to request being added to the project mailing list. The site has been updated to include announcements of project meetings and to allow access to documents (e.g., DDR/DEIS, FDR/FEIS), which will continue to be posted as they became available.

Mailing List – A mailing list of contacts, including elected officials, public agency contacts, interested parties, and individuals was developed. It will continue to be used to issue press releases, meeting notices, and other communications with the public.

Newsletters and Press Releases – Project newsletters and press releases were periodically produced and distributed to keep the public informed on project progress and events. Newsletters contained simple, non-technical descriptions and graphical illustrations. They were mailed and posted on the project website. Newsletters and project meeting announcements were also translated into the Spanish language (see below).

Limited English Proficiency – As discussed in **Section 4.2.3.3**, Census data indicate that there are areas of Hispanic / Latino populations in neighborhoods surrounding NYS Route 198. The Hispanic / Latino population makes up over 20 percent of 5 Census Block Groups, which exceeds the percent of the general population in both Erie County (4.5%) and the City of Buffalo (10.5%). For compliance with EO 13166, "Improving Access to Services for Persons with Limited English Proficiency," and New York State Executive Order 26, "Statewide Language Access Policy," many meeting notices were translated into Spanish and published in local newspapers as well as those in general circulation. Opportunities have been available to have materials translated into other languages. "I Speak Cards" and interpretive services were made available at formal public meetings and the public hearing.

1.7.3 Coordination with Cooperating and Participating Agencies

Cooperating and Participating Agencies are responsible for identifying, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval.

The following agencies were invited to serve as Cooperating and/or Participating Agencies on this project:

- **Cooperating Agencies:**
  - U.S. Army Corps of Engineers (USACE)
  - U.S. Environmental Protection Agency (USEPA)
  - U.S. Department of the Interior, National Park Service (NPS)
  - U.S. Department of the Interior, Fish and Wildlife Service (USFWS)
  - NYS Department of Environmental Conservation (NYSDEC)
  - NYS Office of Parks, Recreation and Historic Preservation (OPRHP) – State Parks
  - OPRHP - State Historic Preservation Office (SHPO)
  - NYS Department of State (NYSDOS)
- **Participating Agencies:**
  - City of Buffalo
  - Greater Buffalo-Niagara Regional Transportation Council
  - Niagara Frontier Transportation Authority
  - New York State Thruway Authority
  - Erie County
  - Erie County Soil and Water Conservation District

The FHWA and NYSDOT have collaborated with the Cooperating and Participating Agencies during the preparation of the DDR/DEIS, the FDR/FEIS, and assessment of effects, including monthly conference calls with the Cooperating Agencies. All agencies will be notified of the availability of this FDR/FEIS and given appropriate opportunities to comment. Following the Record of Decision, the NYSDOT will coordinate with the appropriate agencies to complete any necessary permit(s) for the project.

1.7.4 Contact Information

For further information about the Scajaquada Corridor Project, please visit the project website (www.dot.ny.gov/scajaquadacorridor) or contact:

Craig S. Mozrall, P.E.
Regional Special Projects Manager
New York State Department of Transportation
100 Seneca Street
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Please use the six-digit Project Identification Number (PIN) 5470.22 when submitting comments.

TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT / FINAL 4(f) EVALUATION

CHAPTER 2
PROJECT CONTEXT: HISTORY, TRANSPORTATION PLANS, CONDITIONS AND NEEDS

November 2017

PIN 5470.22
NYS Route 198 (Scajaquada Expressway) Corridor
Grant Street Interchange to Parkside Avenue Intersection
City of Buffalo
Erie County

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

ANDREW M. CUOMO
Governor

CATHY CALHOUN
Acting Commissioner

U.S. Department of Transportation
Federal Highway Administration

CHAPTER 2 - PROJECT CONTEXT: HISTORY, TRANSPORTATION PLANS, CONDITIONS AND NEEDS

2.1. Project History and Project Limits

2.1.1. Project History

In 1951, the City of Buffalo Planning Commission adopted a *Major Traffic Ways Plan* that included the Scajaquada Expressway as one component of a system of expressways intended to alleviate heavy traffic volumes on residential streets. This plan built upon the 1946 New York State *Report on the New York State Thruway and Arterial Routes in the Buffalo Urban Area.* The City Planning Commission's 1951 *Planning Progress Report* promoted "channelization of traffic onto limited access expressways."

The Scajaquada Expressway was constructed in the 1950s and 1960s through the historic Delaware Park. This park was developed between 1868 and 1898 and is considered by the Buffalo Olmsted Parks Conservancy (BOPC) to be the centerpiece of the series of parks and boulevards in Buffalo designed by Frederick Law Olmsted.

Park facilities and features are located on either side of the Scajaquada Expressway. The Buffalo Zoological Gardens, Delaware Park Golf Course, Mirror Lake, and the Buffalo and Erie County Historical Society are located on the north side of the expressway, while Marcy Casino, Hoyt Lake, and the Albright-Knox Art Gallery are located to the south. When Delaware Park was constructed, Delaware Avenue was the only major city street crossing through the park. Delaware Avenue was kept at a lower grade than the surrounding parkland to reduce the perception of intrusion.

In the late 1980s, the Delaware Park Steering Committee began to search for ways to better integrate the roadway with its surroundings. In June 1999, the City of Buffalo and the BOPC, in cooperation with the NYSDOT and Greater Buffalo-Niagara Regional Transportation Council (GBNRTC), initiated a study to identify alternative solutions that would address transportation and safety needs while enhancing the compatibility of the roadway with the unique characteristics of Delaware Park. The limits of that study were from the Grant Street interchange to the Parkside Avenue intersection. A public participation program, including the involvement of a Project Advisory Group, guided the development of a *Final Report and Expanded Project Proposal* (EPP), which was published in June 2005. That document recommended further study and refinement of alternatives to transform the existing highway into an urban arterial (non-expressway) transportation facility.

A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the New York State (NYS) Route 198 (Scajaquada Expressway) Corridor Project (hereafter, "the Scajaquada Corridor Project" or "the Project") was published in the Federal Register on October 29, 2007. At that time, the limits of the project were defined as being from the Interstate 190 (I-190) interchange to the NYS Route 33 interchange. Coordinating and Participating Agencies were identified and invited to an Agency Scoping Meeting held on November 13, 2007. A formal Public Scoping Meeting was held on November 28, 2007. In the following years, through the public outreach process for the project, numerous ideas have been developed and discussed and the NYSDOT has received a large amount of public and stakeholder input for consideration.

On May 31, 2015, in response to a fatal accident, the Governor of New York State directed the Commissioner of the NYSDOT to reduce the posted speed limit along NYS Route 198 to 30 miles per hour, while the NYSDOT continued to investigate long-term changes. The posted speed limit was 50 miles per hour prior to that date.

A *Project Scoping Document* was completed in May 2016. A *Draft Design Report and Environmental Impact Statement* (DDR/DEIS) was published in November 2016. Both documents are available on the project website (www.dot.ny.gov/scajaquadacorridor).

As a result of the scoping process, several potential alternatives, including converting NYS Route 198 into a modern expressway, reducing NYS Route 198 to one travel lane in each direction, and eliminating the roadway between Elmwood Avenue and Parkside Avenue, were dismissed from further consideration. Based on the project purpose, objectives, needs, and public input, a Build Alternative, which would transform NYS Route 198 from an urban expressway into an urban boulevard, was developed for study in the DDR/DEIS and this *Final Design Report and Environmental Impact Statement* (FDR/FEIS). The Build and No Build Alternatives are described in **Chapter 3**.

2.1.2. Project Limits

The project limits for the Scajaquada Corridor Project are the Grant Street interchange and the Parkside Avenue intersection (including necessary approach work).These termini consist of intersecting roadways that are major points of traffic generation. The project limits were selected based on the types of surrounding land uses and roadway characteristics along and within the corridor and in consideration of the project purpose and objectives (see **Section 1.2**).

The characteristics of NYS Route 198 differ throughout the corridor. The portion of NYS Route 198 between the Grant Street interchange and the Parkside Avenue intersection is mainly at-grade and is surrounded by cultural and recreational resources, most notably, Delaware Park. Designed by Frederick Law Olmsted, Delaware Park retains the pastoral character of Olmsted's original design, defined by its gently rolling terrain, clusters of trees, and broad lake within a diverse landscape of winding paths, groves and open spaces. In addition to its modern recreational and cultural facilities, Delaware Park provides the city's residents with the "aesthetic amenities" articulated by Olmsted's design for Buffalo's parks and parkways. The surrounding land uses, including the Parkside East and West areas historically associated with the park, generate substantial pedestrian and bicycle trips along and within the vicinity of the corridor. The portion of NYS Route 198 between the Grant Street interchange and I-190 is primarily surrounded by industrial uses, with some emerging residential uses, and includes an elevated viaduct. The portion of NYS Route 198 between the Parkside Avenue intersection and NYS Route 33 is primarily surrounded by residential and institutional uses and includes a depressed section through rock cut.

As presented in this FDR/FEIS, the analyses conducted for the Project have enabled a balanced consideration of the need for safe and efficient transportation; of the social, economic, and environmental impacts of the proposed transportation improvement; and of national, state, and local environmental protection goals. As stated in **Section 1.4.2**, the study areas for the project analyses were developed based on appropriate protocols under the National Environmental Policy Act (NEPA) and related laws, regulations and NYSDOT procedures, and varied depending on the particular topic. The study area for topics related to changes in traffic, such as noise, air quality and energy, includes areas that have a potential to experience change as a result of traffic diversion.

Thus, based on the above considerations, the Grant Street interchange and Parkside Avenue intersection are rational end points for the Project (logical termini) and provide a project area of sufficient length to address environmental matters on a broad scope. Note that the project limits were initially identified in the NOI as I-190 and NYS Route 33; however, these limits were refined during the scoping process based on the above considerations and were identified as the Grant Street interchange and the Parkside Avenue intersection in the scoping document.

The Scajaquada Corridor Project is independent of other transportation projects or activities in the area. The Project has independent utility; serves a discrete purpose (see **Section 1.2.2.1**); connects logical termini; and would not restrict the consideration of alternatives for other reasonably foreseeable transportation improvements. While the Project is completely independent, it is recognized that other projects within the vicinity are being pursued at this time and/or may be pursued to achieve other purposes. These other projects are not connected to, nor are they dependent on, the Scajaquada Corridor Project. They do not satisfy the purpose of the Scajaquada Corridor Project or the realization of its stated objectives. They can proceed prior to, concurrently with, or subsequent to the completion of the Scajaquada Corridor Project. Conversely, the Scajaquada Corridor Project does not influence, restrict, or dictate the consideration of any of the other projects in the vicinity.

2.2. Transportation Plans and Land Use

2.2.1. Local Plans for the Project Area

The Metropolitan Planning Organization (MPO) for Erie and Niagara Counties is the GBNRTC. The GBNRTC is focused on establishing a comprehensive, coordinated, and continuing transportation planning process for the metropolitan area, including development of the 2035 Long-Range Transportation Plan. This plan serves as a guide for meeting the area's multimodal transportation system needs, including development of the Transportation Improvement Program (TIP). The TIP is the complementary capital programming component of the Long-Range Transportation Plan consisting of all federally funded roadways, transit, and major transportation projects being considered within the region over the next five years. The completed metropolitan planning process allows for the allocation of millions of dollars in federal funding annually to improve all modes of travel as identified in the TIP or Long-Range Transportation Plan. This includes public transit, pedestrian usage, and bicycling as well as vehicular travel in Niagara and Erie Counties. The current 2035 Long-Range Transportation Plan is an update to the 2030 Long-Range Transportation Plan and reaffirms the previous (2030) plan. While the plan itself is unchanged, the 2035 Long-Range Transportation Plan update includes reassessment of many key plan elements, including goals and objectives, financial resources, transportation plan projects, 2035 demographics, resource agency consultation, congestion management, on-going long range planning activities, and continuous public involvement opportunities. The 2035 Long-Range Transportation Plan was officially endorsed by the GBNRTC on May 17, 2010.

As the state-designated MPO, the GBNRTC's planning process must be consistent with federal transportation law. Legislation known as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users outlined eight planning factors, which are specific areas that need to be considered for all metropolitan planning activities. The planning factors include:

- Economic vitality of the area;
- Transportation system;
- Safety and security;
- Mobility improvements;
- Environmental protection and enhancement;
- Enhanced connectivity;
- Efficient system management; and
- Preservation of the existing transportation system.

The current legislation, known as the Fixing America's Surface Transportation (FAST) Act, will be used in the next update to the GBNRTC's Long-Range Transportation Plan.

The current Long-Range Transportation Plan was developed with input from many stakeholder groups, including representatives from public agencies, such as the NYSDOT and the Niagara Frontier Transportation Authority (NFTA), community based organizations, environmental agencies, business groups, local municipalities, and private citizens. The stakeholder input combined with other planning activities by regional, state, and binational agencies have helped to create a Long-Range Transportation Plan with a greater focus on projects and investment plans to achieve the mutually supported plan objectives. The current 2017-2021 TIP represents a regional consensus on which priority transportation projects are essential to the Buffalo-Niagara region during the next five years. Projects included in the program help move the region toward implementing the Long-Range Transportation Plan, meet short range needs, and provide for the maintenance of the existing transportation system.

The NYS Route 198 (Scajaquada Corridor) Project, Phase I, PIN 5470.22 is recognized on the current TIP. Phase II will be incorporated in a subsequent TIP amendment.

In 2010, The New York State Smart Growth Public Infrastructure Policy Act took effect as an amendment to the state's Environmental Conservation Law. The Act is intended to minimize the unnecessary cost of sprawl development and requires state infrastructure agencies, including the NYSDOT, to ensure public infrastructure projects undergo a consistency evaluation.

In 2011, Governor Cuomo signed New York's Complete Streets Act requiring state, county, and local agencies to consider the convenience and mobility of all users when developing transportation projects that receive state and federal funding. The initiative presents an opportunity to expand upon historic programs and collaborate with bicyclists, pedestrians, individuals with disabilities, and others to identify best practices and designs for transportation facilities.

2.2.1.1. Local Comprehensive Plans ("Master Plan")

This project is consistent with local planning initiatives, including the City of Buffalo's Comprehensive Master Plan titled *The Queen City in the 21st Century: The Buffalo Comprehensive Plan*, which established a dual commitment to "fix the basics" and "build on assets." Among the goals of the plan are the restoration and enhancement of the City's natural, cultural, and built heritage. Key priorities include maintaining the quality of public infrastructure on a timely basis as well as the restoration and expansion of Frederick Law Olmsted's "extraordinary system of parks and parkways," including Delaware Park, "that give Buffalo its unique shape and character."

Improving access to the region's lakes, rivers, and creeks while enhancing water quality, waterfront lands, and habitats is also among the initiatives stated in the City of Buffalo's Comprehensive Master Plan. This initiative is furthered by the *Local Waterfront Revitalization Program* (LWRP). That document is currently in draft format. The purpose of the LWRP is to "develop a comprehensive plan and vision" for the city's waterfront areas. Scajaquada Creek is within the LWRP boundary.

The City of Buffalo has also adopted a "Complete Streets" policy to guide infrastructure development. The purpose is to encourage projects focusing on the safety and mobility of all users, including motorists, transit users, pedestrians, bicyclists, and individuals with disabilities. Another goal of the program is to reduce the region's carbon footprint by providing modal alternatives to the automobile-centered infrastructure. To accomplish these goals, the City of Buffalo is developing a complete system of bikeways, pedestrian facilities, shared use paths, bicycle parking facilities, and safe crossings. Whenever possible, bicycle and pedestrian facilities are to be included in all new construction, reconstruction, and maintenance projects throughout the City of Buffalo in accordance with United States Department of Transportation (USDOT) and NYSDOT guidelines.

The *Buffalo Bicycle Master Plan Update* articulates the City's vision to become a world-class bicycling community. Bicyclist needs are to be integrated into the City's projects, policies, and programs and the planning, implementation, and maintenance of roadway, public works, and transit projects are to include improvements to accommodate bicyclists of all abilities. The goal is to improve safety, the environment, public health, and quality of life for all. The City of Buffalo *Bicycle Master Plan Update* includes several facilities that are adjacent to and cross NYS Route 198.

2.2.1.2. Local Private Development Plans

In December 2010, the Richardson Center Corporation completed a Draft Generic Environmental Impact Statement for redevelopment of the Richardson-Olmsted Complex, which includes the Buffalo Psychiatric Center. The complex sits south of the project area between Forest Avenue, Rockwell Road, Rees Street, and Elmwood Avenue. State funding was obtained to revitalize this area in the hopes of spurring tourism and showcasing the architecturally diverse nature of the surrounding area. The plan calls for landscape enhancements in keeping with the Olmsted style and a development scenario involving a hotel and conference center, community visitor's center, single family housing, luxury housing, and parking. The first phase of the redevelopment project will occupy one-third of the existing buildings while remaining buildings are stabilized pending future opportunities. The Hotel Henry Urban Resort and Buffalo Architecture Center opened in March 2017. For additional information, refer to: http://www.richardson-olmsted.com/.

In the fall of 2010, Buffalo State College completed a facilities master plan that provides direction for future campus growth and change for the period from 2013 through 2023. The purpose of the plan is to target capital investments to advance the strategic academic mission of Buffalo State College by renewing campus facilities, enhancing the campus experience, and engaging the communities around the campus. The plan includes the construction of a stadium with two levels of parking, residence hall upgrades, and a two- to four-level parking garage along the side of campus facing the Scajaquada Corridor. Additional parking and a campus operation building would also be built across Grant Street. More information is available at: http://facilities.buffalostate.edu/facilities-master-plan.

The State University Construction Fund is planning a project called "Reconstruct Iroquois Drive" on the campus of Buffalo State College. The project would provide for full depth replacement of approximately 4,000 feet of roadway, replacement of the stormwater drainage system, retaining wall reconstruction, roadway lighting, signing, and marking.

The Buffalo Olmsted Parks Conservancy, NYS Department of Environmental Conservation, U.S. Army Corps of Engineers, and Forest Lawn Cemetery organizations have several projects focused on revitalizing Scajaquada Creek in various stages of planning, funding approval, or implementation. These include creek access and path improvements, stream bed improvements, water quality testing, and visual assessment.

In early 2015, the City of Buffalo Planning Board approved a $25 million development known as "100 on Forest." The development at 100 Forest Avenue will consist of nine multi-family residential (suite) buildings and a clubhouse targeting Buffalo State College, Canisius College, and D'Youville College students. It will include 592 beds in 176 units with 492 parking spaces. Plans call for multiple recreational amenities to be included. Completion is targeted for the summer of 2017.

According to publicly available information published in the *Buffalo News*, a housing project called "Campus Walk One" would be situated on 3.6 acres at 643 Grant Street and surrounding properties. It would be designed to serve housing needs for Buffalo State College students. Eighty three- and four-bedroom apartments would accommodate approximately 300 students. Phase one would include approximately 40 apartments with 149 beds and four retail shops facing Grant Street. The complete development would also eventually include up to 5,000 square feet of amenities, and 5,500 square feet of retail space. Up to 60 parking spaces would be constructed in the center of the block.

The Albright Knox Art Gallery has announced a project to expand and refurbish its building and grounds. The project, known as AK360, will be the Albright Knox's first expansion in more than one-half century. The project is estimated at $80 million and will add facilities for special exhibitions, gallery space, and space for educational, dining, and social activities. Studies of parking needs, supply, and potential locations are also planned.

There are ongoing efforts to clean up Scajaquada Creek and establish wetlands within the Forest Lawn Cemetery *grounds in conjunction with the Buffalo Riverkeeper and City of Buffalo Sewer Authority.*

The projects described above can proceed prior to, concurrently with, or subsequent to the completion of the Scajaquada Corridor Project. These projects would not dictate the design configuration of the Scajaquada Corridor Project. Conversely, the Scajaquada Corridor Project would not influence, restrict, or dictate the consideration of any of the above listed projects. Should these projects occur after the Scajaquada Corridor Project is built, they would not require substantial modifications or changes to the as-built project. Coordination and outreach with Buffalo State College and the Albright Knox Art Gallery are underway given their proximity to the Scajaquada Corridor. Collaboration will continue throughout project development.

There are no other planned or approved developments within the project area that would impact traffic operations along the NYS Route 198 corridor.

2.2.2. Transportation Corridor

2.2.2.1. Importance of the Project Route Segment

NYS Route 198 is of local and regional importance. It provides direct motor vehicle connectivity between I-190 and NYS Route 33. It also connects residential areas and businesses along the corridor to Buffalo's regional transportation network. It is used by City of Buffalo residents for short distance vehicular travel within and between the City's northern neighborhoods and provides indirect access to numerous commercial, educational, and historic destinations for residents and visitors via interchanges and the Parkside Avenue intersection.

NYS Route 198 is a Qualifying Highway on the National Network of roadways designated by the Surface Transportation Assistance Act (STAA) of 1982. Qualifying Highways accommodate large trucks, including tractor trailer combinations with trailers up to 53 feet long. These "special dimension" vehicles are allowed to travel a maximum of one mile from a Qualifying Highway to complete deliveries. Per NYSDOT Policy on Large Truck Freight Movement, large trucks should utilize the National Network for all travel except to access terminals or to reach food, fuel, rest, or repair locations. NYS Route 198 is also a part of the National Highway System, which is a network of approximately 160,000 miles of roadways important to the nation's economy, defense, and mobility.

2.2.2.2. Alternate Routes

Together, NYS Route 198 and NYS Route 33 provide a direct connection between I-190 just north of downtown Buffalo and I-90 (the New York State Thruway) near the Buffalo Niagara International Airport. The closest alternate expressway route is four miles to the north using I-290 from I-190 to I-90. The closest expressway alternate to the south is 3.5 miles away and involves using I-190 from downtown Buffalo to I-90. Each route is a suitable detour for long distance (regional) travel, including travel by heavy trucks.

Locally, the Scajaquada Expressway sits within a network of city streets. The closest parallel streets to the north are Amherst Street and Hertel Avenue. These are Urban Minor Arterials generally with one through travel lane in each direction and on-street parking. There are exclusive turn lanes at major intersections. Amherst Street and Hertel Avenue pass through commercial and residential areas and are viable alternate routes for local trips. Refer to **Section 2.3.1.5 (3)** for discussion of travel times along alternate routes for local trips.

To the south, the closest parallel route to NYS Route 198 involves Forest Avenue and Delavan Avenue. Forest Avenue and Delavan Avenue are Urban Minor Arterials with one to two through travel lanes in each direction and some on-street parking. These roadways also pass through a mix of commercial and residential areas. Delavan Avenue passes by the southern edge of Forest Lawn Cemetery. This route is a

viable alternate for local trips. Refer to **Section 2.3.1.5 (3)** for discussion of travel times along alternate routes for local trips.

2.2.2.3. Corridor Deficiencies and Needs

NYS Route 198, as it currently exists, is paved with wide shoulders, interchanges, and limited pedestrian connectivity between either side of the park. It includes ramps, grade separations, overhead sign structures, median barrier, and other features typical of a freeway, which results in the current roadway configuration being incompatible with the surrounding community. The expressway is at odds with its rich cultural and recreational surroundings, acting as a physical barrier between the two sides of Delaware Park and adjacent land uses.

The expressway is not compatible with the park and adjacent land uses and geometric and operational deficiencies have been identified throughout the project limits. The needs for the project are detailed below.

- ***Context and Connectivity –*** Public discussion over the last 15 years regarding the effect of the controlled-access expressway on the function and context of Delaware Park have led to a decision by the NYSDOT that modifications are needed to the highway facility to better address the competing interests.

  Land uses adjacent to the expressway include recreational, residential, and commercial. Notable features within the corridor include Scajaquada Creek, the Buffalo History Museum, the Japanese Garden, the site of the 1901 Pan-Am Exposition, the Buffalo Zoological Garden, Delaware Park, Buffalo State College, the Albright-Knox Art Gallery, the Marcy Casino, Hoyt Lake, Forest Lawn Cemetery, and Medaille College. The Jesse Kregal Pathway, a shared-use path running along the north side of NYS Route 198 from Niagara Street to Delaware Avenue, is located on the north side of the Scajaquada Creek and Hoyt Lake. The Jesse Kregal Pathway connects Riverside to Parkside Avenue through Delaware Park.

  The existing controlled-access expressway bisects the park, separating access to many of the previously-mentioned facilities. Only limited opportunities (one overpass near Lincoln Parkway and sidewalks and bicycle lanes along Delaware Avenue) exist for bicyclists and pedestrians to cross the expressway to access either side. The surrounding land uses generate substantial pedestrian and bicycle trips along and within the vicinity of the corridor. In the one-mile section between Elmwood Avenue and Delaware Avenue, there is only one pedestrian crossing, however; that existing crossing does not meet current accessibility standards (grades and railings on the pedestrian bridge). In the one-mile section between Delaware Avenue and Parkside Avenue, there are no pedestrian crossings. The only connections between the western and eastern sections of the park are five-foot-wide sidewalks on the Delaware Avenue overpass. Based on the origins and destinations previously noted, the current level of bicycle- and pedestrian-accessible accommodations is inadequate based on existing demand. There is a need to provide additional pedestrian and bicycle crossings and connections that are compatible with the context of the corridor.

- ***Operations and Geometry –*** NYS Route 198 is presently classified as an Urban Principal Arterial Expressway. A mismatch of physical features and driver expectation has resulted in historically higher than statewide-average accident rates along the corridor. There is a need to match driver expectation of the corridor with its design and function to enhance the safety and travel experience of all users; therefore, the functionality of the facility needs to be modified.

  The geometry of NYS Route 198 within the project limits has been reviewed against the NYSDOT's minimum standards for making capital improvements. There are non-standard features for 11 different criteria along mainline NYS Route 198 and 9 different criteria along its ramps. Refer to **Section 2.3.3.2** for additional detail on existing non-standard features.

Radar speed studies undertaken between August 2015 and April 2016 (Refer to **Section 2.3.1.5**) show that on average, traffic on NYS Route 198 operated at speeds between 38 and 46 miles per hour, which is in excess of the 30 mile per hour posted speed limit, even with elevated levels of enforcement. The speed studies also showed that approximately 80% of vehicles were moving at speeds in the range of 30 and 40 miles per hour between Elmwood Avenue and Parkside Avenue. Traffic calming measures are needed to reduce travel speeds along the corridor.

Prior to May 31, 2015, acceleration and deceleration lane lengths along NYS Route 198 were considered non-standard for a modern expressway. In the summer of 2015, in an effort to calm traffic and better operationally support the lowered posted speed limit, the NYSDOT removed the acceleration and deceleration lanes between Grant Street and Parkside Avenue, converting these intersections to stop sign-controlled entrances. The existing geometry of the entrance ramps is not optimal for a stop signed-controlled configuration. Modifications to the geometry of these entrance ramps would improve the sight lines for traffic entering the roadway and reduce the frequency of accidents.

Non-standard features, non-conforming features, incompatible speeds, and relatively high vehicular traffic volumes have historically resulted in points of peak hour traffic congestion and higher than statewide-average accident rates along the expressway. Traffic congestion continues to occur in the corridor at the Delaware Avenue interchange and Parkside Avenue intersection during peak periods. Prior to 2015, more than one-half of all mainline, weaving, ramp junction, and intersection areas along the expressway had accident rates higher than those experienced at similar facilities statewide. The expressway had six identified High Accident Locations within the project limits. Approximately one-third of all collisions resulted in at least one personal injury. A limited set of accident data is available for the period from June 2015 to October 2015. The safety performance of NYS Route 198 subsequent to the reduction in the posted speed limit from 50 miles per hour to 30 miles per hour was reviewed (Refer to **Section 2.3.1.8 (2)** for details). Rear end accidents have now begun to occur at the new stop sign-controlled entrances to NYS Route 198 matching the patterns at the Delaware Avenue interchange's stop sign-controlled entrance points. The overall frequency of accidents within the project limits has decreased.

- ***Infrastructure –*** The existing closed drainage system is failing. The system includes misaligned pipes and deteriorated inlets that are difficult to maintain, leading to plugging by debris and isolated flood events. Untreated stormwater can also be released into Scajaquada Creek. The pavement consists of an asphalt overlay on a concrete base. The pavement requires a 10 to 15-year cycle of milling and resurfacing to stay in good condition. Horizontal clearance to light poles along the corridor is inadequate. As a result, poles have been knocked down, raising both safety and maintenance concerns.

Transportation System Management (TSM) and Transportation Demand Management (TDM) improvements were implemented along the project corridor around 2010. There are closed circuit television cameras present along the project corridor. Images from these cameras are available to the traveling public through the New York State 511 website at http://511ny.org. In addition, there is a dynamic message sign (DMS) along westbound NYS Route 198 between Grant Street and Niagara Street that provides users of the corridor with important travel and other information. Lastly, the Niagara International Transportation Technology Coalition (NITTEC) provides traveler information, images from traffic cameras, and text from overhead message signs to the public in real time via their website at http://nittec.org/. While these services provide helpful information, they have not eliminated localized traffic congestion or accidents along the Scajaquada Corridor.

NYSDOT Highway Emergency Local Patrol (HELP) vehicles operate on NYS Route 198; however, assistance from the HELP can be complicated by minimal sight distance in several locations. A lack of shoulder in some sections also prevents the patrol from pushing a disabled vehicle out of a travel lane.

In summary, there is a need to:

- Improve the compatibility of the roadway with its surroundings;
- Maintain the critical transportation link between I-190 and NYS Route 33;
- Maintain local connectivity for all modes of travel;
- Correct geometric features that do not meet current design standards;
- Reduce the disparity between vehicular operating speeds, the posted speed limit, and the design speed;
- Address historically higher than statewide average accident rates, accident severity, and identifiable accident patterns; and
- Rehabilitate or replace the pavement, drainage system, and lighting.

2.2.2.4. Transportation Plans

This project is on the approved Transportation Improvement Program (TIP) under Project Identification Number (PIN) 5470.22.

This project is not part of an approved Congestion Management System (CMS) or Interim Congestion Management System. A Major Investment Study (MIS) was not performed.

Installation of Intelligent Transportation Systems (ITS) support infrastructure is complete within the project corridor. Refer to **Section 2.3.1.4** for additional discussion. At this time, there are no plans for the implementation of additional TSM or TDM improvements within the project corridor to reduce congestion or improve overall operating conditions.

Given the importance of NYS Route 198 to the regional and local transportation networks, work zone traffic control for this project and for any adjacent projects that may use this corridor as a detour would require coordination. No projects have been identified that would use the NYS Route 198 corridor as a detour at this time.

2.2.2.5. Abutting Highway Segments and Future Plans for Abutting Highway Segments

The Scajaquada Corridor Project extends from the Grant Street interchange to the Parkside Avenue intersection. There are two abutting segments.

NYS Route 198 from I-190 to the Grant Street Interchange – This segment of NYS Route 198 begins on an elevated viaduct. Pavement markings were changed and rumble strips added as interim traffic calming measures in May 2015. There are two 11-foot-wide travel lanes in each direction separated by a four-foot-wide curbed, concrete median with corrugated beam median barrier. There is concrete barrier (jersey shape) along each outside shoulder. The riding surface of the concrete deck is in good condition based on field observation. The posted speed limit is 30 miles per hour. The median barrier has been painted brown.

Beyond the viaduct there is 26 feet of asphalt pavement in each direction divided by a four-foot curbed median. The median has a concrete surface and a corrugated median barrier. There are two 11-foot-wide travel lanes in each direction and shoulder widths vary. The asphalt riding surface is in good condition, having been resurfaced in May 2016. The posted speed limit is 30 miles per hour. The terrain is level.

Together these two pieces of NYS Route 198 are known as the “Western Transition Zone”. There are no plans to widen this highway segment within the next 20 years; however, permanent traffic calming features, including, but not necessarily limited to, color, textures, lighting, signing, and removal of the

median barrier from the viaduct, are under consideration for implementation by the NYSDOT as a separate, independent future action.

NYS Route 198 from Parkside Avenue to NYS Route 33 (The Kensington Expressway) – This segment of NYS Route 198 has three 11-foot-wide travel lanes in each direction. The roadway is curbed and depressed below NYS Route 5 (Main Street) and Kensington Avenue. The median curb offset varies between one and two feet. The curbed median is generally 10 feet wide but narrows to 5.5 feet near the NYS Route 33 (Kensington Expressway) interchange. The median surface is paved with asphalt. Corrugated beam guide railing runs along both sides of the median and is painted brown. A chain link fence exists in the median from NYS Route 5 (Main Street) to the NYS Route 33 (Kensington Expressway) interchange to prevent pedestrian crossing. The snow storage area between the roadway and adjacent stone retaining walls is paved with a gray colored concrete with brick patterning. Remaining snow storage areas adjacent to the Humboldt Parkway are paved with standard concrete. The asphalt riding surface is in good condition, having been resurfaced in May 2016. The posted speed limit is 30 miles per hour.

Pavement markings and signs were modified within this segment in 2016 as interim traffic calming measures. There are no plans to reconstruct or widen this highway segment within the next 20 years; however, the removal of an overhead sign, replacement of the chain link fence, stone wall repairs, and possible ramp reconfigurations at NYS Route 33 are currently under consideration by the NYSDOT. Improvements may be constructed in this "Eastern Transition Zone" under a separate, independent future action.

2.2.2.6. Intersecting Roadways

Grant Street - Grant Street passes over NYS Route 198 at the western end of the project. It is connected to the Scajaquada Expressway by a full interchange. The interchange has a partial cloverleaf design. Adjacent to the interchange, Grant Street has two through travel lanes in each direction and auxiliary turn lanes. The pavement width varies and parking is prohibited. The asphalt pavement surface is in good to fair condition based on field observation.

- South of the interchange and adjacent to the campus of Buffalo State College, Grant Street has one 11-foot-wide through travel lane in each direction, a 10-foot-wide center lane used for left turns at intersections, and no on-street parking. Beyond Rockwell Road, Grant Street has one 10-foot-wide travel lane and an eight-foot-wide parking lane in each direction. The asphalt pavement surface is in good to fair condition based on field observation. The alignment is straight and the profile is level.

- North of Amherst Street, Grant Street has one 10-foot-wide through lane and an eight-foot-wide parking lane in each direction. The profile is level and the alignment is straight.

Grant Street is owned and maintained by the City of Buffalo. There are no plans at this time to widen the street adjacent to NYS Route 198 within the next 20 years.

Elmwood Avenue - Elmwood Avenue passes over NYS Route 198 to the west of Hoyt Lake. It is connected to the Scajaquada Expressway by a full interchange. Adjacent to the interchange, Elmwood Avenue has two through travel lanes in each direction. There is a northbound left turn lane and a southbound right turn lane at the westbound on-ramp to NYS Route 198 (Ramp EC, refer to the ramp designation key, **Exhibit 2.2.2.6** in **Appendix A1**). Parking is prohibited in this area. The asphalt pavement surface is in good condition based on field observations.

- South of Rockwell Road, Elmwood Avenue is 40 feet wide and divided into two directions by a yellow full barrier stripe. There are two 10-foot-wide travel lanes in each direction. Part-time on-street parking is allowed in the northbound curb lane. The alignment is straight and the profile is level. The pavement was rehabilitated in 2013 and is in good condition.

- North of Nottingham Terrace, Elmwood Avenue is 50 feet wide and has two through travel lanes in each direction. Inside lanes are 12 feet wide and curb lanes are 14 feet wide. Parking is prohibited. The vertical profile is level, the alignment is straight, and the pavement condition is good to fair based upon field observation.

- The NYSDOT began replacing the Elmwood Avenue Bridge over NYS Route 198 (BIN 1039959) and Scajaquada Creek under NYSDOT PIN 5470.30 in 2015. The new bridge now carries two 10-foot-wide travel lanes in each direction, has four-foot shoulders, an 8.5-foot-wide sidewalk on the east side, and a 14-foot-wide barrier-separated shared-use path on the west side. The new bridge also features aesthetic treatments, ornamental lighting, and pedestals for the installation of public art. Substantial completion occurred in late 2016 and final completion is expected in 2017.

Elmwood Avenue is owned and maintained by the City of Buffalo. There are no plans to widen the segment of Elmwood Avenue north of the Scajaquada Expressway within the next 20 years.

Lincoln Parkway - Lincoln Parkway was severed by the original construction of NYS Route 198. The street is connected to both the eastbound and westbound roadways, but there is no break in the median to permit cross access. There is a one lane, one-way entrance ramp connecting Lincoln Parkway and Nottingham Terrace to westbound NYS Route 198 (Ramp LI). There is also a one-way entrance ramp from Lincoln Parkway to eastbound NYS Route 198 (Ramp LJ).

- North of Nottingham Terrace, Lincoln Parkway has two 25-foot-wide roadways, northbound and southbound, with one lane in each direction. They are separated by a 20-foot-wide grass median. Parking is permitted in either direction. The vertical profile is level and the horizontal alignment is generally straight beginning 300 feet north of Nottingham Terrace. The asphalt pavement surface is in good condition based on field observations.

- South of Iroquois Drive, Lincoln Parkway is 48 feet wide with one through travel lane in each direction. Parking is restricted during specific time periods. The vertical profile ascends gently to the south. The alignment is generally straight beginning 1,200 feet south of NYS Route 198. The asphalt pavement surface is in good condition based on field observations.

Lincoln Parkway is owned and maintained by the City of Buffalo. There are no plans at this time to widen either segment of Lincoln Parkway adjacent to NYS Route 198 within the next 20 years.

Delaware Avenue (NYS Route 384) - Delaware Avenue passes under NYS Route 198. It was originally constructed at a lower elevation to prevent visual intrusion into Delaware Park. There is a full interchange connecting the two highways; however, the westbound ramps (Ramps DE and DF) connect directly to Nottingham Terrace.

- The minimum clear zone is approximately 10 feet in the vicinity of the interchange. Street lights are generally located behind the sidewalk from just south of the Nottingham Terrace intersection to south of the NYS Route 198 ramps.

- Immediately south of the interchange, Delaware Avenue consists of two 11-foot-wide through travel lanes and a five-foot-wide bicycle lane in each direction separated by a raised grass median that varies between 35 feet and 65 feet wide. The asphalt pavement surface condition is good based on field observation. Parking is prohibited. The vertical profile is level and the alignment is serpentine.

- South of Forest Avenue, Delaware Avenue transitions to a 60-foot-wide roadway with two through travel lanes in each direction. The travel lanes are 12 feet wide and the remaining space is allocated to a southbound parking lane. The horizontal alignment is straight and the profile is generally level. The asphalt pavement surface is in good condition based on field observation.

- Between the Scajaquada Expressway and Nottingham Terrace, there are three 11-foot-wide travel lanes in each direction. The outermost lane functions as an auxiliary lane near the NYS Route 198 ramps. A grass median and five-foot-wide bicycle lanes are also present. An exclusive northbound left turn lane is included at the Nottingham Terrace intersection. The alignment is curvilinear and the profile rises toward Nottingham Terrace. The asphalt pavement surface is in good condition based on field observations.
- North of Nottingham Terrace, Delaware Avenue transitions to a 60-foot-wide roadway with two 11-foot-wide travel lanes in each direction separated by a 14-foot-wide center two-way left turn lane. Parking is prohibited. The vertical profile is level and the alignment is straight. The asphalt pavement surface is in fair condition based upon field observations.

The City of Buffalo owns and maintains Delaware Avenue. The city's statutory speed limit of 30 miles per hour applies within the project limits, however a recent reconstruction project in 1997 utilized a design speed of 45 miles per hour. There are no plans at this time to widen the roadway adjacent to NYS Route 198 within the next 20 years.

Parkside Avenue - Parkside Avenue meets NYS Route 198 at a four-way, at-grade, signalized intersection. The south leg of the intersection provides access to Medaille College. The entire intersection is situated within the footprint of Agassiz Circle. There is a raised concrete median extending 200 feet to the north from the stop line at NYS Route 198. This feature prevents traffic on Agassiz Circle or the opposing driveway to Delaware Park from turning left within the intersection approach.

- Immediately north of NYS Route 198, Parkside Avenue has two 10-foot-wide travel lanes in each direction. Parking is prohibited along the roadside. The vertical profile is level and the alignment is generally straight. Parkside Avenue's asphalt pavement surface condition is fair based upon field observation.
- In 2016 he City of Buffalo completed traffic calming improvements to reduce the number of vehicular travel lanes on Parkside Avenue, north of NYS Route 198. Parkside Avenue now has one northbound lane for vehicular traffic between NYS Route 198 and Florence Avenue There is a single lane in each direction between Florence Avenue and Amherst Street with a center two-way left-turn lane and on-street parking along the eastern curb.
- South of NYS Route 198, Parkside Avenue has one travel lane in each direction and a northbound left turn lane. It lies within the footprint of Agassiz Circle and provides access to Medaille College. The asphalt pavement surface condition is fair based upon field observation.

Parkside Avenue is owned and maintained by the City of Buffalo. There are no plans at this time to widen the roadway north of NYS Route 198 within the next 20 years.

2.2.2.7. Other Important Transportation Facilities Within the Project Limits

Another transportation facility is the Jesse Kregal Pathway. This is a shared use path running along the north side of NYS Route 198 from a point west of the project limits (Niagara Street) to Delaware Avenue. The path mostly runs along the north side of Scajaquada Creek and Hoyt Lake. It typically has a 10-foot-wide asphalt surface, although the section from Lincoln Parkway to Delaware Avenue reaches 13 feet wide. The pavement varies in condition from good to poor based on field observations. There are no immediate plans by the City of Buffalo to construct revisions to the pathway.

2.3. Transportation Conditions, Deficiencies and Engineering Considerations

2.3.1. Operations (Traffic and Safety) & Maintenance

2.3.1.1. Functional Classification and National Highway System (NHS)

Classification data for NYS Route 198 within the project limits are summarized in **Exhibit 2.3.1.1-1.** Classification data for intersecting roadways are summarized in **Exhibit 2.3.1.1-2.**

Exhibit 2.3.1.1-1
Classification Data – NYS Route 198

Route	NYS Route 198
Name	Scajaquada Expressway
Functional Classification	Urban Principal Arterial Expressway
National Highway System (NHS)	Yes
Designated Truck Access Route	No
Qualifying Highway	Yes
Within 1 mile of a Qualifying Highway	Yes
Within the 16-foot vertical clearance network	No[1]
Qualified Funding Source	Surface Transportation Program (STP)

Note 1: There is no 16-foot vertical clearance network for the Buffalo area.

Exhibit 2.3.1.1-2
Classification Data – Intersecting Roadways

Route(s)	Functional Classification	NHS	Qualified Funding Source	Qualifying Highway	Designated Truck Access Route
Grant Street	Urban Minor Arterial	No	STP	No	No
Elmwood Avenue (North of NYS Route 198)	Urban Principal Arterial-Other	Yes	STP	No	Yes
Elmwood Avenue (South of NYS Route 198)	Urban Minor Arterial	Yes	STP	No	No
Lincoln Parkway (North of NYS Route 198)	Urban Local Street	No	Non-Federal Aid	No	No
Lincoln Parkway (South of NYS Route 198)	Urban Major Collector	No	STP	No	No
Delaware Avenue (NY 384) (North of NYS Route 198)	Urban Principal Arterial-Other	Yes	STP	No	Yes
Delaware Avenue (NY 384) (South of NYS Route 198)	Urban Principal Arterial-Other	Yes	STP	No	No
Parkside Avenue	Urban Minor Arterial	No	STP	No	No

Note: NHS = National Highway System

NYS Route 198 is a Qualifying Highway. All facilities listed in **Exhibit 2.3.1.1-2** are therefore within one mile of a Qualifying Highway.

2.3.1.2. Control of Access

Existing highway boundaries along NYS Route 198 are classified as “with access.” This means that driveways can be connected to the roadway with a permit from the NYSDOT. Vehicular access to the Scajaquada Expressway within the project limits is restricted to the following locations:

- Grant Street Interchange
- Elmwood Avenue Interchange
- Lincoln Parkway Partial Interchange
- Delaware Avenue (NYS Route 384) Interchange
- Parkside Avenue Intersection

There are two facilities with direct driveway access to NYS Route 198. One driveway serves a police radio tower located in Delaware Park, east of Delaware Avenue. Another facility, the City of Buffalo Maintenance Facility, has two driveway connections to NYS Route 198 eastbound. This building is owned and operated by the City of Buffalo. The Buffalo Olmsted Parks Commission also occupies a portion of the space. The City of Buffalo uses this facility to support ongoing maintenance activities and has no plans for its elimination.

Formal highway boundaries were not established along NYS Route 198 from just west of the Delaware Avenue interchange to the Parkside Avenue intersection at the time of its original construction. The NYSDOT has established an operational right-of-way with a width of approximately 120 feet for the purposes of operating and maintaining NYS Route 198.

2.3.1.3. Traffic Control Devices

There are six traffic signals within the project limits:

- Grant Street at the NYS Route 198 Eastbound Ramps and Buffalo State College Entrance
- Grant Street at the NYS Route 198 Westbound Ramps and Tops Plaza Driveway
- Elmwood Avenue at Iroquois Drive
- Elmwood Avenue at the NYS Route 198 Westbound Ramps and Nottingham Terrace
- Delaware Avenue at Nottingham Terrace
- NYS Route 198 at Parkside Avenue

Traffic signals are owned and maintained by the City of Buffalo with the exception of the light at Parkside Avenue, which is owned and maintained by the NYSDOT. The City of Buffalo signals are semi-actuated and the NYSDOT signal is fully actuated. “Protected” phases when left turns may be made without conflict and “permitted” phases that require left turns to yield to opposing traffic are present. The signal at the intersection of Elmwood Avenue and Iroquois Drive operates using split phases for northbound and southbound traffic. Signals on Grant Street, Elmwood Avenue, and Delaware Avenue are coordinated with others on the same street. The Parkside Avenue signal operates as an isolated intersection. In general, the traffic signal systems are consistent with the *National Manual on Uniform Traffic Control Devices* and the *New York State Supplement* (MUTCD). The NYSDOT conducts signal maintenance on its installations on approximately a two-year cycle. Information on the City of Buffalo’s traffic signal maintenance cycle is not available. Refer to **Exhibit 2.3.1.3-1** in **Appendix C1** for additional information on each signal.

The majority of ground mounted signs within the project limits are in good condition based on field inspection and are generally in conformance with the MUTCD in effect at the time of installation. All ramp entrances to NYS Route 198 are controlled by stop signs with the exception of the westbound entrance from Grant Street.

Overhead guide sign conditions are generally good based on field observation, having been replaced in 2013. Overhead sign structures are of an obsolete aluminum tri-chord design dating back to 1968. NYSDOT research and field inspections have determined that fatigue and cracked welds are a recurring problem in these types of sign structures statewide. Aluminum is also more susceptible to fatigue damage than steel. Revised overhead sign structure design standards using steel truss members are now used for all of New York’s new and replacement structures. Sign inspection reports for the overhead sign structures in the project corridor were reviewed and the results are summarized in **Exhibit 2.3.1.3-2**.

Pavement markings along NYS Route 198 were replaced in 2015 and 2016. Edge lines and lane lines along NYS Route 198 and its ramps are six inches wide. Some segments of shoulder, along with former auxiliary lanes, are delineated with white hatch lines. There are high-visibility “Type LS” crosswalks at the Parkside Avenue intersection, with both ladder bars and transverse lines. Pavement letters (STOP) accompany some stop lines at entrances to NYS Route 198. Milled in audible rumble strips (MIARDS) are also found along NYS Route 198 west of Elmwood Avenue.

Exhibit 2.3.1.3-2
Overhead Sign Structures Summary

SIN	Type	No. of Sign Panels	Minimum Vertical Clearance (ft)	Overall Recommendation	Flag Issued	Flag Description
50700	Span	2	17.45	5 (2011)	No	
50710	Cantilever	1	16.99	5 (2011)	No	
50715	Cantilever	1	17.75	5 (2011)	No	
50720	Cantilever	1	17.59	5 (2011)	No	
50725	Span	2	18.18	5 (2011)	No	
50730	Span	2	16.77	N/A	Yes	Post base has section loss. (flag issued under 2013 interim inspection)
50735	Cantilever	1	17.59	7 (2013)	No	
50740	Cantilever	1	16.99	5 (2011)	No	
50745	Span	3	16.60	N/A	Yes	Post base has heavy corrosion with section loss. (flag issued under 2013 interim inspection)
50750	Span	5	16.90	5 (2011)	Yes	Gap in splice with substandard bolts

Notes:

1. SIN = Sign Identification Number
2. Overall Recommendation refers to the overall condition of the sign structure and its ability to function as a system. The rating references a scale from 1 to 7 with 1 being a totally deteriorated condition and 7 being new. The year in which the recommendation was made is also given.
3. SIN 50705 was removed in 2016.

2.3.1.4. Intelligent Transportation Systems (ITS)

Portable dynamic speed feedback signs and portable changeable message signs are stationed at several locations along both eastbound and westbound NYS Route 198. The purpose of these devices is to reinforce the 30 mile per hour posted speed limit.

Existing ITS elements operating within the corridor include a dynamic message sign (DMS), vehicle detection stations (VDS) using both inductance loops (for continuous counts) and closed circuit television (CCTV) cameras for the monitoring of traffic operations and incidents, and travel time vehicle detection stations (TVDS).

The DMS is located on NYS Route 198 westbound, west of the Grant Street interchange.

Inductance loop VDS are installed at the following locations:

- Eastbound and westbound, west of Grant Street
- Eastbound and westbound, east of Elmwood Avenue
- Eastbound and westbound, east of Delaware Avenue
- Eastbound, west of Parkside Avenue
- Ramp GC

- Ramp GB
- Ramp EF
- Ramp EI
- Ramp EB
- Ramp ED
- Ramp DA
- Ramp DB
- Ramp DC
- Ramp DD
- Ramp DE
- Ramp DF
- Delaware Avenue north of NYS Route 198

Corridor VDS using CCTV cameras are located:

- West of the Grant Street interchange
- In the southeast quadrant of the NYS Route 198 and Grant Street interchange
- Between the Grant Street interchange and Elmwood Avenue interchange
- In the southeast quadrant of the NYS Route 198 and Elmwood Avenue interchange
- Just west of the existing pedestrian bridge and north of NYS Route 198
- In the northeast quadrant of the NYS Route 198 and Delaware Avenue interchange
- In the southwest quadrant of the NYS Route 198 and Parkside Avenue interchange

Images from these cameras are available to the general public online through the New York State Transportation Federation website at http://511ny.org and the Niagara International Transportation Technology Coalition at http://nittec.org/.

Corridor TVDS (E-ZPass tag readers with transmit antennae) are located beneath the Grant Street Bridge and the existing pedestrian bridge, however they are no longer used.

Both wireless and fiber-optic communications are used to interconnect the ITS system. Additional ITS infrastructure within the corridor includes the Scajaquada Expressway Fiber Optic Backbone. This is a duct bank containing four conduits, pullboxes, and 72 fibers along NYS Route 198 from I-190 to NYS Route 33. A total of 96 additional fibers run from Buffalo State College to NYS Route 33. Connections exist to Buffalo State College and the Niagara Frontier Transportation Authority (NFTA) metro rail Humboldt-Hospital station. Installation of the backbone was completed in 2009. The fiber-optic backbone cables carry interagency communication information, CCTV camera images, permanent count station data, and provide for connectivity to DMS units. The communication infrastructure is part of a regional network that supports the Buffalo-Niagara Regional Freeway Management System.

No additional ITS projects are planned within the project limits.

2.3.1.5. Speeds and Delay

2.3.1.5. (1) Posted Speed Limit

The posted speed limit on NYS Route 198 is 30 miles per hour. The City of Buffalo's statutory speed limit is also 30 miles per hour and applies to all adjacent and intersecting streets within the project limits.

Advisory speeds on ramps along the NYS Route 198 corridor are listed in **Exhibit 2.3.1.5 (1)**. Ramps that do not appear in this exhibit do not have a posted advisory speed. A ramp designation key is available in **Appendix A1** as **Exhibit 2.2.2.6**

Exhibit 2.3.1.5 (1) Ramp Advisory Speeds	
Ramp	**Advisory Speed (mph)**
NYS Route 198 Eastbound to Grant Street (Ramp GC)	35
Grant Street to NYS Route 198 Eastbound (Ramp GB)	20
Grant Street to NYS Route 198 Westbound (Ramp GF)	15
NYS Route 198 Westbound to Grant Street (Ramp GE)	30
Elmwood Avenue to NYS Route 198 Westbound (Ramp EB)	25
NYS Route 198 Westbound to Elmwood Avenue Southbound (Ramp ED)	20
Elmwood Avenue Southbound to NYS Route 198 Eastbound (Ramp EF)	10
NYS Route 198 Eastbound to Iroquois Drive and Delaware Avenue (Ramp EI)	20
NYS Route 198 Westbound to Elmwood Avenue Northbound (Ramp EK)	35
Lincoln Parkway to NYS Route 198 Westbound (Ramp LI)	15
NYS Route 198 Eastbound to Delaware Avenue Southbound (Ramp DA)	20
Delaware Avenue Southbound to NYS Route 198 Eastbound (Ramp DB)	20
Delaware Avenue Northbound to NYS Route 198 Eastbound (Ramp DC)	20
Westbound NYS Route 198 to Nottingham Terrace and Delaware Avenue (Ramp DF)	15

Note: 1. mph = miles per hour

2.3.1.5. (2) Spot Speed Studies

Spot speed studies were conducted at six different locations along NYS Route 198 between June 2015 and August 2018. Results were averaged and are tabulated in **Exhibit 2.3.1.5 (2)-1** and reflect actual, measured conditions along NYS Route 198 after the posted speed limit was changed to 30 miles per hour. The 85th percentile speed is that speed at or below which 85% of all vehicles travel. In all cases the 85th percentile speed exceeds the posted speed limit of 30 miles per hour.

Exhibit 2.3.1.5 (2)-1 Spot Speed Studies	
Location	**Average 85th Percentile Operating Speed (mph)**
Eastbound NYS Route 198 between the viaduct and Grant Street	43
Westbound NYS Route 198 between the viaduct and Grant Street	46
Eastbound NYS Route 198 between Grant Street and Elmwood Avenue	40
Westbound NYS Route 198 between the exits to Elmwood Avenue	40
Eastbound NYS Route 198 between Lincoln Parkway and Delaware Avenue	38
Westbound NYS Route 198 between Parkside Avenue and Delaware Avenue	38

Substantial speed enforcement was conducted and tickets issued during the first few months after the change to a 30 mile per hour speed limit. Press releases and media campaigns raised driver awareness of the new speed limit and may have affected the results during that time; however, despite fewer of those activities in the nearer term, operating speeds have remained relatively consistent. Greater detail on the speed studies conducted between June 2015 and October 2016 appear in **Exhibit 2.3.1.5 (2)-2** in **Appendix C2**.

2.3.1.5. (3) Travel Time and Delay Studies

Peak hour travel time studies were conducted on NYS Route 198 between I-190 and NYS Route 33 on three occasions from July 2015 to March 2016. The studies were completed using the floating car method as described in the Institute of Transportation Engineers' (ITE) *Manual of Transportation Engineering Studies* and the results of multiple runs were averaged. As shown in **Exhibit 2.3.1.5 (3)-1**, it currently takes approximately seven minutes to travel the NYS Route 198 corridor during peak traffic periods. Notable sources of delay include the signalized intersection at Parkside Avenue and traffic slowing in the right hand travel lane on NYS Route 198 westbound to exit at Delaware Avenue (Ramp DF).

Exhibit 2.3.1.5 (3)-1 Corridor Peak Hour Travel Times				
NYS Route 198 (I-190 to NYS Route 33)	**AM Travel Time (min:sec)**		**PM Travel Time (min:sec)**	
	Eastbound	**Westbound**	**Eastbound**	**Westbound**
Field Measured (2015-2016)[1]	7:15	6:31	6:57	6:45
Modeled (Vissim) (2016)	7:17	6:53	6:18	6:34
Modeled (Vissim) (2040)	8:04	7:47	6:21	8:25

Notes:
1. Data reflect condition after the change to a 30 mile per hour posted speed limit.

Peak hour travel times were also modeled using Vissim (Version 5.4). Modeled travel times are included in **Exhibit 2.3.1.5 (3)-1**. As shown, the modeled travel times for 2016 are similar to those measured in the field. Travel time estimates in the design year (2040, refer to **Section 2.3.1.6** for additional information on the selection of the design year) were also developed for comparison to future travel time estimates under the Build Alternative (Refer to **Section 3.3.1.5**). The projected increase in the westbound travel time would result from increased queuing at the off-ramp to Delaware Avenue and Nottingham Terrace. Delays are also anticipated grow at Parkside Avenue, increasing the overall time needed to travel the corridor. Refer to **Section 2.3.1.7** for additional information on delay and queuing under existing and no-build conditions.

Peak hour travel time studies were also conducted along representative local alternatives to NYS Route 198. The two most convenient, adjacent parallel alternatives to NYS Route 198 were selected for study as illustrated in **Exhibit 2.3.1.5 (3)-2** in **Appendix C2**. The southern route used Delavan Avenue while the northern route used Amherst Street. Both Delevan Avenue and Amherst Street are two-lane, two-way local streets with signalized and unsignalized intersections, pedestrian crossings, on-street parking, residences, businesses, and a 30 mile per hour speed limit. Both alternate routes are connected with NYS Route 198's western end at the Niagara Street interchange. They are connected with its eastern end at Main Street. Main Street was selected to allow for an equivalent comparison of the northern and southern alternative routes since no northern alternative has a convenient, direct connection to NYS Route 33. Measurements were taken in March 2015 during the peak hours of commuter traffic. Schools and local colleges were in session. The results were averaged and are presented in **Exhibit 2.3.1.5 (3)-3**.

Exhibit 2.3.1.5 (3)-3 Peak Hour Travel Times for Alternative Routes				
Roadway	**AM Travel Time (min:sec)**		**PM Travel Time (min:sec)**	
	Eastbound	**Westbound**	**Eastbound**	**Westbound**
Southern Route (Delavan Avenue)	13:07	13:06	12:17	10:47
Northern Route (Amherst Street)	14:58	16:49	16:33	16:55

A trip along the southern route took roughly 13 minutes in the morning and between 10 and 12 minutes in the evening. A trip along the northern route took between about 15 and 17 minutes during the morning and 16 to 17 minutes in the evening. Therefore, it takes about twice the time to utilize an alternate route as it currently takes to utilize NYS Route 198 between the same points.

2.3.1.6. Traffic Volumes

The following sections summarize the traffic analysis of existing and projected future no-build conditions along the Scajaquada Corridor.

2.3.1.6. (1) Existing Traffic Volumes

Traffic data were collected within the Scajaquada Corridor in March and April of 2016. Mainline NYS Route 198, ramps, and ramp terminal intersections with local streets were included in the coverage area. Data were also collected for local street intersections immediately adjacent to and surrounding the project corridor in preparation for diversion analyses associated with the Build Alternative. A location map showing the diversion area intersections is included in **Appendix A1**, **Exhibit 2.3.1.6 (1)-1**. All public schools and local colleges were in session during data collection. The Elmwood Avenue bridge over NYS Route 198 and Scajaquada Creek was under construction at the time with ramp closures in place; however, adjustments have been made to reflect conditions with no construction or closures.

Continuous 24-hour traffic volume counts were collected and Annual Average Daily Traffic (AADT) volumes were calculated. Existing AADT appear in **Exhibit 2.3.1.6 (1)-2**. They are measured in vehicles per day (vpd). As shown, daily traffic volumes on NYS Route 198 roughly vary from approximately 30,000 to 40,000 vehicles per day depending on location. The volumes are nearly evenly split by direction, although there is slightly more traffic in the eastbound direction at the eastern project limit.

Exhibit 2.3.1.6 (1)-2
Existing Daily Traffic Volumes

NYS Route 198 Segment	Direction	2016 AADT (vpd)
West of Grant Street	Eastbound	17,100 (51%)
	Westbound	16,500 (49%)
	Both Directions	33,600
Grant Street to Elmwood Avenue	Eastbound	15,800 (51%)
	Westbound	15,400 (49%)
	Both Directions	31,200
Lincoln Parkway to Delaware Avenue	Eastbound	19,300 (57%)
	Westbound	14,300 (43%)
	Both Directions	33,600
Delaware Avenue to Parkside Avenue	Eastbound	22,000 (59%)
	Westbound	15,500 (41%)
	Both Directions	37,500

School buses, transit buses, tractor-trailer combinations, and other large vehicles routinely use NYS Route 198. Heavy vehicles are those with dual tires, such as tractor-trailer combinations and buses. The proportion of heavy vehicles in the NYS Route 198 traffic stream varies by direction of travel and time of day; however, based on a review of the data, the following values are considered representative of existing conditions:

- AM Peak Hour Percent of Heavy Vehicles on NYS Route 198: 5%
- PM Peak Hour Percent of Heavy Vehicles on NYS Route 198: 2%
- AM and PM Peak Hour Factor for mainline NYS Route 198: 0.95

Weekday morning and evening peak period intersection counts were conducted from 7:00 to 9:00 AM and 3:45 to 5:45 PM, respectively. All data were recorded in 15-minute increments to allow for identification of one peak hour within each peak commuter period. Passenger cars, trucks, buses, bicycles, and pedestrians were counted. Based upon a review of the turning movement data, the hours of peak commuter traffic were found to occur from 7:30 to 8:30 AM and 4:15 to 5:15 PM.

The counts were adjusted and balanced where appropriate and plotted on traffic flow diagrams. Diagrams showing the existing (2016) morning and evening peak hour turning movement volumes along NYS Route 198 are available in **Appendix C1** as **Exhibits 2.3.1.6 (1)-3 and 2.3.1.6 (1)-4**. Turning movements for intersections within the diversion study area are included on **Exhibit 2.3.1.6 (1)-5** in **Appendix C1**.

2.3.1.6. (2) Future No-Build Design Year Traffic Volume Forecasts

Prior counts taken across the corridor and data from the GBNRTC's fully validated regional travel demand (Trans CAD) model were used along with new counts collected in 2016 to develop background growth rates for the NYS Route 198 corridor and diversion area intersections. The following growth rates were developed and reviewed in April 2016 and subsequently used to forecast changes in future traffic volumes in the absence of a project on NYS Route 198:

- NYS Route 198 and immediately adjacent intersections: 0.25% per year
- Diversion area intersections: 0.15% per year

Planned roadway, intersection, and transit improvements contained in the TIP and capital improvement programs of local governments are considered in the no-build condition. Future land use projections reflect the most current outlook on development, demographics, and employment within the project area, Erie and Niagara Counties, and areas outside those two counties expected to influence traffic flow. The data used for this project are consistent with those used for other regional long range planning efforts.

The growth rates listed above were applied to the 2016 volumes on an annually compounded basis to forecast future year volumes. The estimated time of completion (ETC) for the project is 2020. A design year of 2040 (ETC+20) was selected based upon guidance contained in Appendix 5 of the NYSDOT *Project Development Manual* (PDM). In addition to the ETC+20 volume forecasts, ETC+10 (2030) volumes were developed to support air quality analyses. Future no-build AADT projections for NYS Route 198 are summarized in **Exhibit 2.3.1.6 (2)-1**.

Exhibit 2.3.1.6 (2)-1
Future No-Build Daily Traffic Volumes

NYS Route 198 Segment	Direction	2020 AADT (vpd)	2030 AADT (vpd)	2040 AADT (vpd)
West of Grant Street	Eastbound	17,300	17,700	18,200
	Westbound	16,700	17,100	17,500
	Both Directions	34,000	34,800	35,700
Grant Street to Elmwood Avenue	Eastbound	16,000	16,400	16,800
	Westbound	15,500	15,900	16,300
	Both Directions	31,500	32,300	33,100
Lincoln Parkway to Delaware Avenue	Eastbound	19,500	19,900	20,400
	Westbound	14,400	14,800	15,200
	Both Directions	33,900	34,700	35,600
Delaware Avenue to Parkside Avenue	Eastbound	22,200	22,700	23,300
	Westbound	15,600	16,000	16,400
	Both Directions	37,800	38,700	39,700

Diagrams showing the year 2020, 2030, and 2040 morning and evening peak hour turning movement volumes along NYS Route 198 and at the diversion area intersections under the no-build condition are available in **Appendix C1** as **Exhibits 2.3.1.6 (2)-2** through **2.3.1.6 (2)-10**.

2.3.1.7. Level of Service and Mobility

Level of Service (LOS) is a qualitative measure describing motorist satisfaction with various factors influencing traffic congestion including travel time, speed maneuverability, and delay. The methodology for performing capacity analyses and determining LOS for the vehicular mode of travel is documented in the *Highway Capacity Manual* (HCM) (Transportation Research Board, Washington D.C., 2010). Levels of Service range from A to F. LOS A describes conditions with free-flow operations at expected travel speeds and little or no delay. LOS F denotes highly congested conditions with stop and go traffic, lower than expected speeds, significant congestion, and substantial delays. LOS definitions for signalized and unsignalized intersections are provided in **Appendix C1** as **Exhibit 2.3.1.7**.

LOS for signalized and unsignalized intersections is determined from the average seconds of delay per vehicle (sec/veh). Signalized intersection analyses yield LOS for groups of lanes (those lanes shared by similar movements) on each approach and the intersection as a whole. Unsignalized intersection analyses result in LOS values for critical movements only. Critical movements are those that must yield or stop and give the right-of-way to other approaching vehicles. LOS D or better is generally considered acceptable during peak commuter periods in urban areas such as the City of Buffalo.

NYS Route 198 is a complex system having characteristics of both an urban freeway and arterial roadway. As noted in **Section 2.3.3**, there are interchanges at Grant Street, Elmwood Avenue, and Delaware Avenue. There are also ramps at Lincoln Parkway. All on-ramps are controlled by a stop sign with the exception of the on-ramp from Grant Street to NYS Route 198 westbound. Deceleration lanes, acceleration lanes, and weaving areas were eliminated in 2015 using pavement markings after the posted speed limit was changed to 30 miles per hour. The intersection of NYS Route 198 and Parkside Avenue is controlled by a traffic signal.

Vissim (Version 5.4) was used to model the existing and no-build NYS Route 198 corridor from the Grant Street interchange to the Parkside Avenue intersection. The model was calibrated using queue observations, travel times, and traffic control conditions. Multiple runs were completed for the morning and evening peak hour periods to account for variability within the model. Measures of effectiveness including delay and queuing were extracted from the microsimulation runs and averaged. Delays were converted to LOS based on the *HCM 2010* definitions. Existing traffic signal timing and phasing information used to develop the microsimulations was gathered from multiple sources including NYSDOT records, the City of Buffalo, and field studies. Refinements were made to the Vissim models subsequent to publication of the DDR/DEIS to address comments received from the FHWA and revised results are reflected in this FDR/FEIS.

The existing and no-build modeling, along with a calibration report, is included in Appendix C2.

2.3.1.7. (1) Existing Level of Service and Capacity Analysis

Tabulated results of the LOS and capacity analysis of existing conditions along NYS Route 198 are available in **Appendix C2**, **Exhibit 2.3.1.7 (1)-1**. In general, traffic operations are considered acceptable (LOS D or better) throughout most of the project area. Observed and modeled queues (Refer to **Exhibit 2.3.1.7 (1)-2** and **Exhibit 2.3.1.7 (1)-3** in **Appendix C2**) indicate that in general, blocking of upstream intersections or interchanges does not occur. Corridor locations with a poor level of service or specific queuing issues are summarized briefly below.

- The following stop controlled on-ramps to NYS Route 198 function at LOS E or F during one or both peak hours of traffic. Queuing also regularly occurs at the stop signs as illustrated in **Exhibit 2.3.1.7 (1)-2** and **Exhibit 2.3.1.7 (1)-3**.

  - NYS Route 198 westbound and the Elmwood Avenue on-ramp (LOS F, AM)
  - NYS Route 198 eastbound and the Delaware Avenue southbound on ramp (LOS F AM & PM)

- Backups on NYS Route 198 westbound occur during evening peak hours as a result of the traffic signal at Delaware Avenue and Nottingham Terrace, the close proximity of the end of the NYS Route 198 westbound off-ramp to that signal (less than 75 feet), the stop sign at the end of the ramp, and the relatively short distance between Nottingham Terrace and NYS Route 198 at this location (approximately 340 feet). For example, the average queue during the evening peak hour reaches past the end of the bridge over Delaware Avenue (at or beyond 700 to 800 feet). This condition is a source of delay on NYS Route 198 and also relates to the accident pattern shown on the collision diagrams presented in **Appendix C1**.

- Queuing and congestion occurs at the intersection of NYS Route 198 and Parkside Avenue during the morning peak hour. The intersection operates at LOS D overall with an average delay per vehicle of 48.2 seconds per vehicle, which is just short of becoming LOS E. The eastbound

and westbound approaches function at LOS E and F, respectively during the morning peak. Queuing data suggest that maximum eastbound queues typically extend more than 1,500 feet. Both field observations and the Vissim modeling indicate that maximum queues on Parkside Avenue extend past Robie Street (approximately 600 feet north of NYS Route 198).

- Queuing and congestion also occurs at the intersection of NYS Route 198 and Parkside Avenue during the evening peak hour. The intersection operates at LOS D overall with an average delay per vehicle in excess of 39 seconds per vehicle. The eastbound and westbound left turns function at LOS F. Queuing observations and Vissim modeled queues indicate that maximum westbound queues extend approximately 1,200 feet, ending just west of the Main Street Bridge.

The City of Buffalo's 2005 *Expanded Project Proposal* (EPP) suggested that changes along NYS Route 198 might also have an effect on neighboring local traffic patterns. That document made an effort to quantify the amount of diversion that might occur and measure its effect along the corridor, but did not assess the potential impacts of additional traffic on the surrounding network of local streets, collectors, and arterials. As part of this study, the NYSDOT committed to studying neighboring roadways and intersections that could potentially be affected by a build action on the Scajaquada Corridor.

During the scoping process, the NYSDOT screened 36 intersections across an area likely to be affected by diversion. The area extended from Ferry Street to Hertel Avenue and Niagara Street to Girder Street. Projected traffic volumes (turning movement diagrams), signal timing, phasing, and coordination information, and intersection geometry were analyzed using Synchro to assess the effect of potential alternatives under consideration at that time. Alternative 2 as described in the May 2016 *Scoping Document* was eventually carried into the DDR/DEIS and this FDR/FEIS for further study. Of the 36 intersections studied, 19 were projected to see minimal if any effect from diverted traffic in terms of vehicular volumes and level of service under Alternative 2; therefore, those locations were screened out and the group requiring further study in the DDR/DEIS was reduced to 17. The locations of the 17 remaining intersections are illustrated in **Exhibit 2.3.1.6 (1)-1,** which is located in **Appendix A1**.

Traffic signal timing, phasing, intersection geometry, and volume information were used to complete the diversion area analyses. Capacity analyses for the diversion area intersections were completed using Synchro (Version 8). The purpose of this analysis was to identify intersections that could be negatively impacted by possible changes along NYS Route 198 under the Build Alternative and to assess the reasonableness of mitigation, if necessary. Intersection operations are currently considered acceptable across the diversion area during the morning and evening peak hours with the following exceptions:

- The eastbound lane shared by through movements and right turns currently operates at LOS E at the intersection of Amherst Street and Elmwood Avenue during the evening peak hour. Delays are on the order of just under one minute per vehicle on average.

- Vehicles on Nottingham Terrace's stop controlled approach to Amherst Street experience LOS E during the evening peak hour. Delays are in the range of 40 seconds per vehicle.

- The eastbound right turn lane on Amherst Street at Parkside Avenue currently operates at LOS E during the morning peak hour. Delays approach 60 seconds per vehicle.

- The eastbound lane shared by through movements and right turns at the intersection of Delevan Avenue and Delaware Avenue operates at LOS E during the morning peak hour. The westbound right turn lane operates at LOS E at the same intersection during the evening peak hour. Delays are on the order of 60 to 75 seconds per vehicle, on average.

2.3.1.7. (2) Future No-Build Design Year Level of Service

LOS analyses were completed for future no-build conditions at ETC (2020) and ETC+20 (2040). The results are summarized in **Exhibit 2.3.1.7 (1)-1** in **Appendix C2**. Model-predicted queues (Vissim) for no-build conditions in 2020 and 2040 are presented in **Exhibit 2.3.1.7 (1)-3** in **Appendix C2**. Overall, the no-build LOS analysis results are consistent with the existing findings, except that delays and queues are anticipated to increase slightly over time given the projected growth in traffic.

- Delays and queuing are expected to increase incrementally on all stop controlled ramp entrances to NYS Route 198. LOS E and F conditions are projected to continue throughout the year 2040. Year 2040 projections are summarized below with changes from the existing LOS denoted by an underline. By the year 2040, maximum queues on the ramp from Delaware Avenue southbound to NYS Route 198 eastbound (Ramp DB) are expected to reach the end of the ramp. Average queues on the Elmwood Avenue ramp to NYS Route 198 westbound are also projected to reach the local street.

  - NYS Route 198 eastbound and the Grant Street on-ramp (<u>LOS E PM</u>)
  - NYS Route 198 westbound and the Elmwood Avenue on-ramp (LOS F, AM)
  - NYS Route 198 westbound and the Delaware/Nottingham on-ramp (LOS E, AM)
  - NYS Route 198 eastbound and the Delaware Avenue southbound on ramp (LOS F AM & PM)

- The northbound left turn and southbound right turn from Delaware Avenue to Nottingham Terrace (westbound) are projected to operate at LOS F (over 120 seconds of delay) in the morning peak by the year 2040. This would be caused by congestion both on the adjacent southbound Ramp DE approach to westbound NYS Route 198 and on the short segment of Nottingham Terrace between Ramp DE and Delaware Avenue.

- The westbound and southbound approaches to the intersection of Nottingham Terrace and Ramp LI are projected to operate at LOS F with between 70 and 80 seconds of delay per vehicle during the morning peak by the year 2040. This condition would be caused by backups on Ramp LI, emanating from the stop sign at NYS Route 198.

- Both westbound approach lanes at the intersection of Delaware Avenue and Nottingham Terrace are expected to operate at LOS F with just under 120 seconds of delay per vehicle in the morning peak hour by the year 2040. These delays would also be associated with congestion on the west side of the intersection, near Ramp DE.

- Backups would continue to occur on NYS Route 198 westbound during ~~both the morning and~~ the evening peak hour, starting on the eastbound Nottingham Terrace approach to Delaware Avenue, extending down the NYS Route 198 off-ramp (Ramp DF), and extending on to the mainline. For example, during the evening peak hour, average queues are projected to increase 1.5 times over their value in 2016. This would result in an average queue of over 1,200 feet which would put the back of queue east of the Delaware Park Comfort Station.

- Delays are projected to increase at the Parkside Avenue intersection. In particular, during the evening peak, delays are projected to increase by up to 30% going from LOS D at 39 seconds of delay per vehicle overall to LOS E at 62 seconds per vehicle. One additional lane group during the morning peak and three during the evening peak would operate at LOS E or F in comparison to existing conditions by 2040. Maximum eastbound queues during the morning peak are anticipated to extend nearly 1,800 feet, which would place the back of queue west of the Buffalo Parks Maintenance Facility driveway. Maximum southbound queues on Parkside Avenue in the morning would continue to extend past Robie Street. Average westbound queues on NYS Route 198 during the evening peak would extend nearly 2,000 feet which would place the end of the queue past the Main Street Bridge.

- The eastbound lane shared by through movements and right turns at the intersection of Amherst Street and Elmwood Avenue is projected to continue to function at LOS E during the evening peak hour.

- Vehicles on Nottingham Terrace's stop controlled approach to Amherst Street during the evening peak are projected to see a change from LOS E to LOS F with 92 seconds of delay per vehicle by the year 2020. Delays would increase to 117 seconds per vehicle by the year 2040.

- The eastbound right turn lane on Amherst Street at Parkside Avenue is projected to continue to operate at LOS E during the morning peak hour. Delays would approach 64 seconds per vehicle.

- The eastbound lane shared by through movements and right turns at the intersection of Delevan Avenue and Delaware Avenue is expected to continue to operate at LOS E during the morning peak hour. The westbound right turn lane would operate at LOS F by the year 2040 in the evening peak hour. Delays are projected at 106 seconds per vehicle.

2.3.1.8. Safety Considerations, Accident History and Analysis

An accident analysis was performed in accordance with the NYSDOT *Highway Design Manual* (HDM) Chapter 5, Section 5.3. Two separate studies were completed. New York State Department of Motor Vehicles (NYSDMV) Police Accident Reports (MV104-A) were obtained for a three-year period from October 1, 2011 through September 30, 2014. These reports were used to assess the accident history prior to the posting of a 30 mph speed limit and the installation of interim traffic calming measures along NYS Route 198. Accident reports were also obtained for a twenty-two month period starting on June 1, 2015 and ending on March 31, 2017. These reports were reviewed to determine the impact of the interim traffic control measures. In each case, the accident study limits covered all of NYS Route 198 between the I-190 and NYS Route 33 interchanges. Detailed accident summaries (NYSDOT Form TE-213) for both study periods appear as **Exhibits 2.3.1.8-1** and **2.3.1.8-2** in **Appendix C1**.

2.3.1.8. (1) Accident History Before the Change to 30 mph (2011 to 2014)

Accidents are categorized as fatal, injury, property damage only (PDO) or non-reportable. Non-reportable accidents were not included in the data set. An accident is considered non-reportable if there is no personal injury and either:

a) no motorist report was filed
b) no dollar value of vehicular damage was entered into the report, or
c) the amount of vehicular damage did not exceed $1,000.

A total of 558 accidents were reported within the project limits during the three-year study period from 2011 to 2014. The number of accidents occurring within the corridor and their location is summarized in **Exhibit 2.3.1.8 (1)-1**. A breakdown of accident by severity is included in **Exhibit 2.3.1.8 (1)-2**.

Exhibit 2.3.1.8 (1)-1
Accident Locations

Location	Number	Percent
Mainline NYS Route 198	157	28%
Weaving Section	51	9%
Ramp Junction	42	8%
Mainline Intersection	157	28%
Adjacent (Local Street) Intersection	149	27%
Adjacent (Local Street) Segment	2	<1%
Total	**558**	**100%**

Exhibit 2.3.1.8 (1)-2 Accident Severity		
Severity	**Number**	**Percent**
Fatal	0	0%
Injury	236	42%
Property Damage Only (PDO)	322	58%
Total	**558**	**100%**

As shown, just over 40% of the accidents occurring within the project limits resulted in at least one personal injury. There were no fatalities along NYS Route 198 during the study period. A fatal accident did occur in the spring of 2015 when a vehicle left the roadway and struck pedestrians on South Meadow Drive. Neither time of day, time of year, or weather conditions appeared to have a substantial effect on the accident history.

A summary of accidents by type is provided in **Exhibit 2.3.1.8 (1)-3**. A collision diagram was also developed to identify clusters and help identify the probable causes of collisions. The collision diagram is **Exhibit 2.3.1.8 (1)-4** and appears in **Appendix C1**. Rear end accidents were the most frequent type to occur along the Scajaquada Corridor. Many of these occurred at the stop controlled ramp entrances and Parkside Avenue intersection. Fixed object collisions came in second, often involving a collision with median barrier or a light pole. The next most frequent type of accident was common in the merge and weave areas and resulted in sideswipes in the same direction.

Exhibit 2.3.1.8 (1)-3 Accident Types		
Accident Type	**Number**	**Percent**
Rear End	262	47%
Sideswipe (Same Direction)	62	11%
Left Turn (Opposite Direction)	45	8%
Right Angle	37	7%
Right Turn (Same Direction)	6	1%
Right Turn (Opposite Direction)	10	2%
Head On	2	< 1%
Sideswipe (Opposite Direction)	1	< 1%
Left Turn (Same Direction)	1	< 1%
Fixed Object	110	20%
Other/Unknown	22	4%
Total	**558**	**100%**

The NYSDOT maintains a database of average accident rates for different types of roadway segments and intersections. Accident rates for linear sections are expressed in terms of the number of accidents per million vehicle miles of travel (acc/mvm). Rates for intersections are expressed in terms of the number of accidents per million entering vehicles (acc/mev). Average accident rates for similar facilities statewide were compared to those calculated for locations throughout the project limits to assess the actual safety performance of the NYS Route 198 corridor versus reasonable expectation.

A summary of accident rates by location along the mainline NYS Route 198 is provided in **Exhibit 2.3.1.8 (1)-5**. The safety performance of the NYS Route 198 mainline segments, prior to the change in speed to 30 mph, indicates higher than average accident rates for 8 of 11 segments between the Grant Street interchange and Parkside Avenue. The performance of exit and entrance ramps (ramp junctures) along this stretch of NYS Route 198 was better than the mainline segments, with two of 10 junctures having accident rates above the statewide average.

Exhibit 2.3.1.8 (1)-5
Mainline NYS Route 198 Accident Rates

Location	Accident Rate (acc/mvm)	Statewide Average (acc/mvm)
Mainline Segments - Eastbound		
Grant Street to Elmwood Avenue	1.64	1.06
From Iroquois Drive exit ramp to Lincoln Parkway entrance ramp	0.56	1.06
Lincoln Parkway to Delaware Avenue	1.64	1.06
From Delaware Avenue southbound entrance ramp, to Delaware Avenue northbound exit ramp	4.05	1.06
Delaware Avenue to Parkside Avenue	0.67	1.06
Mainline Segments - Westbound		
Parkside Avenue to Delaware Avenue	1.95	1.06
Delaware Avenue to Lincoln Parkway	1.22	1.06
From Elmwood Avenue northbound exit ramp, to Elmwood Avenue southbound exit ramp	4.57	1.06
From Elmwood Avenue southbound exit ramp, to Grant Street	0.78	1.06
Weave Segments		
Eastbound from Elmwood Avenue entrance, to Iroquois Drive exit	2.96	1.08
Westbound from Lincoln Parkway entrance, to Elmwood Avenue exit	1.84	1.08
Ramp Junctures		
Location	**Accident Rate (acc/mev)**	**Statewide Average (acc/mev)**
Eastbound NYS Route 198 - Ramp Junctures		
Diverge at Grant Street exit ramp	0.09	0.14
Merge at Grant Street entrance ramp	0.10	0.13
Merge at Lincoln Parkway entrance ramp	0.00	0.13
Diverge at Delaware Avenue southbound exit ramp	0.05	0.14
Diverge at Delaware Avenue southbound exit ramp	0.05	0.14
Westbound NYS Route 198 - Ramp Junctures		
Diverge at Nottingham Terrace exit ramp	0.23	0.14
Diverge at Elmwood Avenue southbound exit ramp	0.10	0.14
Merge at Elmwood Avenue entrance ramp	0.09	0.13
Diverge at Grant Street exit ramp	0.14	0.14
Merge at Grant Street entrance ramp	0.19	0.13

A summary of accident rates at intersections is provided in **Exhibit 2.3.1.8 (1)-6**. Accident rates at the intersections were higher than statewide averages at 11 of 14 locations. The highest intersection accident rates occurred at the two stop controlled Delaware Avenue entrance ramps to NYS Route 198 eastbound. The intersection of NYS Route 198 and Parkside Avenue also exhibited one of the highest rates during this three-year time period (prior to the change in speed to 30 mph).

Exhibit 2.3.1.8 (1)-6
Intersection Accident Rates

Intersection	Accident Rate (acc/mev)	Statewide Average (acc/mev)
Grant Street at NYS Route 198 Eastbound Ramps	0.62	0.23
Grant Street at NYS Route 198 Westbound Ramps	0.28	0.23
Elmwood Avenue at NYS Route 198 West Ramps / Nottingham Terrace	0.31	0.23
Elmwood Avenue at NYS Route 198 West Exit Ramp to Northbound Only	0.55	0.16
Elmwood Avenue at Iroquois Drive	0.70	0.47
Iroquois Drive at NYS Route 198 Eastbound Exit Ramp	0.14	0.16
Iroquois Drive at Lincoln Parkway South	0.16	0.16
Nottingham Terrace at Lincoln Parkway North	0.00	0.26
Nottingham Terrace at NYS Route 198 Westbound Ramps	0.28	0.16
Delaware Avenue at Nottingham Terrace	0.59	0.23
NYS Route 198 East at Delaware Avenue Southbound Entrance Ramp	1.54	0.16
NYS Route 198 West at Nottingham Terrace Entrance Ramp	0.23	0.16
NYS Route 198 East at Delaware Avenue Northbound Entrance Ramp	1.27	0.16
NYS Route 198 at Parkside Avenue	1.07	0.23

The NYSDOT identifies three categories of locations where safety is a concern based on a statistical analysis of accident history. The categories are:

- Priority Investigation Location (PIL) – location where there is a 99.9% level of confidence a problem exists. These locations have high accident rates. Typically, the rate is approximately two and one-half (2.5) to three (3) times greater than the statewide average rate for similar facilities. If the location is a specific intersection fulfilling the above criteria, it is characterized as a Priority Investigation Intersection (PII).

- Safety Deficient Location (SDL) – location where there is a 90.0% level of confidence a problem exists. These locations have high accident rates that exceed the statewide average accident rate. The only definitive difference between a site being characterized as a SDL and PIL is the level of confidence a problem exists.

- High Accident Locations (HAL) – this is a combination of PIL and SDL locations.

NYSDOT Safety Information Management System (SIMS) reports for NYS Route 198 from the Grant Street interchange to the Parkside Avenue intersection in 2013 to 2015 were reviewed. The reports list the Grant Street interchange, Elmwood Avenue interchange, the roadway segment from Lincoln Parkway to Delaware Avenue, and the roadway segment from the Delaware Avenue interchange to the Parkside Avenue intersection as Priority Investigation Locations (PIL). The following were also listed as Safety Deficient Locations (SDL): a 1,000 ft segment east of the Grant Street interchange, the Delaware Avenue interchange and a segment of NYS Route 198 stretching 500 feet to either side of the Parkside Avenue intersection.

2.3.1.8. (2) Accident History After the Change to 30 mph (2015)

Various interim traffic calming measures were put into place to improve overall safety for both drivers and pedestrians after a fatal accident on May 31, 2015. At that time, the speed limit was reduced from 50 miles per hour to 30 miles per hour. New pavement markings were subsequently applied to narrow the travel lanes to 11 feet wide. Auxiliary lanes (acceleration, deceleration, and weaving areas) were eliminated from the Grant Street interchange to the Parkside Avenue intersection. Stop signs were installed at ramp entrances where they did not exist before. Steel-backed timber guiderail was installed along the outside edge of NYS Route 198 within Delaware Park.

Accident Reports were obtained for a twenty-two month period starting on June 1, 2015 and ending on March 31, 2017. Accident patterns were reviewed to qualitatively determine the impact of the interim traffic control measures. A collision diagram for this set of data is included in **Appendix C1** as **Exhibit 2.3.1.8. (2)**. Two hundred and fifteen (215) accidents were reported during the study period. Sixteen (16) were eliminated from the data since they did not occur on the ramps or the corridor. Another eight (8) of the accident reports received were categorized as non-reportable with the amount of vehicular damage indicated as less than $1,000 and no injuries or fatalities. The non-reportable accidents were removed from the data set, leaving 191 accidents in the analysis.

The number of accidents occurring in the June 1, 2015 to March 31, 2017 study period is summarized by type in **Exhibit 2.3.1.8 (2)-1**. A breakdown of accident by severity is shown in **Exhibit 2.3.1.8 (2)-2**.

Exhibit 2.3.1.8 (2)-1
Accident Types After Speed Limit Change

Accident Type	Number	Percent
Rear End	130	68%
Sideswipe (Same Direction)	26	14%
Left Turn (Opposite Direction)	5	3%
Right Angle	4	2%
Right Turn (Same Direction)	1	0.5%
Right Turn (Opposite Direction)	0	0%
Head On	0	0%
Sideswipe (Opposite Direction)	2	1%
Left Turn (Same Direction)	1	0.5%
Fixed Object (pole/tree)	2	1%
Other/Unknown	20	10%
Total	**191**	**100%**

Exhibit 2.3.1.8 (2)-2
Accident Severity After Speed Limit Change

Severity	Number	Percent
Fatal	0	0%
Injury	64	34%
Property Damage Only (PDO)	127	66%
Total	**191**	**100%**

A review of the 2011-2014 accident study results showed that nearly 50% of the total accidents studied were rear end collisions. The more recent study had 130 rear end collisions, which accounts for 68% of the total accidents. Previous accident studies for the NYS Route 198 corridor showed a pattern of rear end collisions occurring at the stop controlled ramps where they met the expressway. As previously stated, stop signs were added at other ramp entrances where they did not exist before in conjunction with the removal of acceleration, deceleration, and weaving lanes. During the June 2015 to March 2017 period, 77 of the 191 accidents (40%) happened at new or existing stop controlled ramp entrances. Many of the accident report descriptions listed the cause as driver inattention, following too closely, and people stopping multiple times at the stop signs as they attempted to pull out onto NYS Route 198.

After rear end collisions, the most frequent accident types in the three years of accident data prior to the speed limit reduction were fixed object collisions (20%) and sideswipes (11%). The twenty-two months of accident data for the period after the speed limit was reduced included only 2 fixed object collisions (1%) and 26 sideswipe accidents (14%). There were no other substantial accident patterns or locations on the Scajaquada Corridor in the study period. Twenty-one of the 191 accidents (11%) were attributed to ice and snow on the roadway and 39 of the accidents (20%) occurred under wet roadway surface conditions. Fifty-five of the accidents (29%) occurred during dark conditions with highway lighting.

None of the 2011-2014 accidents and none that occurred during the June 2015 to March 2016 period resulted in a fatality. However, the previous study found that 42% of the corridor accidents resulted in an injury. That proportion declined slightly after the speed limit reduction, with only 34% reporting one or more injuries. Overall, despite the number of rear end accidents being higher in the more recent study, the accident type and location patterns did not change appreciably and the severity distribution slightly improved with a reduction in injury accidents.

2.3.1.9. Existing Police, Fire Protection and Ambulance Access

The City of Buffalo Police and Fire Departments routinely utilize NYS Route 198 as an emergency response route. The project corridor is covered by both Districts D and E of the City of Buffalo Police Department. District D covers from Main Street westward with their station at 669 Hertel Avenue, three-quarters of a mile north of NYS Route 198. District E, at 2767 Bailey Avenue, covers the area from Main Street eastward with their station two miles east of the Parkside Avenue intersection. New York State Police Troop A is assigned to the area. Their base is on Grand Island.

The City of Buffalo Fire Department has four fire houses within close proximity to the project corridor. The closest, at 1720 Fillmore Avenue and Buehl Avenue, is three-quarters of a mile east of the Parkside Avenue intersection.

Regional ambulance services also utilize the corridor for incident response and to access nearby health care facilities. Rural Metro Ambulance serves the City of Buffalo with their closest office at 481 William L Gaiter Parkway, 1.75 miles east of the Parkside Avenue intersection. Sisters Hospital is located just north of the Scajaquada Expressway on Main Street (NYS Route 5). Millard Fillmore Hospital is located one-mile south of NYS Route 198 on Delaware Avenue at Gates Circle. The Erie County Medical Center (ECMC) is located on Grider Street, east of the project area.

2.3.1.10. Parking Regulations and Parking Related Conditions

Parking and stopping are prohibited on both the mainline roadway and ramps of NYS Route 198.

2.3.1.11. Lighting

There are street lights with breakaway transformer bases along NYS Route 198 throughout the project limits. Poles are located along both sides of the roadway, generally just off the shoulder or outside the curb. Some poles are located behind guide railing, but most are not. Power feeds are underground. Many poles have trussed arms with cobra head style fixtures, though a few davit style poles are also present. Most poles are painted black but a few are painted green. Photoelectric controls are present.

Overall, the lighting system is in fair to poor condition. Many poles show signs of impact damage and rust. Some electric hand hole covers are missing and several poles are out of plumb. Given their proximity to the roadway, light poles along NYS Route 198 are susceptible to being hit and knocked down by errant vehicles. Repairs are typically required each spring. The City of Buffalo owns the light poles, foundations, and conduit system. National Grid owns and maintains the wiring and the luminaires.

2.3.1.12. Ownership and Maintenance Jurisdiction

Agencies primarily responsible for transportation facilities within the project limits include the NYSDOT and City of Buffalo. An existing maintenance jurisdiction table is included as **Exhibit 2.3.1.12**.

Exhibit 2.3.1.12
Existing Maintenance Jurisdiction

Part No.	Highway	Limits	Feature(s) being Maintained	Centerline (mi)	Lane (mi)	Agency	Authority
1	NYS Route 198	Grant Street interchange to Parkside Avenue intersection	Roadway & Bridges	2.2 miles	9.11 miles	NYSDOT	Highway Law Section 349-c & Section 10, Subdivision 25
2	NYS Route 198 Ramps			1.72 miles	1.86 miles		
6	Grant Street	--	Roadway & Bridge	--	--	City of Buffalo / NYSDOT (Bridge)	Highway Law Section 349-c & Section 10, Subdivision 25
7	Elmwood Avenue	--	Roadway & Bridge	--	--	City of Buffalo / NYSDOT (Bridge)	Highway Law Section 349-c & Section 10, Subdivision 25
8	Lincoln Parkway	--	Roadway	--	--	City of Buffalo	Highway Law Section 349-c
9	Delaware Avenue	--	Roadway	--	--	City of Buffalo	Highway Law Section 349-c
10	Parkside Avenue	--	Roadway	--	--	City of Buffalo	Highway Law Section 349-c
11	South Meadow Drive	--	Roadway	--	--	City of Buffalo	Highway Law Section 349-c
12	Jesse Kregal Pathway	_	Shared-Use Path	--	--	City of Buffalo	--

2.3.2. Multimodal

2.3.2.1. Pedestrians

There are numerous pedestrian generators in the project area, including, but not limited to, Buffalo State College, the Albright-Knox Art Gallery, the Buffalo History Museum, Delaware Park, Forest Lawn Cemetery, and Medaille College. A Capital Projects Complete Streets Checklist (**Exhibit 2.3.2.1**) is included in **Appendix C1**. Section 1229 of New York State Vehicle and Traffic Law and a June 1, 1963 Traffic Commission Order prohibit pedestrians, animals and non-motorized vehicles on expressways and interstate highways within the state. There are no sidewalks along the roadway.

Pedestrians are accommodated within the project limits by the Jesse Kregal Pathway, a shared-use path running along the north side of NYS Route 198 from a point west of the project limits (Niagara Street) to Delaware Avenue. The path mostly runs along the north side of Scajaquada Creek and Hoyt Lake. It typically has a 10-foot-wide asphalt surface, although the section from Lincoln Parkway to Delaware Avenue reaches 13 feet wide. The pavement varies in condition from good to poor based on field observations. Slope failures have occurred near the Church of the Assumption where the path lies above the banks of Scajaquada Creek, compromising the structural integrity of the adjacent railing in some cases.

The Jesse Kregal Pathway will be connected to a new shared-use path being constructed over the Elmwood Avenue Bridge as part of the NYSDOT's bridge replacement project. It is already connected to South Meadow Drive via a sidewalk over Delaware Avenue and a short path extension. Pedestrians are also accommodated on the shared-use path portion of South Meadow Drive, which is typically closed to traffic between Delaware Avenue and Parkside Avenue. There is another footpath located along the north side of South Meadow Drive. The Jesse Kregal Pathway, along with these other facilities, is part of a network of existing pedestrian and bicycle facilities that stretch throughout Delaware Park.

Sidewalks and curb ramps exist on the intersecting and adjacent city streets. Detectable warning fields are missing from curb ramps except at those locations where ramps have been recently installed or replaced.

A pedestrian bridge crosses over NYS Route 198 just east of Lincoln Parkway. Pedestrians, bicyclists, and inline skaters utilize the crossing on a regular basis. The structure does not meet current Americans with Disabilities Act (ADA) regulations because it includes grades in excess of 4.5% without a landing for every 30-inches of vertical rise. The ramp on the south end of the bridge has a 14.6-foot vertical rise (7% slope), the ramp at the north end of the bridge has a 17.5-foot vertical rise (7% slope), and the main span has a 4-foot vertical rise (5.21% slope). The structure lacks a handrail, the guard height at the north end is 3/4-inch below the 42-inch requirement, and the guard openings are 5 inches (1-inch greater than the standard). A Non-Standard Feature Justification for Pedestrian Facilities would need to be completed and approved by the appropriate authority if these features are to remain.

Other opportunities to cross NYS Route 198 exist at Grant Street (over the expressway using sidewalk on the bridge), Elmwood Avenue (over the expressway using sidewalk and a shared use path on the bridge), and Delaware Avenue (under the expressway using sidewalk along the roadside). There are high visibility, at-grade crosswalks on all four legs of the Parkside Avenue intersection.

There are stairs on two corners of the NYS Route 198 bridge over Delaware Avenue that connect to sidewalk below. The northwest corner is also connected to Nottingham Terrace by a sidewalk running along the NYS Route 198 westbound off-ramp to Nottingham Terrace.

2.3.2.2. Bicyclists

There are numerous bicycle traffic generators in the project area, including those mentioned in **Section 2.3.2.1** and the adjacent neighborhoods. The City of Buffalo published a *Bicycle Master Plan Update* in January 2016. The City's vision is to "make Buffalo a world-class bicycling community." Bicyclist needs are to be integrated into City projects, policies, and programs. Planning, implementation, and maintenance of roadway, public works, and transit projects are to include improvements that accommodate bicyclists of all abilities. The *Buffalo Bicycle Network Map* identifies several roadways adjacent to and crossing NYS Route 198 for use by bicyclists. A copy of that map is provided in **Appendix C1** as **Exhibit 2.3.2.2**. The map also includes the Jesse Kregal Pathway. No facilities or accommodation are shown on NYS Route 198 itself. Section 1229 of New York State Vehicle and Traffic Law and a June 1, 1963 Traffic Commission Order prohibit non-motorized vehicles, including bicycles, from using expressways and interstate highways within the state; therefore, bicycles cannot legally travel on NYS Route 198.

Bicyclists who share the roadway with vehicular traffic are accommodated on adjacent and intersecting city streets. There are marked bicycle lanes on Delaware Avenue within the project limits. The *Buffalo Bicycle Master Plan Update* suggests that bicyclists comfortable riding with traffic make up 5% or less of the general population.

The Jesse Kregal Pathway, South Meadow Drive, and the existing network of shared-use paths within Delaware Park currently accommodate bicyclists who prefer to ride separately from motor vehicles. There is also a two-way cycle track extending south from NYS Route 198 along Elmwood Avenue. That facility is connected to the Jesse Kregal Pathway via a shared-use path over the Elmwood Avenue Bridge.

2.3.2.3. Transit

The Niagara Frontier Transportation Authority (NFTA) provides bus service within and around the project area. Buses utilize NYS Route 198 and all streets abutting NYS Route 198 with the exception of Lincoln Parkway. **Exhibit 2.3.2.3** illustrates local NFTA bus routes and is available in **Appendix C1**.

An express bus route utilizes the Scajaquada Expressway between I-190 and Elmwood Avenue, connecting the City of Buffalo's central business district and the Town of Tonawanda. A dedicated route known as the Medaille Circulator travels between Medaille College and the Buffalo Zoological Gardens using Parkside Avenue. The Buffalo State, Elmwood, and Grant Circulator routes each cross NYS Route 198 via Grant Street. NFTA also provides service to selected portions of nearby local streets as a public school busing service on weekdays.

There is a park-ride lot (LaSalle Station) in the City of Buffalo on Main Street near Hertel Avenue. It functions as a staging location for car pools as well as a transfer point between automobile travel and light rail service.

2.3.2.4. Airports, Railroad Stations, and Ports

There are no airports within the project limits. The Greater Buffalo Niagara International Airport is located approximately six miles east of the project area on NYS Route 33.

There is a light rail line beneath Main Street and the Scajaquada Expressway approximately ¼ mile east of the project limits. This line connects Downtown Buffalo with the University at Buffalo's south campus. Light rail stations near the project area include Amherst, Humboldt-Hospital (Main Street and Kensington Avenue intersection), and Canisius College-Delavan.

There are no ports or port entrances within the project limits. The Port of Buffalo is located approximately four miles south of the project area off I-190.

2.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, State Lands)

The project area includes a portion of Delaware Park. The park complex includes a lodge, golf course, ball fields, tennis courts, shared-use paths, and foot paths. Direct vehicular access to the park is not available from NYS Route 198. Vehicular access is available via Parkside Avenue and Nottingham Terrace. The police radio tower driveway, though designated for official use only, is occasionally utilized by park visitors.

Forest Lawn Cemetery is located immediately south of NYS Route 198. There is no direct access to the cemetery from NYS Route 198. Public access is available from Delaware Avenue at its intersection with Delevan Avenue and from Main Street.

Access to the Jesse Kregal Pathway (refer to **Sections 2.3.2.1** and **2.3.2.2**) is available at several locations, including Grant Street, Elmwood Avenue, Lincoln Parkway, and Nottingham Terrace. There is a connection between this path and South Meadow Drive.

Scajaquada Creek and Hoyt Lake are located alongside NYS Route 198 between Grant Street and Delaware Avenue. Access to the creek is available from the Jesse Kregal Pathway. Hoyt Lake can be accessed from a system of walkways surrounding the shore with connections to the Scajaquada Pathway, Lincoln Parkway, and Delaware Avenue.

There are no state-owned recreational lands near the project area.

2.3.3. Infrastructure

2.3.3.1. Existing Highway Section

Existing features along NYS Route 198 appear (along with proposed features) on the typical sections, plans, and profiles contained in **Appendix A2**. The following sections summarize the existing highway section between the Grant Street interchange and Parkside Avenue intersection.

2.3.3.1. (1) Grant Street Interchange to Lincoln Parkway

- NYS Route 198 has one roadway in each direction divided by a four-foot-wide curbed median. The median is curbed and paved.
- Median curb offsets are striped at one foot. There are two 11-foot-wide travel lanes in each direction.
- There is a variable width deceleration lane in the eastbound direction on approach to Ramp GC.
- There is a 12-foot-wide acceleration lane in the westbound direction where Ramp GF joins mainline NYS Route 198.
- The following former auxiliary lanes were eliminated using white hatching in 2015:
    1. Acceleration lane, Ramp GB at eastbound NYS Route 198
    2. Acceleration lane, Ramp EB at westbound NYS Route 198
    3. Weaving lane, Ramp EF to Ramp EI along eastbound NYS Route 198
    4. Weaving lane, Ramp LI to Ramp EK, along westbound NYS Route 198
    5. Acceleration lane, Ramp LJ at eastbound NYS Route 198
- Right shoulder widths vary and are separated from the travel lanes by a five-foot-wide (and varies) hatched area.
- The minimum radius in this segment is 820 feet and the maximum grade is 2.7%.
- Ramps at Grant Street and Elmwood Avenue are one lane wide with shoulders, except as follows:
    1. Grant Street Ramp GC is two lanes wide with curbing along one edge.
    2. Elmwood Avenue Ramp EC is a two-lane, two-way ramp with concrete median barrier and curb.
- Ramps at Lincoln Parkway are one lane wide with stone curb on both sides.

2.3.3.1. (2) Lincoln Parkway to Delaware Avenue

- There is one roadway in each direction divided by a four-foot-wide curbed and paved median.
- Median curb offsets are striped at one foot.
- There are two 11-foot-wide travel lanes in each direction.
- The outside edge of each roadway is curbed. The striped curb offset is three feet wide and varies.
- The minimum radius in this segment is 892 feet and the maximum grade is 1.0%.

2.3.3.1. (3) Delaware Avenue (NYS Route 384) to Parkside Avenue

- There is one roadway in each direction divided by a median. The median is four feet wide, curbed, and paved through the Delaware Avenue interchange. It widens to a 24-foot-wide grass median between the Delaware Avenue interchange and the Parkside Avenue intersection. The median narrows again (four-foot, curbed, paved) on the approach to the Parkside Avenue intersection.
- Median curb offsets are striped at one foot.
- There are two 11-foot-wide travel lanes in each direction up to a point approximately 380 feet west of the Parkside Avenue Intersection. From that point to the Parkside Avenue intersection, there are three 11-foot-wide travel lanes in each direction.
- The outside edge of each roadway is curbed. The striped curb offset is three feet wide and varies.
- The minimum radius in this segment is 1,112 feet and the maximum grade is 3.8%.

- There are three existing driveways within this segment. One serves a police radio tower and two others connect to a park maintenance facility. These driveways are not in conformance with the NYSDOT *Policy and Standards for the Design of Entrances to State Highways*.
- Ramps at Delaware Avenue are one lane wide with stone curb on both sides.

2.3.3.2. Geometric Design Elements Not Meeting Minimum Standards

Existing geometric elements were compared with the minimum standards used by the NYSDOT to make capital infrastructure improvement decisions.

2.3.3.2. (1) Critical Design Elements

In accordance with Chapter 2 of the NYSDOT HDM, critical elements must be compared with the minimum design criteria for capital improvements. Any critical design element that fails to meet the minimum design standards is considered a "non-standard feature" and should be evaluated for remediation and mitigation.

NYS Route 198's mainline geometry was evaluated using a design speed of 50 miles per hour and an Urban Principal Arterial Expressway classification. This is consistent with operating speeds measured after the interim traffic calming measures were installed along the roadway (since late spring 2015) and the existing functional classification of the roadway Non-standard features for mainline NYS Route 198 are summarized in **Exhibit 2.3.3.2 (1)-1**.

A ramp design speed of 25 miles per hour was selected to review critical design elements on the existing ramps. The chosen design speeds are consistent with the current posted speed limit on NYS Route 198 and driver expectation. Non-standard features for ramps within the project limits are summarized in **Exhibit 2.3.3.2 (1)-2.**

2.3.3.2. (2) Other Design Parameters

Other design elements that are not critical design elements but depart from typical design practice are identified as non-conforming features. These features are important because they can have a considerable effect on operational efficiency and safety. Existing non-conforming features along NYS Route 198 are described below.

Intersection Sight Distance:

Intersection sight distance was reviewed per Section 5.9.5.1 of the NYSDOT HDM. The following conditions exist within the NYS Route 198 corridor:

- **Delaware Avenue Ramp DE:** For a 40 mile per hour operating speed, a passenger car requires 385 feet of intersection sight distance to pull into the right lane of traffic on NYS Route 198 westbound from a stopped condition on the ramp. The calculated available sight distance to the left to see approaching traffic in the right lane is 180 feet. To see approaching traffic, a driver must look over the concrete barrier on the Delaware Avenue bridge or pull forward to see around it. To see approaching traffic in the left lane of NYS Route 198, the driver must again look over the concrete barrier or pull forward, but also must look over the median barrier east of the Delaware Avenue bridge (due to the curvature of NYS Route 198). Stopped traffic in the right lane of NYS Route 198 westbound on approach to Ramp DF also interferes with intersection sight distance on Ramp DE resulting in an undesirable situation from a safety perspective.

Exhibit 2.3.3.2 (1)-1
Existing Nonstandard Features – NYS Route 198

Critical Design Element	Current Operating Speed(s)[4]	Standard[1]	Existing Condition	Adverse Accident History? (See Note 2)	Remarks
Lane Width	38 to 46 mph	12 ft	11 ft	No	Lanes narrowed from 12 ft/13 ft in 2015 after the change from a 50 mph posted speed limit to a 30 mph posted speed limit as a traffic calming measure.
Left Shoulder Width	38 to 46 mph	4 ft	1 ft	No	Shoulders were narrowed along with lanes in 2015. Prior to the change from a 50 mph posted speed limit to a 30 mph speed limit in 2015, operating speeds approached 60 mph and 47 accidents resulted in collisions with the median barrier[3] (Grant Street interchange to Parkside Avenue)
Right Shoulder Width	38 to 46 mph	10 ft	Varies 2 ft to 10 ft	No	Shoulders were narrowed along with lanes in 2015. Prior to the change from a 50 mph posted speed limit to a 30 mph speed limit in 2015, operating speeds approached 60 mph and 38 accidents resulted in a roadway departure, guiderail strike, and/or collision with a fixed object[3] (Grant Street interchange to Parkside Avenue)
Bridge Roadway Width	38 to 46 mph	Carries full approach roadway width	< full approach roadway width on viaduct (within 0.3 mi west of Grant Street) and bridge over Scajaquada Creek	No	
Horizontal Curvature	38 to 46 mph	833 ft (minimum)	818 ft in the vicinity of the Elmwood Avenue interchange and Lincoln Parkway	No	The curves near Elmwood Avenue and Lincoln Parkway were the site of 19 accidents that involved loss of control, most associated with poor roadway conditions, prior to the change from a 50 mph posted speed limit to a 30 mph posted speed limit in 2015.[3]

Exhibit 2.3.3.2 (1)-1
Existing Nonstandard Features – NYS Route 198

Critical Design Element	Current Operating Speed(s)[4]	Standard[1]	Existing Condition	Adverse Accident History? (See Note 2)	Remarks
Superelevation	38 to 46 mph	6% (maximum)	5.21% (maximum), see remarks	No	Appropriate superelevation typically not applied as required based on horizontal curve radius. Prior to the change from a 50 mph posted speed limit to a 30 mph posted speed limit, operating speeds approached 60 mph and there were 85 accidents that involved a roadway departure or collision with the median barrier[3].
Stopping Sight Distance	38 to 46 mph	350 ft	308 ft beneath Main Street (within 0.3 mi east of the Parkside Avenue intersection)	Yes	Prior to the change from a 50 mph posted speed limit to a 30 mph posted speed limit, operating speeds approached 60 mph and accidents were attributable to a combination of queuing from the traffic signal at Parkside Avenue and evening peak hour queuing at the NYS Route 33 interchange. The vertical curve does have street lighting.
Horizontal Clearance	38 to 46 mph	15 ft without barrier, 4 ft minimum or shoulder width with barrier	< 15 ft to light poles without barrier, < 4 ft to barriers along substandard left and right shoulders	No	Refer to the remarks for left and right shoulder width.
Vertical Clearance	38 to 46 mph	14 ft (minimum) at vehicular bridges, 15 ft (minimum) at pedestrian bridges and overhead sign structures	14 ft under existing pedestrian bridge	No	
Travel Lane Cross Slope	38 to 46 mph	1.5% to 2%	Varies from 0.5% to 3%, originally constructed with a parabolic crown from Delaware Avenue to Parkside Avenue	No	

Exhibit 2.3.3.2 (1)-1
Existing Nonstandard Features – NYS Route 198

Critical Design Element	Current Operating Speed(s)[4]	Standard[1]	Existing Condition	Adverse Accident History? (See Note 2)	Remarks
Control of Access	38 to 46 mph	Full Access Control	Driveway access at City of Buffalo Police Radio Tower and Parks Maintenance Facility, signalized intersection at Parkside Avenue	Yes, Parkside Avenue	Parkside Avenue intersects NYS Route 198 at a signalized intersection. Rear end and turning accidents have historically occurred at this location. It is currently the only signalized intersection on the Scajaquada Expressway.

Notes:
1. Minimum standards based on NYSDOT HDM Chapter 7, 1954 AASHTO A Policy on Geometric Design of Rural Highways, and NYSDOT HDM Chapter 2.
2. Accident history assessment based on study from June 1, 2015 to March 8, 2016. Refer to **Section 2.3.1.8 (2)** and **Exhibit 2.3.1.8 (2)** in **Appendix C1**.
3. Refer to **Section 2.3.1.8 (1)** and **Exhibit 2.3.1.8 (1)-4** in **Appendix C1**.
4. Design speed of 50 miles per hour (mph) selected for determination of non-standard features based on operating speeds. Refer to **Section 2.3.1.5 (2)** for information on current operating speeds.

Exhibit 2.3.3.2 (1)-2
Existing Nonstandard Features – Ramps

Critical Design Element	Current Operating Speed(s)[1]	Standard[1]	Existing Condition	Adverse Accident History?[2] (Yes/No)	Remarks[3]
Traveled Way Width	25 mph	Width varies based on inside radius of ramp, refer to Exhibit 2-9b of the NYSDOT HDM, provision for passing a stalled vehicle, design traffic condition B.	At least one segment on all ramps except Ramps GB, ED, and DC has a width less than the required standard	No	
Left Shoulder Width	25 mph	3 ft (minimum)	< 3 ft on Ramps EC, EK, LI, LJ, DA, DB, DC, DD, DE, and DF	No	
Right Shoulder Width	25 mph	6 ft (minimum)	< 6 ft on Ramps GC, EC, EK, LE, LJ, DA, DB DC, DD, DE, and DF	No	
Bridge Roadway Width	25 mph	Carries lane and shoulder width	Full lane and shoulder width not carried across bridges on Ramps EC (EB/ED) and EK	No	
Horizontal Curvature	25 mph	144 ft (minimum)	< 144 ft radius on Ramps LI, DE, and DF	No	
Stopping Sight Distance	25 mph	160 ft (minimum)	A 100 ft long sag vertical curve at the end of Ramp DD provides less than 160 ft of stopping sight distance	No	

Exhibit 2.3.3.2 (1)-2
Existing Nonstandard Features – Ramps

Critical Design Element	Current Operating Speed(s)[1]	Standard[1]	Existing Condition	Adverse Accident History?[2] (Yes/No)	Remarks[3]
Horizontal Clearance	25 mph	3 ft (minimum) left, minimum of 6 ft or shoulder width right	< 3 ft to the guiderail on the left side on Ramps GB, GC, and GF; < 6 ft to the guiderail on the right side of Ramps GE, EC, and EK; < 6 ft to light poles on the right side along Ramps LI and LJ, < 3 ft to median barrier on the left side of Ramps DA, and DB < 6 ft to light poles on the right side of Ramps DA and DB; < 3 ft/6ft to light poles on both sides of Ramps DC and DD	No	
Rollover	25 mph	4% between lanes, 8% (maximum) at edge of traveled way	9% at edge of traveled way on Ramps GC and GE.	No	
Control of Access	25 mph	Full Access Control 100 ft from ramp terminals	< 100 ft to driveways at the terminals of Ramps GB, GE	No	.

Notes:

1. Standards based on NYSDOT HDM Chapter 7, and NYSDOT HDM Chapter 2. Design speed based on Exhibit 7-11.
2. Accident history assessment based on study from June 1, 2015 to March 8, 2016. Refer to **Section 2.3.1.8 (2)** and **Exhibit 2.3.1.8 (2)** in **Appendix C1**.
3. Ramp related accidents primarily related to traffic control at ramp terminals or stop-controlled entrances to NYS Route 198 (rear-end accidents)

- **Exit from the Buffalo Parks Facility:** The existing parks building and attached garage, in conjunction with the curvature of NYS Route 198 on approach, obstruct sight lines for vehicles exiting the Buffalo Parks Facility. An employee parking area adjacent to NYS Route 198 worsens the situation. With typical operating speeds of 40 miles per hour, a passenger car exiting the parks building driveway to NYS Route 198 requires 385 feet of sight distance to the left to complete a right turn movement from a stopped condition. A single unit truck requires 500 feet. The field measured sight distance is 450 feet without vehicles parked in front of the building. With vehicles parked in front of the building, the available sight distance is restricted to 295 feet.

Vertical Clearance:

The NYSDOT requires a minimum 10-feet of vertical clearance over shared use paths in accordance with the NYSDOT *Bridge Manual* and 2012 AASHTO *Guide for the Development of Bicycle Facilities*. There is 7.9-feet of vertical clearance over the Jesse Kregal Pathway at Ramp EK and 9.7-feet at Grant Street.

Miscellaneous:

NYS Route 198 was originally constructed as the Scajaquada Expressway. Modern expressways, freeways, and interstates have free flow ramp connections that allow vehicles to enter the mainline at a speed compatible with that of the major roadway. The absence of acceleration and deceleration lanes along with the use of stop signs to control traffic on entry to NYS Route 198 may violate driver expectation and can be considered a non-conforming feature. The angle at which the existing ramps meet NYS Route 198 require a driver to look back over their shoulder which can be an uncomfortable task, especially for older drivers.

2.3.3.3. Pavement and Shoulder

NYS Route 198 was constructed in the late 1950s and early 1960s using a composite pavement section consisting of a 1½ inch asphalt top course and 1½ inches asphalt binder course over an eight-inch thick Portland cement concrete (PCC) foundation. The hot mix asphalt (HMA) was removed to the concrete base and replaced with a two course HMA overlay consisting of two inches of binder and 1½ inches of top in 1981.

Approximately every 10-15 years since, the pavement has undergone regular maintenance consisting of either a resurfacing or milling and resurfacing of the 1½ inch top course. The most recent maintenance project involved milling and paving 1½ inches of the pavement from I-190 to NYS Route 33 (Kensington Expressway) in 2007. In the summer of 2016, the extreme western portion of the project limits was resurfaced with HMA in order to apply new pavement markings associated with traffic calming measures in the "Western Transition Zone**" (**NYS Route 198 from I-190 to the Grant Street Interchange).

According to the NYSDOT March 2016 *Pavement Evaluation Report* (**Appendix D**), the current pavement surface exhibits good rideability and is holding up well since the last maintenance project. It is however, exhibiting some areas of minor distress, including reflective cracking, transverse/longitudinal cracking, and minor rutting, especially at the Parkside Avenue intersection. The existing pavement section strength was reviewed and it was determined that the NYS Route 198 section has sufficient thickness to handle current traffic loads. No shoulder deterioration was discovered in the field survey. A 10-year single course milling and paving cycle with interim crack sealing and surface treatments is needed to maintain the integrity of the existing pavement.

2.3.3.4. Drainage Systems

Stormwater runoff from highway pavements in the NYS Route 198 corridor is either conveyed directly to Scajaquada Creek or collected in closed drainage systems. The existing closed drainage systems consist of drainage inlets and receivers in the median and at the edges of shoulders, connected by series of pipes. The text that follows describes the drainage system in greater detail and is broken down by major drainage segments throughout the corridor.

<u>NYS Route 198 from the elevated viaduct bridge to the NYS Route 198 bridge over Mirror Lake and Hoyt Lake (BIN 1039989), just east of Elmwood Avenue:</u>

The system in this segment consists of drainage structures in the median and on the eastbound shoulder connected by various diameter reinforced concrete pipes (RCP) and discharging to multiple points along Scajaquada Creek. The drainage pipes are of various sizes ranging from 12 inches to 36 inches in diameter. A 36-inch diameter RCP culvert is used to convey the drainage from Grant Street under NYS Route 198 to Scajaquada Creek.

<u>NYS Route 198 from the bridge over Mirror Lake and Hoyt Lake (BIN 1039989) to the pedestrian bridge:</u>

The drainage system in this segment consists of drainage structures on the westbound shoulder, median, and eastbound shoulder. A network of 12-inch RCP culverts drains south, then directly into Hoyt Lake near the entrance ramp to NYS Route 198 from Lincoln Parkway.

<u>NYS Route 198 from the pedestrian bridge to 450 feet east of the pedestrian bridge:</u>

The system in this segment consists of drainage structures on the eastbound shoulder and median. A network of 12-inch RCP culverts drains north, discharging to a 36-inch closed drainage system (off the highway right-of-way). A 36-inch storm sewer comes from Delaware Park and conveys water easterly to Scajaquada Creek.

NYS Route 198 from 450 feet east of the pedestrian bridge to Parkside Avenue:

The system in this section consists of drainage structures along the westbound shoulder, median, and eastbound shoulder. Stormwater in a network of RCP and corrugated metal pipe (CMP) culverts, ranging from 12 inches to 24 inches in diameter, is conveyed toward Delaware Avenue, then directly south to Hoyt Lake via two separate outlets.

NYSDOT conducted a field inspection of the storm drainage system in November 2008 and noted deficiencies in NYS Route 198's existing drainage system. The information was updated in 2016 and indicated that inlets frequently become plugged with surface debris causing ponding during the spring, summer, and fall, along with icy spots in winter. Ponding is more frequent on flatter sections of pavement. Specific drainage concerns are identified below.

NYS Route 198 from 450 feet east of the pedestrian bridge to Parkside Avenue:

Flooding commonly occurs along NYS Route 198 westbound from the Delaware Avenue entrance ramp (Ramp DE) to a point approximately 300 feet west. This flooding sometimes affects both westbound travel lanes. NYSDOT routinely cleans the affected inlets and associated pipes that outlet to Hoyt Lake in response to such an event.

Other concerns include the deterioration of several drainage structures, misaligned pipes, structural and foundation support problems at headwalls, and tree roots that have penetrated select storm sewers resulting in blockages. In addition, there are isolated instances of erosion along the NYS Route 198 westbound shoulder adjacent to Scajaquada Creek.

Preventative maintenance is necessary to minimize the drainage problems along the corridor. Receivers are equipped with only curb inlets and no pavement grates along NYS Route 198 east of Delaware Avenue. The receivers are undersized and known to plug easily with debris, particularly leaves. Leaf removal is routinely completed by NYSDOT in the spring and fall.

Street sweeping is also required on a routine basis in order to mitigate drainage problems. Street sweeping begins in late winter or early spring and continues at three week intervals (at a minimum). It is performed by the City of Buffalo. If the street sweeping is not done on a regular basis, roadway flooding results due to debris in the drainage system. Debris in culverts is also a problem. NYSDOT often has to clean drainage inlets and pipes during flood events. The pipes along the NYS Route 198 corridor commonly become silted again shortly after being cleaned.

Work Zone Traffic Control (WZTC) is required during all maintenance activities on NYS Route 198. The NYSDOT performs WZTC for the majority of the work, including support for city street sweeping operations. Maintenance operations must be scheduled to avoid peak hour lane closures. A lack of shoulders along much of the roadway requires a lane closure for the simplest of drainage maintenance activities. More complicated tasks frequently require closure of the mainline and diversion of traffic to neighboring city streets. Many of the drainage structures along the NYS Route 198 median are interconnected. Cleaning those drainage structures requires a high speed lane closure in both directions concurrently.

Most of the existing drainage system was constructed approximately 50 to 60 years ago and is nearing, if not exceeding, its anticipated service life. If the existing drainage system remains, deterioration would continue and with the passage of time, the NYSDOT would need to increase its maintenance effort in order to keep pace with the deterioration. This would lead to higher annual maintenance costs and eventually a need for complete replacement.

2.3.3.5. Geotechnical

There are no special geotechnical concerns with the soils or rock slopes within the project limits. The NYSDOT completed supplemental soil borings in April 2013 and December 2016. The majority of the soils were sandy with some clay mixed in. Rock was encountered between 7 and 12 feet below the surface between Delaware Avenue and Parkside Avenue.

2.3.3.6. Structure

The following is a list of structures located within the project corridor

(a) BIN 1039910 – Grant Street over NYS Route 198 and Scajaquada Creek
(b) BIN 1039930 – Grant Street (Ramp GF) over Scajaquada Creek
(c) BIN 1039940 – Grant Street (Ramp GE) over Scajaquada Creek
(d) BIN 1039959 – Elmwood Avenue (Ramp EC) over Scajaquada Creek
(e) BIN 1039969 – Elmwood Avenue over NYS Route 198 and Scajaquada Creek
(f) BIN 1039970 – Elmwood Avenue (Ramp EK) over Scajaquada Creek
(g) BIN 1039989 – NYS Route 198 over Scajaquada Creek
(h) BIN 1039990 – Pedestrian Bridge over NYS Route 198
(i) BIN 2260460 – Lincoln Parkway (Ramp LJ) over Scajaquada Creek
(j) BIN 1047259 – NYS Route 198 over Delaware Avenue

2.3.3.6. (1) Description

A review of available as-built drawings, record plans, bridge inspection reports, and load ratings was performed for each of the structures. A cursory visual inspection was also performed at each location to confirm the bridge inspection results and as a supplement to the records review. A table summarizing bridge geometric features, structural characteristics, and current conditions is available as **Exhibit 2.3.3.6 (1)** in **Appendix E**.

2.3.3.6. (2) Clearances (Horizontal/Vertical)

As shown in **Exhibit 2.3.3.6 (1)** of **Appendix E**, the Grant Street bridge over NYS Route 198 has non-standard lane width. The pedestrian bridge over NYS Route 198 does not provide the required 15 feet of vertical clearance. The bridge carrying Ramp EK over Scajaquada Creek does not provide the minimum required 10-foot vertical clearance over the Jesse Kregal Pathway. The NYS Route 198 Bridge over Delaware Avenue (NYS Route 384) does not provide the minimum 14-foot vertical clearance and is posted at 12 feet – 3 inches.

2.3.3.6. (3) History & Deficiencies

Bridges within the project limits have undergone various maintenance treatments, including wearing surface replacements, safety improvements, and other miscellaneous repairs. The maintenance history for each bridge is summarized in **Exhibit 2.3.3.6 (1)** of **Appendix E**.

Within the last 6 months, BIN 1039990 carrying pedestrians over NYS Route 198 was struck and damaged by a vehicle traveling in the westbound direction. The actual vertical clearance under the structure was slightly reduced as a result. The reduced vertical clearance has been posted, but this is considered a temporary condition as the NYSDOT Regional Structures Maintenance Unit plans to make repairs as a separate, independent action that will restore the pre-existing 14-foot vertical clearance.

2.3.3.6. (4) Inspection

Based on the bridge inspection reports, one of the 10 bridges have a NYSDOT Condition Rating less than five. The following bridge has a condition rating less than five and is classified as deficient:

BIN 1039959 – Elmwood Avenue (Ramp EC) over Scajaquada Creek

Based upon the FHWA Sufficiency Ratings, two of the nine vehicular bridges qualify for rehabilitation funding. Structures with an FHWA Sufficiency Rating of 80 or less qualify for funding for rehabilitation. The following bridges have an FHWA Sufficiency Rating of less than 80 to qualify for rehabilitation:

- BIN 1039910 – Grant Street over NYS Route 198 and Scajaquada Creek
- BIN 1047259 – NYS Route 198 over Delaware Avenue

The NYSDOT Conditional Ratings, FHWA Sufficiency Ratings and bridge inspection information are shown in **Exhibit 2.3.3.6 (1)** of **Appendix E**.

2.3.3.6. (5) Restrictions

There are no restrictions posted for bridges along the NYS Route 198 corridor at this time.

2.3.3.6. (6) Future Condition

Continued and proper maintenance of each of the structures within the project corridor would be required to keep them in a safe operational state. This routine maintenance would be conducted as a separate action. Without proper maintenance of the bridges, over time, they will deteriorate, which could eventually lead to load postings and safety problems on some of the structures. The NYSDOT is currently replacing the Elmwood Avenue Bridge over NYS Route 198 under PIN 5470.30. Final completion is expected in 2017.

2.3.3.6. (7) Waterway

Scajaquada Creek is a non-navigable waterway per Federal criteria. A Coast Guard Checklist is not required.

2.3.3.7. Hydraulics of Bridges and Culverts

A preliminary evaluation of bridges over waterways and culverts identified a deficient waterway opening, hydraulic inadequacy, failure vulnerability, or scour susceptibility for BINs 1039930, 1039940, 1039969, 1039970, 1039989, and 2260460.

- BIN 1039969 has a medium hydraulic vulnerability score. It is not on the floods watch or the post flood inspections list and it is considered hydraulically adequate.

- BIN's 1039930, 1039940, 1039970, 1039989, and 2260460 have low chords below the 50-year flood profile as defined by a Federal Emergency Management Agency (FEMA) Flood Insurance Study.

There is one major culvert within the project limits. A culvert is considered major when it has a diameter greater than 36 inches. One 48-inch RCP culvert is located approximately 400 feet west of the Elmwood Avenue overpass and collects stormwater from the NYS Route 198 closed drainage system as well as a drainage ditch located along the eastbound shoulder. The age of the culvert is unknown. It did not exist at the time the expressway was built according to the record drawings and therefore is likely to be less than 50 years old.

2.3.3.8. Guide Railing, Median Barriers and Impact Attenuators

Exhibit 2.3.3.8 summarizes the existence of guide railing, median barriers, and impact attenuators within the NYS Route 198 Corridor.

Exhibit 2.3.3.8
Existing Guide Railing, Median Barriers, and Impact Attenuators

Type	Location/Side	Length (feet)	Condition
Corrugated Beam Median Barrier, Heavy Post Blocked Out	Median, End of Viaduct to Parkside Avenue	11,850	Fair to poor, many repairs, moderate to heavy rusting, some leaning posts and impact damage
Box Beam Guide Rail	I-190 viaduct to Ramp GF, left side	2,034	Mostly good, some fair with light rusting
Box Beam Guide Rail	I-190 viaduct to Grant Street, right side	344	Mostly good, some fair with light rusting
Box Beam Guide Rail	Overhead sign structure and building west of Grant Street, right side	361	Mostly good, some fair with light rusting
Box Beam Guide Rail	Grant Street underpass, right side	213	Mostly good, some fair with light rusting
Concrete Barrier	Overhead sign structure west of Grant Street, left side	62	Good
Box Beam Guide Rail	Between Ramp GE and GF ramp terminals and on Ramp GE bridge, left side	377	Fair with moderate rusting
Sand Barrel Array Impact Attenuator	WB at Ramp GE exit	N/A	Fair to Good
Corrugated Beam Median Barrier	Between Ramps GB and GC at ramp terminal	164	Fair to Good
Corrugated Beam Median Barrier	Between Ramps GE and GF at ramp terminal	98	Fair to Good
Corrugated Beam Guide Rail	Ramp GE, left side	262	Fair to Good
Corrugated Beam Guide Rail	Ramp GF, left side	262	Fair to Good
Box Beam Guide Rail	Ramp GE, right side	328	Fair to Good
Box Beam Guide Rail	From Ramp GE bridge to approx. halfway to Elmwood Avenue, left side	1,017	Fair with moderate rusting
Corrugated Beam Guide Rail	From Ramp EB to approx. halfway to Grant Street, left side	1,050	Mostly fair, some poor with moderate to heavy rusting
Box Beam Guide Rail	Ramps EB and EC, right side	459	Fair to Good
Concrete Median Barrier	Between Ramps EB and ED, Ramp EC median	344	Good
Box Beam Guide Rail	Ramps EC and ED, right side	295	Good
Box Beam Guide Rail	West of Elmwood Avenue overpass, left side	410	Good
Box Beam Guide Rail	East of Elmwood Avenue overpass, left side	131	Good, to be replaced under PIN 5470.30
Box Beam Guide Rail	West of Elmwood Avenue overpass, right side	148	Good, to be removed under PIN 5470.30
Concrete Barrier	At Elmwood Avenue overpass, left side	276	Good, pier protection to be replaced under PIN 5470.30
Concrete Barrier	At Elmwood Avenue overpass, right side	125	Good, pier protection to be removed under PIN 5470.30

Exhibit 2.3.3.8
Existing Guide Railing, Median Barriers, and Impact Attenuators

Type	Location/Side	Length (feet)	Condition
Box Beam Guide Rail	At bridge over Scajaquada Creek and overhead sign structure west of Lincoln Parkway, right side	262	Good
Box Beam Guide Rail	Ramp EK, left side	295	Good
Box Beam Guide Rail	Ramp EK right side and left side of mainline from Ramp EK to Lincoln Parkway	1,132	Good
Steel-Backed Timber Guide Rail	At pedestrian bridge and toward Delaware Avenue, left side	755	New
Steel-Backed Timber Guide Rail	At pedestrian bridge, right side	400	New
Steel-Backed Timber Guide Rail	West of Delaware Avenue at tennis courts to Ramp DE, left side	620	New
Box Beam Guide Rail	Overhead sign structure west of Delaware avenue, right side	138	Poor with rusting
Box Beam Guide Rail	East approach to Delaware Avenue bridge barrier, left side	49	Fair
Box Beam Guide Rail	West approach to Delaware Avenue bridge barrier, right side	66	Fair
Concrete Barrier	On Delaware Avenue bridge and east approach, left side	344	Fair to Good with some cracking and spalls
Concrete Barrier	On Delaware Avenue bridge and west approach, right side	344	Fair to Good with some cracking and spalls
Wood Guide Rail	Ramp DF, right side	256	Fair to Good
Wood Guide Rail	Ramp DE	180	Fair to Good
Corrugated Beam Median Barrier	Between Ramps DA and DB	617	Fair to Good, located behind curb.
Box Beam Guide Rail	West of park maintenance building, right side	131	Poor with heavy rusting
Steel-Backed Timber Guide Rail	East of Delaware Avenue Bridge to Police Radio Building, left side	810	New
Steel-Backed Timber Guide Rail	East of Police Radio Building to Delaware Park parking area, left side	1,460	New
Box Beam Guide Rail	Overhead sign structure west of Parkside Avenue, right side	138	Fair
Steel-Backed Timber Guide Rail	Buffalo Park Maintenance Building to Parkside Avenue, right side	250	New

Notes to Exhibit 2.3.3.8:

1. Table is generally listed from west to east.
2. For NYS Route 198 mainline, left and right are referenced looking east.
3. For ramps, left and right are referenced in the direction of travel.

In general, box beam guide rail is treated with NYSDOT Type I and Type II end sections. On each approach to the Parkside Avenue intersection, the corrugated beam median barrier has turned down ends and anchorages that are not National Cooperative Highway Research Program (NCHRP) 350 compliant. Current practice is to replace these types of end assemblies with an attenuator. Steel-backed timber guide rail was installed within Delaware Park in the summer of 2015.

2.3.3.9. Utilities

Utilities within the project limits include underground gas, water lines, sanitary sewer, storm sewer, and fiberoptic cable. There are also overhead electric, cable, and telecommunication lines. Existing underground and overhead utilities are shown on the plans contained in **Appendix A2** and are summarized in the *Utilities Facilities Inventory Report (HC 203)* included in **Appendix A1 as Exhibit 2.3.3.9**. Physical surface features such as manholes, valve boxes, hydrants, and utility poles were field located. Record information provided by utility owners was also used. Depths have not been field verified.

2.3.3.10. Railroad Facilities

There are no railroads within the project limits and no at-grade crossings within one mile of the project limits that would impact traffic conditions.

2.3.4. Potential Enhancement Opportunities

This section identifies existing landscape elements within the project area to assist in the development of enhancement opportunities and help minimize potential adverse impacts.

2.3.4.1. Landscape

A site investigation was performed along the NYS Route 198 corridor to assess the physical and visual value of the existing roadside environment. Vegetation within the project limits is varied, ranging from formal gardens, manicured golf courses, pastoral park meadows, and forested park groves to densely vegetated areas along the banks of Scajaquada Creek. Several brownfields exist at the western end of the corridor with large expanses of sparsely vegetated parking lots fronting the corridor.

2.3.4.1. (1) Terrain

The terrain within the project limits is classified at rolling per Section 2.5.2 of the NYSDOT HDM.

2.3.4.1. (2) Unusual Weather Conditions

There are no unusual weather conditions within the project area that would affect the design and construction of the project. Snow and ice events experienced within the project limits during the winter months are typical of Western New York and the Buffalo region.

2.3.4.1. (3) Visual Resources

Delaware Park and Forest Lawn Cemetery are the major visual resources of the project area. Notable visual features of the park include:

- Parkside Lodge
- Marcy Casino
- Hoyt Lake
- Mirror Lake
- Rumsey Woods
- Rose Garden
- The Ivy Bridge
- Japanese Garden

Scajaquada Creek is also a visual resource within the project area. The densely vegetated banks provide a near continuous vegetative screen and border along the north side of the Scajaquada Expressway for roughly half its length.

Manmade visual resources include several works of art, including a reproduction of Michelangelo's David, The Spirit of Womanhood, by Larry W. Griffis, Jr., and several buildings (the Buffalo History Museum, the Albright-Knox Art Gallery, and the Church of the Assumption twin towers and school). The Grant Street Bridge and Elmwood Avenue Bridge feature architectural treatments.

For additional information on existing visual resources, refer to the Visual Impact Assessment in **Appendix B7.**

2.3.4.2. Opportunities for Environmental Enhancements

Practical opportunities for environmental enhancements could include the following:

- A new shared-use path bridge between NYS Route 198 and the Jesse Kregal Pathway near Buffalo State College;
- A new shared-use path along the south side of Scajaquada Creek between the new shared-use path bridge at Buffalo State College and Elmwood Avenue;
- A new shared-use path bridge over Scajaquada Creek at Mirror Lake;
- Construction of shared-use paths and footpaths in approximately the same alignment as historic trails within Delaware Park where practical;
- A new footpath along the south side of NYS Route 198 between Delaware Avenue and Parkside Avenue;
- Enhanced access to the McMillan Monument;
- Bicycle and pedestrian enhancements to South Meadow Drive within Delaware Park between Delaware Avenue and Parkside Avenue; and
- Enhanced gateway features.

TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT / FINAL 4(f) EVALUATION

CHAPTER 3 ALTERNATIVES

November 2017

PIN 5470.22
NYS Route 198 (Scajaquada Expressway) Corridor
Grant Street Interchange to Parkside Avenue Intersection
City of Buffalo
Erie County

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

ANDREW M. CUOMO
Governor

CATHY CALHOUN
Acting Commissioner

U.S. Department of Transportation
Federal Highway Administration

CHAPTER 3 – ALTERNATIVES

This chapter discusses the alternatives for the New York State (NYS) Route 198 (Scajaquada Expressway) Corridor Project (hereafter, "the Scajaquada Corridor Project" or "the project") that were determined to be feasible and practical, as well as those potential alternatives that were dismissed from further consideration.

3.1. Potential Alternatives Dismissed from Further Consideration

Several potential alternatives were considered during the scoping phase of this project and subsequently dismissed from further study (listed in **Exhibit 3.1**). Details regarding those potential alternatives and the reasons for their dismissal are documented in the *Scoping Document* published by the NYS Department of Transportation (NYSDOT) in May of 2016 and available for review at the following location: https://www.dot.ny.gov/scajaquadacorridor/reports.

Exhibit 3.1
Potential Alternatives Dismissed from Further Consideration

Potential Alternative	Description
Alternative 1A: Expressway	Upgrade elements of NYS Route 198 to meet current NYSDOT design standards for a non-interstate freeway to the greatest extent feasible and practical.
Alternative 3: Street	Transform NYS Route 198 into a street with one travel lane in each direction, primarily along the existing alignment.
Alternative 4: Removal	Remove NYS Route 198 from Delaware Park, between Elmwood Avenue and Parkside Avenue.

Alternative 1A was dismissed from further consideration because it would not meet the stated purpose of providing enhanced compatibility with adjacent land uses. Nearly 15 acres of parkland would be acquired and a tennis court, comfort station, and the City of Buffalo Park Maintenance Facility would be impacted. Elevated highway features would negatively impact the visual environment. The expressway would remain a physical barrier, hindering pedestrian and bicyclist travel. It would not be possible to completely eliminate all non-standard and/or non-conforming features from the design. Closely spaced interchange ramps and closely spaced local street intersections would not improve operations or enhance safety.

Alternative 3 was dismissed because it would not provide sufficient capacity to meet the anticipated vehicular traffic demand along the corridor and would result in an unacceptable level of traffic diversion to the adjacent local street network, and thus would not meet the stated project purpose of maintaining a critical transportation link between Interstate 190 (I-190) and NYS Route 33. Traffic studies completed during the scoping phase indicated that intersections along a two-lane NYS Route 198 from Grant Street to Parkside Avenue would operate inefficiently during the morning and evening rush hours. Excessive delays would occur where connecting roadways from Grant Street, Elmwood Avenue, and Delaware Avenue would meet the two-lane street and at the Parkside Avenue intersection.

Alternative 4 was dismissed because it would result in substantial congestion, delay, and potential air quality impacts on the adjacent local street system and would not meet the stated purpose of maintaining a critical transportation link between I-190 and NYS Route 33 by physically removing a portion of the roadway. Traffic analyses were conducted in cooperation with the Greater Buffalo Niagara Transportation Council (GNBRTC) using its calibrated regional travel demand model. The model was used to predict changes in traffic patterns that would occur as a result of this potential alternative. The nearest, convenient parallel routes around Delaware Park include Delevan Avenue (to the south) and Amherst Street (to the north). Hertel Avenue would also be used as a replacement route to the north for former expressway traffic. Large traffic volumes would be diverted to these roadways and other adjacent local streets including Nottingham Terrace, Middlesex Road, Forest Avenue, and Parkside Avenue. Increased traffic on the local street system during rush hour would cause local intersections to operate inefficiently, resulting in congestion, delay, and potential air quality impacts. Mitigating these impacts would, in turn, impact established homes, businesses, and neighborhoods.

3.2. Project Alternatives

Based on the project purpose, objectives, needs and public input, a single reasonable (feasible and practical) alternative was identified and developed for study in the Draft Design Report and Environmental Impact Statement (DDR/DEIS). Consideration was given to different individual features (options) based on public comments, stakeholder input, coordination with multiple agencies, and engineering studies. Consideration was also given to comments received on the DDR/DEIS and input gathered at the public hearing during the development of this Final Design Report and Environmental Impact Statement (FDR/FEIS).

3.2.1. Description of Project Alternatives

Alternative 1: No-Build Alternative

The No-Build Alternative assumes no improvements within the project limits besides those planned by others or implemented as part of routine maintenance. The roadway would remain incompatible with its surroundings, retain geometric features that do not meet current design standards, continue to impede bicycle and pedestrian travel within the corridor, continue to promote a disparity between vehicular operating speeds, the posted speed limit, and the design speed, fail to address undesirable accident rates and severities, and result in the continued deterioration of the existing pavement, drainage, and lighting systems. Although the No-Build Alternative does not meet the project purpose and objectives, it serves as the baseline condition against which the potential benefits and impacts of the Build Alternative are evaluated.

Alternative 2: Boulevard (Build Alternative)

To address the incompatibility of the expressway with the park and adjacent land uses, along with the geometric and operational deficiencies discussed in **Chapter 2**, the Build Alternative would transform NYS Route 198 from an urban expressway into an urban boulevard with two travel lanes in each direction between Grant Street and Parkside Avenue, in its current location. It is depicted in **Exhibit 1.3-1**. Boulevards are median divided urban thoroughfares with at-grade intersections. They typically have more than one lane in each direction. Ramps at Grant Street, Elmwood Avenue, and Delaware Avenue would be replaced with connecting roadways. Graphics illustrating the roundabout and Grant Street Connectors, Elmwood Avenue Connector, and Delaware Avenue Connector are available as **Exhibit 3.2.1-1**, **Exhibit 3.2.1-2**, and **Exhibit 3.2.1-3**, respectively. The Parkside Avenue intersection would remain (Refer to **Exhibit 3.2.1-4**). A new intersection would be created at the entrance to the City of Buffalo Parks Maintenance Facility.

Upon completion of the project, the NYSDOT would pursue changing the functional classification of NYS Route 198 from an Urban Principal Expressway to an Urban Minor Arterial. The Build Alternative would accommodate motor vehicles, bicycles, and pedestrians within the project limits. The roadway design would conform to accepted standards for an urban arterial. To provide a facility that is more compatible with the park, some additional congestion and delay (Refer to **Section 3.3.1.7**) is anticipated at intersections during rush hour. Documented deficiencies of the existing drainage system would be addressed by replacing much of the system. Driver expectation of the facility and its design would be aligned, enhancing overall safety. Additional and enhanced pedestrian and bicycle crossing opportunities would be created near Buffalo State College, Elmwood Avenue, Lincoln Parkway, Hoyt Lake, Delaware Avenue, Delaware Park, and at Parkside Avenue.

The parameter “design speed” is used to guide the selection of other criteria that shape the geometric features of a roadway. A design speed is typically set considering context, such as classification of the roadway, the type and volume of traffic using the roadway, topography, surrounding land use, and the character of adjacent roadway segments. The design speed for this project would be set at 35 miles per hour between Grant Street and Parkside Avenue. The existing 30 mile per hour posted speed limit would be retained.

Details of the Build Alternative include:

Project Type	• Reconstruction
Functional Classification	• Conversion to an Urban Minor Arterial - Other would be pursued upon completion of the project
Geometry	• Convert 2.2 miles of NYS Route 198 into an urban boulevard from the Grant Street interchange to the Parkside Avenue intersection. • Install two 11-foot-wide travel lanes in each direction. • Separate eastbound and westbound traffic using a median, typically 8 feet wide measured from yellow stripe to yellow stripe, including a 20-inch high, 4-foot wide “low-profile” concrete barrier down the middle. The median would become wider at pedestrian crossings, narrower on some intersection approaches, and be eliminated on the bridge over Delaware Avenue. • Install a five-foot wide shoulder and curb along the outside edges of the roadway. • Remove the existing ramps at the Grant Street, Elmwood Avenue, and Delaware Avenue interchanges and replace them with connector (quadrant) roadways. The grade separations (overpasses) would remain. • Construct a modern roundabout at the intersection of NYS Route 198 and the southern Grant Street connector. • Provide access to eastbound and westbound traffic on NYS Route 198 at the entrance to the City of Buffalo Parks Maintenance Facility. • Retain the existing (at-grade) Parkside Avenue intersection, but complete upgrades to improve alignment and safety. Changes would include the elimination of westbound and southbound turning roadways (slip lanes). • Follow the existing horizontal and vertical alignments of the existing facility to the greatest extent feasible and practical. Add additional horizontal curvature between the pedestrian overpass and Delaware Avenue to reflect the historic alignment of a bridle path that predated the Scajaquada Expressway and to promote traffic calming. • Construct three raised intersections on NYS Route 198 at the Elmwood Avenue Connector, Delaware Avenue Connector, and Parkside Avenue. Construct raised pedestrian and bicycle crossings at four additional locations along NYS Route 198 including near Buffalo State College, Mirror Lake, Hoyt Lake, and at the Buffalo Parks Maintenance Facility. • Include some non-standard and non-conforming features as described in **Section 3.3.3.2 (1)**. Justifications for non-standard features are included in **Appendix F**.
Operational	• Retain the existing posted speed limit of 30 miles per hour from Grant Street to Parkside Avenue. Speed transition zones may be developed on the viaduct and between Parkside Avenue and NYS Route 33 as separate, independent future actions. • Install new intersection traffic signals where NYS Route 198 meets the northern Grant Street Connector, Elmwood Avenue Connector, southern Lincoln Parkway Connector, Delaware Avenue Connector, and at the entrance to the City of Buffalo Parks Maintenance Facility.

- Retain stop control on the entrance to NYS Route 198 from the northern Lincoln Parkway Connector.
- Install three-color signals at four new mid-block crossings of NYS Route 198 near Buffalo State, Mirror Lake, Hoyt Lake, and Delaware Park, resulting in a signal spacing of approximately 900 feet to benefit coordination.
- Operate all signals along NYS Route 198, with the exception of Parkside Avenue, as part of an actuated-coordinated system during the peak hours of traffic to balance the accommodation of vehicles and enhanced pedestrian and bicycle connectivity.
- Operate all signals along NYS Route 198, including Parkside Avenue, as part of a pre-timed, coordinated system during off-peak hours of traffic to promote vehicular travel speeds compatible with the 30 mile per hour posted speed limit.
- Make signing and traffic signal changes at two intersections on adjacent city streets to mitigate the anticipated adverse impacts of the Build Alternative on local traffic.

Pavement

- Reconstruct the existing pavement on NYS Route 198 within the project limits. Reconstruction limits would be set as needed to transition between existing roadways and those reconstructed by the Build Alternative.
- Reconstruct, widen, or mill and resurface existing pavements on local streets as needed to tie the existing roadways into those reconstructed by the Build Alternative.

Structures

- Remove bridges carrying Ramps GE and GF over Scajaquada Creek and construct a new structure for the proposed Grant Street Connector roadway.
- Remove the bridge carrying Ramps EB and ED over Scajaquada Creek and construct a new structure for the proposed Elmwood Connector roadway. Also remove BIN 1039970, Elmwood Avenue Ramp EK over Scajaquada Creek.
- Rehabilitate the bridge carrying NYS Route 198 over Scajaquada Creek (BIN 1039989), including modifications needed to accommodate a new roadway and path configuration.
- Modify the roadway on the bridge carrying NYS Route 198 over Delaware Avenue (BIN 1047259) to accommodate a new roadway, path, and sidewalk configuration.
- Construct two new shared-use path bridges over Scajaquada Creek: one at the Buffalo State College Crossing and one just west of Mirror Lake.
- Complete minor concrete repairs, install new joints, and perform localized spot painting on the pedestrian bridge over NYS Route 198 (BIN 1039990).
- Construct retaining walls as required to allow for shared-use path and/or roadway construction adjacent to Scajaquada Creek.

Pedestrian & Bicyclist	• Sign NYS Route 198 as a bicycle route from Grant Street to Parkside Avenue after the roadway's functional classification is changed. • Install new, signalized, raised pedestrian and bicycle crossings of NYS Route 198 (midblock and at intersections). • Install new curb ramps and crosswalks at various locations along NYS Route 198 and affected intersections. Include refuge islands at new intersection crossings located along NYS Route 198 and the connector roadways. • Install new 10-foot-wide shared-use paths and five-foot-wide foot paths at several locations along NYS Route 198 from Grant Street to Parkside Avenue. Where practical, new paths would follow the historic alignments of original paths within Delaware Park. • Develop new connections to the Jesse Kregal Pathway and other shared-use paths within Delaware Park, resulting in a separate, parallel, off-roadway system for pedestrian and bicyclist accommodation throughout the project limits. • Reconfigure the portion of South Meadow Drive from the Nottingham Terrace entrance to the parking area near Parkside Avenue to include a separate pedestrian walk and a marked two-way cycle track. • Construct two new shared-use path crossings of (bridges over) Scajaquada Creek. • Construct a new shared-use path between Lincoln Parkway and Elmwood Avenue that would allow bicyclists to bypass the existing path through the Japanese Gardens. • Install a raised, unsignalized crossing where the Jesse Kregal Pathway crosses the connector roadway between Nottingham Terrace and NYS Route 198 westbound.
Drainage	• Replace the existing stormwater system consisting of basins and pipes. • Employ stormwater treatment techniques that would enhance the quality of water discharged to adjacent water bodies including Scajaquada Creek, Hoyt Lake, and Mirror Lake. • Install new drainage structures with bicycle-friendly reticuline frames and grates.
Signing and Pavement Marking	• Remove existing overhead guide signs, overhead sign structures, and any other remaining expressway-scale guide signs and replace them with appropriate, arterial-scale signing in accordance with *Manual on Uniform Traffic Control Devices* (MUTCD standards). • Install new pavement markings in accordance with MUTCD standards.
Control of Access	• Retain vehicular access to and from NYS Route 198 at Grant Street, Elmwood Avenue, Iroquois Drive, Lincoln Parkway, Delaware Avenue, the City of Buffalo Police Radio building, the City of Buffalo Parks Maintenance Facility, and Parkside Avenue. Add a new driveway from the Delaware Park parking lot to NYS Route 198 westbound.

Right of Way	• Acquire right-of-way, permanent easements, and concurrent use and occupancy agreements required for construction and future maintenance activities. All property will be acquired in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended. • Establish formal highway boundaries along NYS Route 198 from Delaware Avenue to Parkside Avenue where they have not previously existed. • Acquire temporary easements for the purposes of constructing shared-use paths, footpaths, roadways, and other features. • Explore transferring any parcels of right-of-way that do not need to be retained for the permanent facilities being constructed as part of this project to the adjacent owner(s).
Environmental	• There would be a 16% decrease in impervious area and a decrease in pollutant loadings to Scajaquada Creek and Hoyt Lake ranging from 9 to 59% with the Build Alternative. • There would be an Adverse Effect on identified archaeological properties.. • A total of 2.73 acres would be acquired from land currently being used as parkland in the form of a full property acquisition or permanent easements. This would be offset by 5.65 acres of land that would be converted to park use, yielding a 2.92 acre net increase in parkland. • There would be noise impacts to six sites, but no perceptible change in noise levels
Landscaping and Enhancements	• Install plantings along the roadside and in median areas wider than 6 feet. • Install Olmsted Parkway style lighting along NYS Route 198. • Construct gateway features at appropriate locations along the corridor. • Improve pedestrian access to the McMillan Monument. • Relocate the sculpture titled “Spirit of Womanhood”.

Construction Cost and Staging	• The current estimate for complete construction of the Build Alternative is $103.9 million (M).
	• The project would be built in stages:
	  ◦ Stage 1 (2017-2018) – Delaware Avenue to Parkside Avenue ($35.5 M)
	  ◦ Stage 2 (2018-2019) – Elmwood Avenue Section ($39.1 M)
	  ◦ Stage 3 (2019-2020) – Grant Street Section ($29.4 M)
	Stages 1 and 2 would be part of one construction contract (Contract 1) and Stage 3 would follow (Contract 2).
	Refer to **Exhibit 3.2.1-5** for a summary of costs.

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NOTE:
REFER TO GENERAL PLAN DRAWINGS SHOWN FOR ADDITIONAL DETAIL AND DIMENSIONS.

GRID NORTH

GP-27

GRANT STREET

NY RTE 198 WB CONNECTOR TO GRANT STREET

SCAJAQUADA CREEK

GP-2

GP-3

GP-4

GP-5

NY RTE 198 WB

NY RTE 198 EB

NY ROUTE 198 ROUNDABOUT

NY RTE 198 EB CONNECTOR TO GRANT STREET

IROQUOIS DRIVE

GP-26

50 0 50 100 150 200′

1" = 100′

AFFIX SEAL: ON:	ALTERED BY: ON:

AS-BUILT REVISIONS
DESCRIPTION OF ALTERATIONS:

N.Y. ROUTE 198 (SCAJAQUADA EXPRESSWAY CORRIDOR)

CITY OF BUFFALO

COUNTY: ERIE

PIN 5470.22

SEPTEMBER 2017

CULVERTS

ALL DIMENSIONS IN ft UNLESS OTHERWISE NOTED

INTERSECTION PLAN GRANT STREET CONNECTORS

ALTERNATIVE 2
(PREFERRED ALTERNATIVE)

CONTRACT NUMBER
D031048-04

DRAWING NO. ILP-1

EXHIBIT 3.2.1-1

BERGMANN ASSOCIATES

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

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JOB MANAGER
DESIGN SUPERVISOR

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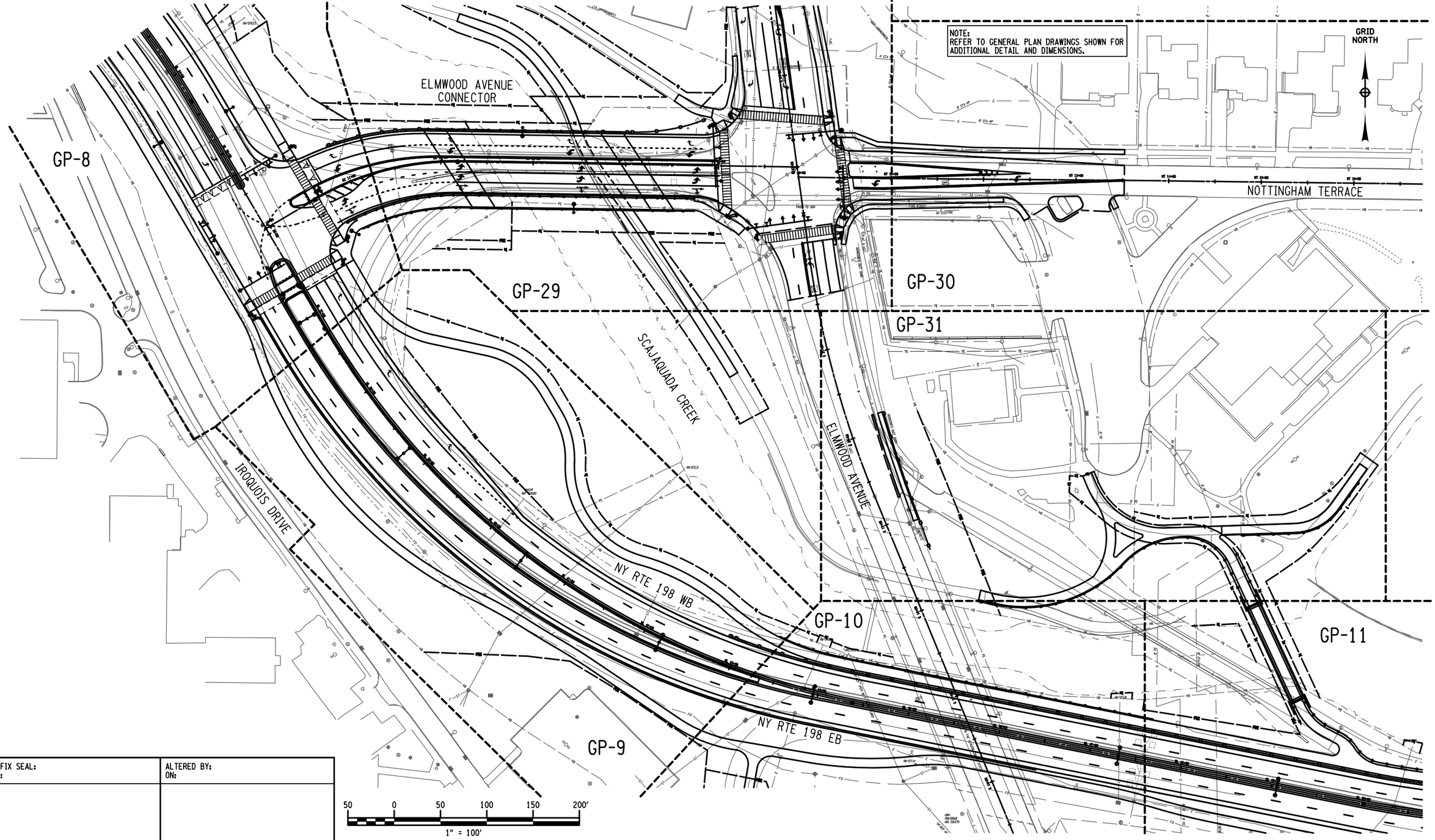

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AS-BUILT REVISIONS
DESCRIPTION OF ALTERATIONS:

N.Y. ROUTE 198 (SCAJAQUADA EXPRESSWAY CORRIDOR)

CITY OF BUFFALO

COUNTY: ERIE

PIN 5470.22

SEPTEMBER 2017

CULVERTS

ALL DIMENSIONS IN ft UNLESS OTHERWISE NOTED

INTERSECTION PLAN
ELMWOOD AVENUE CONNECTOR

ALTERNATIVE 2
(PREFERRED ALTERNATIVE)

CONTRACT NUMBER
D031048-04

DRAWING NO. ILP-2
EXHIBIT 3.2.1-2

BERGMANN ASSOCIATES

NEW YORK STATE of OPPORTUNITY. Department of Transportation

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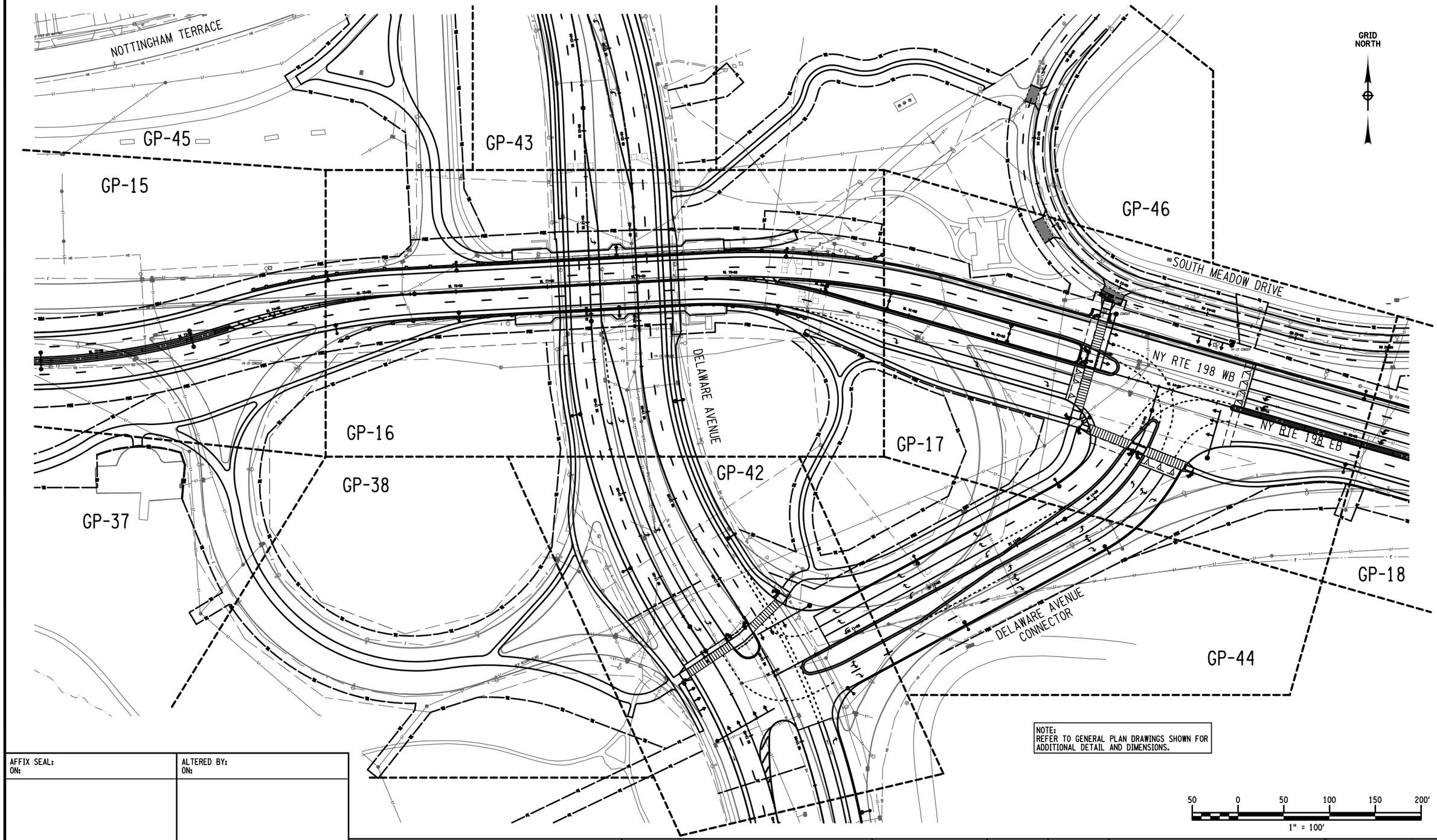

NOTE:
REFER TO GENERAL PLAN DRAWINGS SHOWN FOR ADDITIONAL DETAIL AND DIMENSIONS.

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1" = 100′

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AS-BUILT REVISIONS
DESCRIPTION OF ALTERATIONS:

N.Y. ROUTE 198 (SCAJAQUADA EXPRESSWAY CORRIDOR)

CITY OF BUFFALO

COUNTY: ERIE

PIN 5470.22

SEPTEMBER 2017

CULVERTS

ALL DIMENSIONS IN ft UNLESS OTHERWISE NOTED

INTERSECTION PLAN DELAWARE AVENUE CONNECTOR

ALTERNATIVE 2
(PREFERRED ALTERNATIVE)

CONTRACT NUMBER
D031048-04

DRAWING NO. ILP-3
EXHIBIT 3.2.1-3

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NEW YORK STATE OF OPPORTUNITY. Department of Transportation

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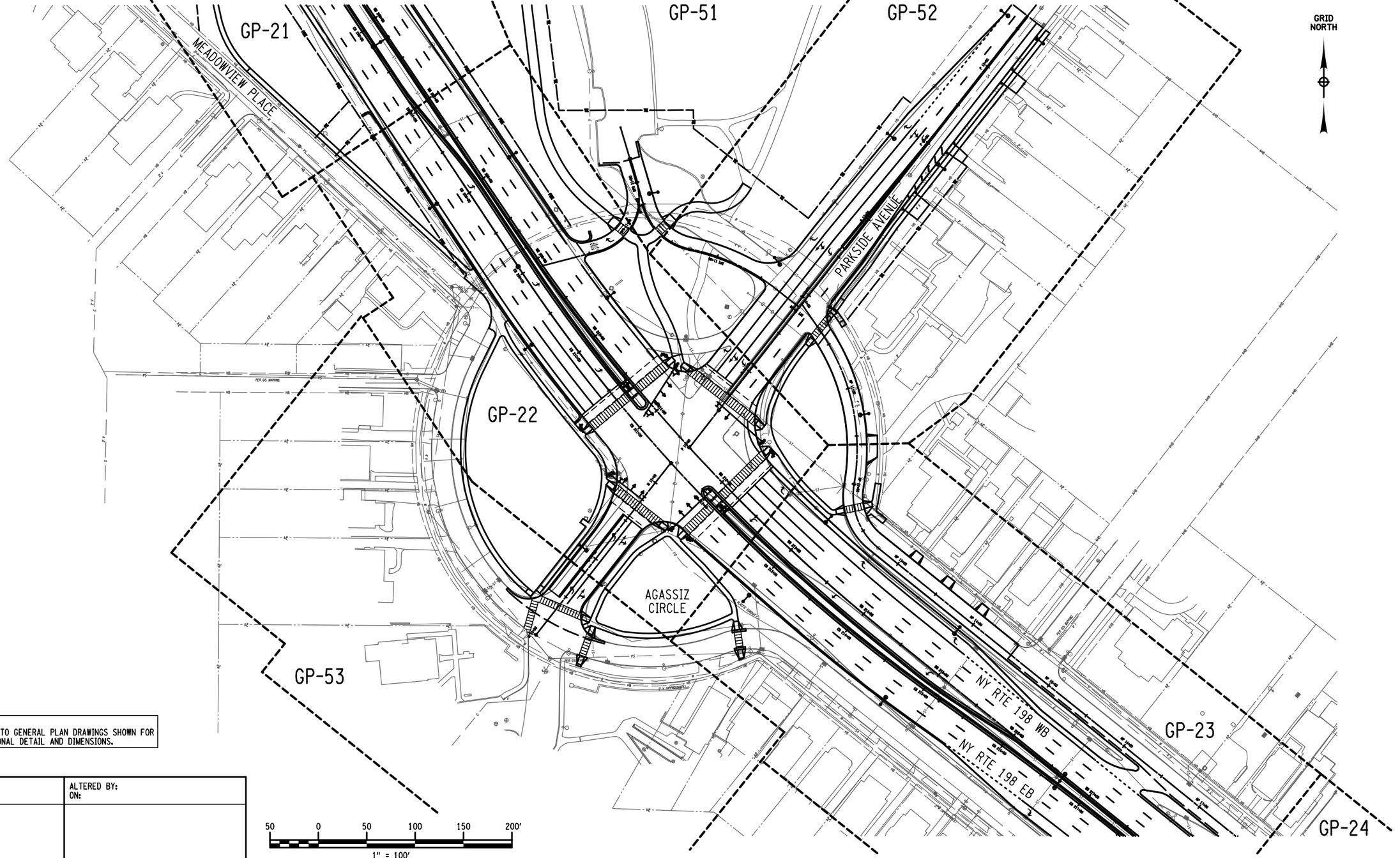

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AS-BUILT REVISIONS
DESCRIPTION OF ALTERATIONS:

N.Y. ROUTE 198 (SCAJAQUADA EXPRESSWAY CORRIDOR)

CITY OF BUFFALO

COUNTY: ERIE

PIN 5470.22

SEPTEMBER 2017

CULVERTS

ALL DIMENSIONS IN ft UNLESS OTHERWISE NOTED

INTERSECTION PLAN
PARKSIDE AVENUE

ALTERNATIVE 2
(PREFERRED ALTERNATIVE)

CONTRACT NUMBER
D031048-04

DRAWING NO. ILP-4
EXHIBIT 3.2.1-4

BERGMANN ASSOCIATES

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

PROJECT MANAGER
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DESIGN SUPERVISOR

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Exhibit 3.2.1-5
Summary of Probable Construction Costs for the Build Alternative (2017 Dollars)

Activities		Contract 1		Contract 2	Total All Stages
		Stage 1 (Delaware Ave to Parkside Ave) ±4,900 ft	Stage 2 (Elmwood Ave Section) ±4,400 ft	Stage 3 (Grant St Section) ±3,900 ft	
Construction	Bridge[5,6]	$1,200,000	$8,700,000	$4,110,000	$14,010,000
	Highway[7]	$23,196,000	$18,191,000	$14,655,000	$56,042,000
Off-Site Intersection Improvements[10]		$100,000	$0	$0	$100,000
Wetland and Stream Mitigation / Enhancement[10]		NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED
Hazardous Waste Remediation[10]		$0	$25,000	$50,000	$75,000
Public Utility Relocations (Water and Sanitary Sewer)[10]		$100,000	$100,000	$100,000	$300,000
Subtotal (2017)		$24,596,000	$27,016,000	$18,915,000	$70,527,000
Aesthetic Treatments, Gateways, and Misc Landscaping[8] (7.6%)		$1,873,000	$2,120,000	$1,434,000	$5,427,000
Subtotal (2017)		$26,469,000	$29,136,000	$20,349,000	$75,954,000
Incidentals[1] (5%)		$1,323,000	$1,457,000	$1,017,000	$3,797,000
Subtotal (2017)		$27,792,000	$30,593,000	$21,366,000	$79,751,000
Contingencies[2] (15% @ Design Approval)		$4,169,000	$4,589,000	$3,205,000	$11,963,000
Subtotal (2017)		$31,961,000	$35,182,000	$24,571,000	$91,714,000
Potential Field Change Order[3]		$1,040,000	$1,100,000	$890,000	$3,030,000
Subtotal (2017)		$33,001,000	$36,282,000	$25,461,000	$94,744,000
Mobilization (4%)		$1,320,000	$1,451,000	$1,018,000	$3,789,000
Subtotal (2017)		$34,321,000	$37,733,000	$26,479,000	$98,533,000
Year of Estimate		2017	2017	2017	-
Anticipated Construction Midpoint		2018	2018	2020	-
Assumed Rate of Annual Inflation		3.50%	3.50%	3.50%	-
Inflation Factor to Project Midpoint		104%	104%	111%	-
Expected Award Amount - Inflated[4] @ 3.5%/yr to midpoint of Construction		$35,522,000	$39,054,000	$29,358,000	$103,934,000
Construction Inspection[11](8%)		$2,842,000	$3,124,000	$2,349,000	$8,315,000
ROW Costs (2017)[12]		$398,000	$395,000	$490,000	$1,283,000
Total Cost[9]		**$38,800,000**	**$42,600,000**	**$32,200,000**	**$113,600,000**

Notes:

1 The potential cost increase due to unknown or un-tabulated items.
2 NYSDOT recommends standard contingencies: 25% Scoping stage, 15% Design Approval stage, 5% Advanced Detail Plans stage.
3 According to HDM Chapter 21 Section 21.4.3.3, EB 03-029 & EB 06-057, and EI 07-024.
4 An escalation rate of 3.5% was utilized to account for potential increases in labor, material, equipment and other costs associated with Capital Program work.
5 Costs for new/replacement bridges developed using NYSDOT Shoulder Break Worksheet.
6 Includes cost of large retaining walls
7 Highway Construction Cost includes assumed costs for staged construction tie-ins, ITS relocations, survey operations, work zone traffic control, temporary erosion control, and field office and other miscellaneous Section 637 items.
8 8.5% for Aesthetic Treatments, Gateways, and Misc. Landscaping was utilized for the Design Approval stage.
9 Rounded to the nearest $100,000.
10 Additional engineering and coordination required during detailed design to develop refined estimates.
11 8% utilized for Construction Inspection at the Design Approval stage.
12 ROW costs based upon property value estimates.

3.2.2 Preferred Alternative

The Build Alternative described in Section 3.2.1 is the preferred alternative for the project. Plans, profiles, and typical sections for the Build Alternative are included in **Appendix A2**. The selected alternative will be identified in the Record of Decision in consideration of comments received on the DDR/DEIS, from the public hearing, and on this FDR/FEIS.

3.2.3. Design Criteria for the Build Alternative

Roadways, ramps, bridges, and paths to be reconstructed or rehabilitated under the Build Alternative are listed below. Ramps to be removed, bridges to be removed, and bridges to remain are also listed.

Roadways to be Reconstructed

- NYS Route 198: Grant Street interchange to the Parkside Avenue intersection
- Grant Street: 870 feet south of the bridge over NYS Route 198 (BIN 1039910) to the approach slab
- Elmwood Avenue: bridge over NYS Route 198 (BIN 1039969) to Nottingham Terrace intersection
- Nottingham Terrace: approach to Elmwood Avenue
- Delaware Avenue (NYS Route 384) from Forest Lawn Cemetery to Nottingham Terrace
- Parkside Avenue: 575 feet to the north from NYS Route 198
- Humboldt Parkway and Agassiz Circle: Approaches to Parkside Avenue

Ramps to be Removed

- Grant Street Interchange: Ramps GB, GC, GE, and GF
- Elmwood Avenue Interchange: Ramps EB, EC, ED, EF, EI, and EK
- Delaware Avenue Interchange: Ramps DA, DB, DC, DD, DE, and DF

New or Reconstructed Connector Roadways

- Southern Grant Street Connector: NYS Route 198 to Grant Street (at proposed roundabout)
- Northern Grant Street Connector: NYS Route 198 westbound to Grant Street
- Elmwood Avenue Connector
- Delaware Avenue Connector
- Southern Lincoln Parkway Connector to NYS Route 198 eastbound
- Northern Lincoln Parkway Connector to NYS Route 198 westbound

Bridges to be Removed

- Ramp GE over Scajaquada Creek (BIN 1039940)
- Ramp GF over Scajaquada Creek (BIN 1039930)
- Ramp EK over Scajaquada Creek (BIN 1039970)
- Ramp EC (EB/ED) over Scajaquada Creek (BIN 1039959)

New Bridges

- Northern Grant Street Connector over Scajaquada Creek
- Shared-use Path Bridge over Scajaquada Creek: Buffalo State Crossing
- Shared-use Path Bridge over Scajaquada Creek: Mirror Lake Crossing
- Elmwood Avenue Connector

Widened, Rehabilitated, or Otherwise Modified Bridges

- NYS Route 198 over Scajaquada Creek (BIN 1039989)
- Pedestrian Bridge over NYS Route 198 (BIN 1039990) (miscellaneous repairs only)
- NYS Route 198 over Delaware Avenue (NYS Route 198) (BIN 1047259)

New or Reconstructed Paths

- Segments of and connections to the Jesse Kregal Pathway
- New shared-use path connections within Delaware Park
- New foot paths within and adjacent to Delaware Park

3.2.3.1. Design Standards

The following design standards and resources were consulted to develop the critical design element and other design element parameters for this project:

- NYSDOT *Highway Design Manual* (HDM),
- NYSDOT *Bridge Manual*, *1st Edition, Addendum #3* (2014) (BM)
- American Association of State Highway and Transportation Officials (AASHTO) *LRFD Guide Specifications for the Design of Pedestrian Bridges, 2nd Edition* (2015)
- AASHTO *Guide for the Development of Bicycle Facilities, 4th Edition* (2012)
- *National Manual on Uniform Traffic Control Devices for Streets and Highways, Current Edition* (MUTCD)
- *New York State Supplement to the National Manual on Uniform Traffic Control Devices for Streets and Highways*, *2009 Edition* (2011)
- National Association of City Transportation Officials (NACTO) *Urban Street Design Guide, 1st Edition* (2013)

3.2.3.2. Critical Design Elements

The design criteria applicable to this project consist of critical elements as described in the NYSDOT HDM (Chapter 2). Other design parameters, such as design vehicle, are found either in the NYSDOT HDM, the AASHTO Green Book, or other references. A list of the typical critical design elements that apply to this project is included in **Exhibit 3.2.3.2-1**.

Exhibit 3.2.3.2-1
Critical Design Elements Summary

1. Design Speed	9. Horizontal Clearance
2. Lane Width	10. Vertical Clearance
3. Shoulder Width	11. Pavement Cross Slope
4. Bridge Roadway Width	12. Rollover[1]
5. Maximum Grade	13. Structural Capacity
6. Horizontal Curvature	14. Control of Access
7. Superelevation Rate	15. Pedestrian Accommodation
8. Stopping Sight Distance	

Notes:
1. Rollover is the change of grade between the cross slope of adjacent lanes or between travel lanes and the shoulder.

Design speed is the critical parameter used to determine the various geometric design features of a roadway. Design speed is typically selected in conformance with the functional classification of a roadway, its measured off-peak 85th percentile speed (the speed at or below which 85% of vehicles travel), topography, adjacent land use, and any contiguous planned improvements. Typical design methodology would result in a design speed comparable with existing operating speeds. As summarized in **Section 2.3.1.5 (2)**, existing 85th percentile speeds on NYS Route 198 are in the range of 40 miles per hour.

The documented project needs include reducing the disparity between vehicular operating speeds, the posted speed limit, and the design speed while improving the compatibility of the roadway with its surroundings. Therefore, the NYSDOT has selected, in accordance with the FHWA publication *Flexibility in Highway Design*, a design speed of 35 miles per hour and design features that, along with enforcement, would encourage compliance with the 30 mile per hour posted speed limit. Traffic calming features would be incorporated into the project to encourage operating speeds consistent with the 30 mile per hour posted speed limit. Applicable traffic calming features are summarized in **Section 3.2.3.3**.

Critical design elements are presented in **Exhibits 3.2.3.2-2 through 3.2.3.2-9**. Standard criteria applicable to new construction and reconstruction projects for highways, streets, and bridges are included. The design standards used to develop this document comply with those in effect prior to May 1, 2017 when the DDR/DEIS was published for public and agency review. Refer to **Section 3.3.3.2 (1)** for a summary of critical design elements within the proposed reconstruction limits that would not meet current standards.

Exhibit 3.2.3.2-2
Critical Design Elements for NYS Route 198

PIN:	5470.22	NHS (Y/N):	Yes
Route No. & Name:	NYS Route 198	Functional Classification:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	2% to 5%	Terrain:	Rolling
ADT Two-Way (2040)	40,000 (max)	Truck Access/Qualifying Hwy.	Qualifying

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	35 mph HDM Section 2.7.2.2.A	Design Speed: 40 mph Posted Speed: 30 mph	Design Speed: 35 mph Posted Speed: 30 mph
2	Lane Width	12 ft (min) on a Qualifying Highway 14 ft shared lane width desirable to accommodate bicyclists HDM Section 2.7.2.2.B & Exhibit 2-4.	11 ft*	11 ft*
3	Turning Lane Width	11 ft (min) 12 ft (desirable) HDM Section 2.7.2.2.B & Exhibit 2-4	11 ft	11 ft
4	Shoulder Width (Left, Curbed)	0 ft (min) 1 - 2 ft (desirable) HDM Section 2.7.2.2.C & Exhibit 2-4	1 ft	Varies 1 ft to 2 ft
5	Shoulder Width (Right, Curbed)	A 0 ft to 4 ft shoulder may be used where a wide outside travel lane (12 ft min) or separate provisions (e.g. multi-use path) are provided. 5 ft (min) for bicycling, lateral offset, etc. 6 ft to 10 ft for breakdowns and turning movements. HDM Section 2.7.2.2.C & Exhibit 2-4	3 ft (min) and varies	5 ft typical [2],
6	Bridge Roadway Width	Full Approach Roadway Width BM Section 2.3	Refer to Structures Summary Table, **Appendix E**	Full Approach Roadway Width
7	Maximum Grade	8% HDM Section 2.7.2.2.E & Exhibit 2-4	4.15%	4.05%
8	Horizontal Curvature (Minimum)	371 ft (@ e = 4.0%) HDM Section 2.7.2.2.F & Exhibit 2-4	818 ft	400 ft
9	Superelevation Rate (Maximum)	4% Maximum HDM Section 2.7.2.2.G	Varies 4.2% to 5.7% and Normal Crown	1% at Parkside*, else 4% (max)
10	Stopping Sight Distance (Minimum)	250 ft (min) HDM Section 2.7.2.2.H & Exhibit 2-4	492 ft (min)	281 ft
11	Horizontal Clearance (From Face of Curb)	0 ft with barrier 1.5 ft without barrier 3 ft at intersections HDM Section 2.7.2.2.I	Varies	2 ft min. at low profile concrete barrier, else 1.5 ft and 3 ft at intersections 5 ft from EOT in Median

Exhibit 3.2.3.2-2
Critical Design Elements for NYS Route 198

PIN:	5470.22	NHS (Y/N):	Yes
Route No. & Name:	NYS Route 198	Functional Classification:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	2% to 5%	Terrain:	Rolling
ADT Two-Way (2040)	40,000 (max)	Truck Access/Qualifying Hwy.	Qualifying

	Element	Standard	Existing Condition	Proposed Condition
12	Vertical Clearance (Minimum)	14.0 ft (min) vehicular bridge, 14.5 ft (desirable) vehicular bridge, 15.0 ft (min) pedestrian bridge, 15.5 ft (desirable) pedestrian bridge, 15 ft (min) signs, 15.5 ft (desirable) signs, 15 -17 ft signals HDM Section 2.7.2.2.J, BM Section 2.4 & Table 2-2	Refer to Structures Summary Table, **Appendix E,** 14 ft @ Existing. Pedestrian Bridge*	14 ft @ Grant 14.8 ft @ Elmwood, 15 ft @ Existing Pedestrian Bridge
13	Travel Lane Cross Slope	1.5% (min) to 2% (max) HDM Section 2.7.2.2.K	0.5% to 3%, Parabolic Crown*	2%
14	Rollover (Maximum)	4% between lanes; 8% at edge of traveled way HDM Section 2.7.2.2.L	4% / 8% max	4% between travel lanes
15	Structural Capacity (Highway Bridges)	HL-93 and NYSDOT Design Permit Vehicle New/Replacement HS 20 Rehabilitation BM Section 2.6	> HS 20, Refer to Structures Summary Table, **Appendix E**	HL-93 and NYSDOT Design Permit Vehicle New/Replacement, HS 20 Rehabilitation
16	Structural Capacity (Pedestrian Bridges)	90 lb/ft^2 or H-10 AASHTO LRFD Guide Spec. for Pedestrian Bridges, 2nd Ed.	Existing Pedestrian Bridge Not Rated	90 lb/ft^2 or H-10 Prop. Ped. Bridges
17	Pedestrian Accommodation	5 ft minimum sidewalk/footpath 5 ft minimum bridge sidewalk HDM Section 2.7.2.2.N, HDM Chapters 17 & 18, and PROWAG	5 ft sidewalks on BIN 1047259,	10 ft shared-use path on BIN 1039989 7.7 ft shared-use path on BIN 1047259** (for shared-use path design criteria see **Exhibit 3.2.3.3-2**) 5 ft sidewalk on BIN 1047259

(1) * Non-Standard Feature
(2) Bicycles may use the 5 ft shoulder and travel lanes after the roadway's functional classification is changed
(3) BIN 1039989 is NYS Route 198 over Scajaquada Creek
(4) BIN 1047259 is NYS Route 198 over Delaware Avenue
(5) ** Non-Conforming Feature

Exhibit 3.2.3.2-3
Critical Design Elements for Connector Roadways
(Northern Grant Street, Southern Lincoln Parkway, & Northern Lincoln Parkway)

PIN:	5470.22	NHS (Y/N):	No
Route No. & Name:	Northern Grant Street, Southern Lincoln Parkway, and Northern Lincoln Parkway Connectors	Functional Classification:	Ramp (Non-Interstate, Turning Roadway for Grade Separated Highways)
Project Type:	Reconstruction	Design Classification:	Ramp (One Quadrant)
% Trucks:	2% to 5%	Terrain:	Rolling
ADT Two-Way (2040)	4,700 (max)	Truck Access/Qualifying Hwy.	No

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	25 mph HDM Section 2.7.5.2.A	N/A	25 mph
2	Traveled Way Width[1]	Refer to Cases IC and IIIC HDM Section 2.7.5.2.B & Exhibit 2-9b.	N/A	32 ft (min) Grant Connector (north) 16 ft Lincoln Connector (south) 13 ft Lincoln Connector (north)
3	Shoulder Width	0 ft (min) 2 ft (desirable) HDM Section 2.7.5.2.C & Exhibit 2-10, footnote 1	N/A	Var. 1 ft to 3 ft
4	Bridge Roadway Width	Full Approach Roadway Width BM Section 2.3	N/A	Full Approach Roadway Width
5	Maximum Grade	7% HDM Section 2.7.5.2.E & Exhibit 2-10	N/A	3.1% (max) Grant Connector (north) 6.7% (max) Lincoln Connector (south) 3.2% (max) Lincoln Connector (north)
6	Horizontal Curvature (Minimum)	144 ft (@ e = 6.0%) HDM Section 2.7.5.2.F & Exhibit 2-10	N/A	216 ft Grant Connector (north) 245 ft Lincoln Connector (south) 246 ft Lincoln Connector (north)
7	Superelevation Rate (Maximum)	6% Maximum HDM Section 2.7.5.2.G & Exhibit 2-13	N/A	5.6% Grant Connector (north) 2.0% Lincoln Connector (south)* 2.0% Lincoln Connector (north)*
8	Stopping Sight Distance (Minimum)	155 ft (min) HDM Section 2.7.5.2.H & Exhibit 2-10	N/A	473 ft Grant Connector 120 ft Lincoln Connector (south)* 521 ft Lincoln Connector (north)
9	Horizontal Clearance (From Face of Curb)	3 ft (min) left 6 ft (min) right HDM Section 2.7.5.2.I	N/A	3 ft (min) left 6 ft (min) right
10	Vertical Clearance (Minimum)	15 ft (min) signs, 15.5 ft (desirable) signs, 15 -17 ft signals 10 ft (min) over shared-use path HDM Section 2.7.5.2.J, BM Section 2.4 & Table 2-2	N/A	15-17 ft signals 8 ft over Shared-Use Path beneath Grant Connector (north) (Refer to **Section 3.2.2.3** and **Exhibit 3.2.2.3** for additional information
11	Travel Lane Cross Slope	1.5% (min) to 2% (max) HDM Section 2.7.2.2.K	N/A	2%
12	Rollover (Maximum)	4% between lanes; 8% at edge of traveled way HDM Section 2.7.2.5.L	N/A	4%
13	Structural Capacity (Highway Bridges)	HL-93 and NYSDOT Design Permit Vehicle New/Replacement BM Section 2.6	N/A	HL-93 and NYSDOT Design Permit Vehicle New/Replacement
14	Pedestrian Accommodation	HDM Section 2.7.5.2.P, HDM Chapters 17 & 18, and PROWAG	N/A	10 ft shared-use path (for shared-use path design criteria see **Exhibit 3.2.3.3-2**)

Exhibit 3.2.3.2-4
Critical Design Elements for Connector Roadways
(Southern Grant Street[2], Elmwood Avenue, & Delaware Avenue)

PIN:	5470.22	NHS (Y/N):	No
Route No. & Name:	Southern Grant Street[2], Elmwood Avenue, and Delaware Avenue Connectors	Functional Classification:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	2% to 5%	Terrain:	Rolling
ADT Two-Way (2040)	15,200 (max)	Truck Access/Qualifying Hwy.	No

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	30 mph HDM Section 2.7.2.2.A	N/A	30 mph
2	Lane Width	11 ft (min) 12 ft min./14 ft shared lane width desirable to accommodate bicyclists HDM Section 2.7.2.2.B & Exhibit 2-4.	N/A	Var. 11 ft 12 ft (Elmwood)[3,4] Var. 12 ft to 13 ft (Delaware)[3]
3	Turning Lane Width	11 ft (min) 12 ft (desirable) HDM Section 2.7.2.2.B & Exhibit 2-4	N/A	Var. 11 ft to 15 ft (Elmwood)[3] Var. 12 ft to 15 ft (Delaware)[3]
4	Bridge Roadway Width	Full Approach Roadway Width BM Section 2.3	N/A	Full Approach Roadway Width
5	Shoulder Width	A 0 ft to 4 ft shoulder may be used where a wide outside travel lane (12 ft min) or separate provisions (e.g. multi-use path) are provided. 5 ft (min) for bicycling, lateral offset, etc. 6 ft to 10 ft for breakdowns and turning movements. HDM Section 2.7.2.2.C & Exhibit 2-4	N/A	Var. 1 ft to 3 ft
6	Maximum Grade	9% HDM Section 2.7.2.2.E & Exhibit 2-4	N/A	4.0% (Elmwood) 5.0% (Delaware)
7	Horizontal Curvature (Minimum)	250 ft (@ e = 4.0%) HDM Section 2.7.2.2.F & Exhibit 2-4	N/A	295 ft (Elmwood) 196 ft* (Delaware)
8	Superelevation Rate (Maximum)	4% Maximum HDM Section 2.7.2.2.G	N/A	2.0% (max)
9	Stopping Sight Distance (Minimum)	200 ft (min) HDM Section 2.7.2.2.H & Exhibit 2-4	N/A	150 ft (min)* (Elmwood) 270 ft (min) Delaware
10	Horizontal Clearance (From Face of Curb)	0 ft with barrier 1.5 ft without barrier 3 ft at intersections HDM Section 2.7.2.2.I	N/A	1.5 ft, 3 ft at intersections
11	Vertical Clearance (Minimum)	15 ft (min) signs, 15.5 ft (desirable) signs, 15 -17 ft signals HDM Section 2.7.2.2.J, BM Section 2.4 & Table 2-2	N/A	15-17 ft signals
12	Travel Lane Cross Slope	1.5% (min) to 2% (max) HDM Section 2.7.2.2.K	N/A	2%
13	Rollover (Maximum)	4% between lanes; 8% at edge of traveled way HDM Section 2.7.2.2.L	N/A	4% between travel lanes
14	Structural Capacity (Highway Bridges)	HL-93 and NYSDOT Design Permit Vehicle New/Replacement BM Section 2.6	N/A	HL-93 and NYSDOT Design Permit Vehicle New/Replacement
15	Pedestrian Accommodation	5 ft minimum sidewalk HDM Section 2.7.2.2.N, HDM Chapter 18, and PROWAG	N/A	10 ft (min) Shared-use Path (for shared-use path design criteria see **Exhibit 3.2.3.3-2**)

Exhibit 3.2.3.2-4
Critical Design Elements for Connector Roadways
(Southern Grant Street[2], Elmwood Avenue, & Delaware Avenue)

PIN:	5470.22	NHS (Y/N):	No
Route No. & Name:	Southern Grant Street[2], Elmwood Avenue, and Delaware Avenue Connectors	Functional Classification:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	2% to 5%	Terrain:	Rolling
ADT Two-Way (2040)	15,200 (max)	Truck Access/Qualifying Hwy.	No

Element	Standard	Existing Condition	Proposed Condition

(1) * = non-standard feature
(2) Refer to roundabout design parameters in Section 3.2.3.3 regarding design controls for the southern Grant Street Connector. Given the limited distance between Grant Street and NYS Route 198, the geometry of that roadway would be controlled by the roundabout approach and departure design parameters.
(3) Travel and turning lane widths in excess of the minimum are required to accommodate design vehicles within the travel lane given the proposed curvature of the connector roadways.
(4) Bicycles may use the adjacent shared use path on the Elmwood Avenue Connector.

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Exhibit 3.2.3.2-5
Critical Design Elements for Grant Street

PIN:	5470.22	NHS (Y/N):	No
Route No. & Name:	Grant Street	Functional Classification:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	11%	Terrain:	Rolling
ADT Two-Way (2040)	13,500	Truck Access/Qualifying Hwy.	No

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	30 mph HDM Section 2.7.2.2.A	30 mph[2]	30 mph
2	Lane Width	11 ft (min) 12 ft min./14 ft shared lane width desirable to accommodate bicyclists HDM Section 2.7.2.2.B & Exhibit 2-4.	11 ft left, Var. 11 ft to 14 ft right	Var. 11 ft to 14 ft, left Var. 11 ft to 12 ft, right
3	Turning Lane Width	11 ft (min) 12 ft (desirable) HDM Section 2.7.2.2.B & Exhibit 2-4	Var. 11 ft to 13 ft	Var. 11 ft to 12 ft
4	Shoulder Width (Right, Curbed)	A 0 ft to 4 ft shoulder may be used where a wide outside travel lane (12 ft min) or separate provisions (e.g. multi-use path) are provided. 5 ft (min) for bicycling, lateral offset, etc. 6 ft to 10 ft for breakdowns and turning movements. HDM Section 2.7.2.2.C & Exhibit 2-4	0 ft	0 ft[3]
5	Maximum Grade	9% HDM Section 2.7.2.2.E & Exhibit 2-4	3.7%	3.7%
6	Horizontal Curvature (Minimum)	250 ft (@ e = 4.0%) HDM Section 2.7.2.2.F & Exhibit 2-4	574 ft	443 ft
7	Superelevation Rate (Maximum)	4% Maximum HDM Section 2.7.2.2.G	2%	2%
8	Stopping Sight Distance (Minimum)	200 ft (min) HDM Section 2.7.2.2.H & Exhibit 2-4	282 ft	285 ft
9	Horizontal Clearance (From Face of Curb)	0 ft with barrier 1.5 ft without barrier 3 ft at intersections HDM Section 2.7.2.2.I	Varies	1.5 ft, 3 ft at intersections
10	Vertical Clearance (Minimum)	15 ft (min) signs, 15.5 ft (desirable) signs, 15 -17 ft signals HDM Section 2.7.2.2.J, BM Section 2.4 & Table 2-2	15-17 ft signals	15-17 ft signals
11	Travel Lane Cross Slope	1.5% (min) to 2% (max) HDM Section 2.7.2.2.K	2.3%	2%
12	Rollover (Maximum)	4% between lanes; 8% at edge of traveled way HDM Section 2.7.2.2.L	4% between travel lanes	4% between travel lanes
13	Pedestrian Accommodation	5 ft minimum sidewalk HDM Section 2.7.2.2.N, HDM Chapter 18, and PROWAG	7 ft sidewalk adjacent to curb	5 ft sidewalk, 7 ft sidewalk adjacent to curb

(1) Work on intersecting arterials would be limited to the extent necessary to provide additional capacity at proposed intersections as needed and tie back into existing features. No planned work on Grant Street Bridge over NYS Route 198.
(2) City of Buffalo statutory speed limit is 30 mph.
(3) Lack of curb offset is consistent with the existing cross section of Grant Street. The scope of work on Grant Street is limited to approximately 850 ft for intersection capacity improvements and reconnection. Bicyclists would continue to be accommodated in the outside travel lanes which vary from 12 to 14 ft.

Exhibit 3.2.3.2-6
Critical Design Elements for Elmwood Avenue

PIN:	5470.22	NHS (Y/N):	Yes
Route No. & Name:	Elmwood Avenue	Functional Classification:	Urban Principal Arterial - Other
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	4%	Terrain:	Rolling
ADT Two-Way (2040)	31,200	Truck Access/Qualifying Hwy.	Access (North of NYS Route 198)

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	40 mph HDM Section 2.7.2.2.A	40 mph[2]	40 mph
2	Lane Width	11 ft (min) 12 ft min./14 ft shared lane width desirable to accommodate bicyclists HDM Section 2.7.2.2.B & Exhibit 2-4..	11 ft left 14 ft right	Varies 11 ft to 14 ft
3	Turning Lane Width	11 ft (min) 12 ft (desirable) HDM Section 2.7.2.2.B & Exhibit 2-4.	Var. 11 ft SB left turn 15 ft SB right turn	11 ft SB left turn 15 ft SB right turn
4	Shoulder Width (Right, Curbed)	A 0 ft to 4 ft shoulder may be used where a wide outside travel lane (12 ft min) or separate provisions (e.g. multi-use path) are provided. 5 ft (min) for bicycling, lateral offset, etc. 6 ft to 10 ft for breakdowns and turning movements. HDM Section 2.7.2.2.C & Exhibit 2-4.	0 ft	0 ft[3]
5	Maximum Grade	8% HDM Section 2.7.2.2.E & Exhibit 2-4.	1.0%	1.0%
6	Horizontal Curvature (Minimum)	533 ft (@ e = 4.0%) HDM Section 2.7.2.2.F & Exhibit 2-4.	Tangent Section	Tangent Section
7	Superelevation Rate (Maximum)	4% Maximum HDM Section 2.7.2.2.G	Normal Crown	Normal Crown
8	Stopping Sight Distance (Minimum)	305 ft (min) HDM Section 2.7.2.2.H & Exhibit 2-4.	> 305 ft	> 305 ft
9	Horizontal Clearance (From Face of Curb)	0 ft with barrier 1.5 ft without barrier 3 ft at intersections HDM Section 2.7.2.2.I	Varies	1.5 ft, 3 ft at intersections
10	Vertical Clearance (Minimum)	15 ft (min) signs, 15.5 ft (desirable) signs, 15 -17 ft signals HDM Section 2.7.2.2.J, BM Section 2.4 & Table 2-2	15-17 ft signals	15-17 ft signals
11	Travel Lane Cross Slope	1.5% (min) to 2% (max) HDM Section 2.7.2.2.K	2%	2%
12	Rollover (Maximum)	4% between lanes; 8% at edge of traveled way HDM Section 2.7.2.2.L	4% between travel lanes	4% between travel lanes
13	Pedestrian Accommodation	5 ft minimum sidewalk HDM Section 2.7.2.2.N, HDM Chapter 18, and PROWAG	5 ft sidewalk	5 ft sidewalk

(1) Work on intersecting arterials would be limited to the extent necessary to provide additional capacity at proposed intersections as needed and tie back into existing features.
(2) Based on speed measurements taken for PIN 5470.30
(3) Lack of curb offset is consistent with the existing cross section of Elmwood Avenue. The scope of work on Elmwood Avenue is limited to approximately 300 ft for intersection capacity improvements and reconnection. Bicyclists would continue to be accommodated in the outside travel lanes which are 14 ft wide.

Exhibit 3.2.3.2-7
Critical Design Elements for Delaware Avenue

PIN:	5470.22	NHS (Y/N):	Yes
Route No. & Name:	Delaware Avenue (NYS Route 384)	Functional Classification:	Urban Principal Arterial - Other
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	2%	Terrain:	Rolling
ADT Two-Way (2040)	31,500	Truck Access/Qualifying Hwy.	Access (North of NYS Route 198)

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	45 mph HDM Section 2.7.2.2.A	45 mph[6]	45 mph[6]
2	Lane Width	11 ft (min) 12 ft/14 ft shared lane width desirable to accommodate bicyclists HDM Section 2.7.2.2.B & Exhibit 2-4 .	Var. 11 ft to 12 ft	Var. 11 ft to 12 ft
3	Turning Lane Width	11 ft (min) 12 ft (desirable) HDM Section 2.7.2.2.B & Exhibit 2-4	11 ft	Var. 11 to 13 ft[3]
4	Shoulder Width (Left, Curbed)	0 ft (min) 1 - 2 ft desirable HDM Section 2.7.2.2.C & Exhibit 2-4	0 ft	0 ft
5	Shoulder Width (Right, Curbed)	A 0 ft to 4 ft shoulder may be used where a wide outside travel lane (12 ft min) or separate provisions (e.g. multi-use path) are provided. 5 ft (min) for bicycling, lateral offset, etc. 6 ft to 10 ft for breakdowns and turning movements. HDM Section 2.7.2.2.C & Exhibit 2-4	5 ft[4]	5 ft[4]
6	Maximum Grade	7% HDM Section 2.7.2.2.E & Exhibit 2-4	4.3%	4.6%
7	Horizontal Curvature (Minimum)	711 ft (@ e = 4.0%) HDM Section 2.7.2.2.F & Exhibit 2-4	427 ft*	450 ft*
8	Superelevation Rate (Maximum)	4% Maximum HDM Section 2.7.2.2.G	2%*	2%*
9	Stopping Sight Distance (Minimum)	360 ft (min) HDM Section 2.7.2.2.H & Exhibit 2-4	245 ft	245 ft*
10	Horizontal Clearance (From Face of Curb)	0 ft with barrier 1.5 ft without barrier 3 ft at intersections HDM Section 2.7.2.2.I	Varies	1.5 ft, 3 ft at intersections
11	Vertical Clearance (Minimum)	14.0 ft (min) vehicular bridge, 14.5 ft (desirable) vehicular bridge, 15 ft (min) signs, 15.5 ft (desirable) signs, 15 -17 ft signals HDM Section 2.7.2.2.J, BM Section 2.4 & Table 2-2	13 ft[5] @ NYS Route 198 overpass*	13 ft @ NYS Route 198 overpass*
12	Travel Lane Cross Slope	1.5% (min) to 2% (max) HDM Section 2.7.2.2.K	2%	2%
13	Rollover (Maximum)	4% between lanes; 8% at edge of traveled way HDM Section 2.7.2.2.L	4% / 8% max	4% / 8% max
14	Pedestrian Accommodation	5 ft minimum sidewalk HDM Section 2.7.2.2.N, HDM Chapter 18, and PROWAG	5 ft sidewalk	Var. 5 ft to 8 ft sidewalk

(1) * Non-Standard Feature
(2) Delaware Avenue (NYS Route 384) is an Access Highway north of NYS Route 198.
(3) Wider turn lane segment required to accommodate WB-20 (WB-67) vehicle.
(4) Existing shoulder used as bicycle lane.
(5) Delaware Avenue underpass currently posted at 12 ft - 3 in
(6) City of Buffalo statutory speed limit is 30 mph, however 45 mph design speed selected to remain consistent with D257325 of 1997

Exhibit 3.2.3.2-8
Critical Design Elements for Parkside Avenue & Agassiz Circle Access

PIN:	5470.22	NHS (Y/N):	No
Route No. & Name:	Parkside Avenue	Functional Classification:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification:	Urban Arterial
% Trucks:	4%	Terrain:	Rolling
ADT Two-Way (2040)	16,500	Truck Access/Qualifying Hwy.	No

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	30 mph HDM Section 2.7.2.2.A	30 mph[2]	30 mph
2	Lane Width	11 ft (min) 12 ft/14 ft shared lane width desirable to accommodate bicyclists 8 ft (min) parking lane HDM Section 2.7.2.2.B & Exhibit 2-4 .	10 ft*	Var. 11 ft to 12 ft 8 ft parking lane
3	Turning Lane Width	11 ft (min) 12 ft (desirable) HDM Section 2.7.2.2.B & Exhibit 2-4	11 ft	Var. 11 ft to 13 ft
4	Shoulder Width (Right, Curbed)	A 0 ft to 4 ft shoulder may be used where a wide outside travel lane (12 ft min) or separate provisions (e.g. multi-use path) are provided. 5 ft (min) for bicycling, lateral offset, etc. 6 ft to 10 ft for breakdowns and turning movements. HDM Section 2.7.2.2.C & Exhibit 2-4	0 ft	Var. 0 ft[3] 1 ft.
5	Maximum Grade	9% HDM Section 2.7.2.2.E & Exhibit 2-4	1.4%	2.75% Parkside 3.27% Agassiz Circle Access
6	Horizontal Curvature (Minimum)	250 ft (@ e = 4.0%) HDM Section 2.7.2.2.F & Exhibit 2-4	Tangent	Tangent
7	Superelevation Rate (Maximum)	4% Maximum HDM Section 2.7.2.2.G	Normal Crown	Normal Crown
8	Stopping Sight Distance (Minimum)	200 ft (min) HDM Section 2.7.2.2.H & Exhibit 2-4	> 200 ft	> 200 ft
9	Horizontal Clearance (From Face of Curb)	0 ft with barrier 1.5 ft without barrier 3 ft at intersections HDM Section 2.7.2.2.I	Varies	1.5 ft, 3 ft at intersections
10	Vertical Clearance (Minimum)	15 ft (min) signs, 15.5 ft (desirable) signs, 15 -17 ft signals HDM Section 2.7.2.2.J, BM Section 2.4 & Table 2-2	15-17 ft signals	15-17 ft signals
11	Travel Lane Cross Slope	1.5% (min) to 2% (max) HDM Section 2.7.2.2.K	1% to 3%	2%
12	Rollover (Maximum)	4% between lanes; 8% at edge of traveled way HDM Section 2.7.2.2.L	4% between travel lanes	4% between travel lanes
13	Pedestrian Accommodation	5 ft minimum sidewalk HDM Section 2.7.2.2.N, HDM Chapter 18, and PROWAG	5 ft sidewalk	5 ft sidewalk

(1) Work on intersecting arterials would be limited to the extent necessary to provide additional capacity at proposed intersections as needed and tie back into existing features.
(2) City of Buffalo statutory speed limit is 30 mph.
(3) Lack of curb offset is consistent with the existing cross section of Parkside Avenue and the Agassiz Circle Access. The scope of work on Parkside Avenue and the Agassiz Circle Access is limited to approximately 560 ft for intersection capacity improvements and reconnection.

Exhibit 3.2.3.2-9
Critical Design Elements for Local Urban Streets[1]
(Nottingham Terrace, Humboldt Parkway, and Agassiz Circle)

PIN:	5470.22	NHS (Y/N):	No
Route No. & Name:	Nottingham Terrace Iroquois Drive Humboldt Parkway Agassiz Circle	Functional Classification:	Local Urban Street
Project Type:	Reconstruction	Design Classification:	Local Urban Street
% Trucks:	<2%	Terrain:	Rolling
ADT Two-Way (2040)	9,400 9,000 500 500	Truck Access/Qualifying Hwy.	No

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	30 mph HDM Section M2.7.4.2.A	30 mph [2]	30 mph
2	Lane Width	10 ft (min) 11 ft desirable HDM Section 2.7.4.2.B & Exhibit 2-8	16 ft Nottingham Terr. 24 ft Humboldt Pkwy. 20 ft Agassiz Circle	12 ft Nottingham Terr. 20 ft Humboldt Parkway 20 ft Agassiz Circle
3	Turning Lane Width	9 ft (min) 10 ft desirable HDM Section 2.7.4.2.B & Exhibit 2-8	11 ft	11 ft
4	Shoulder Width (Right, Curbed)	A 0 ft to 4 ft shoulder may be used where a wide outside travel lane (12 ft min) or separate provisions (e.g. multi-use path) are provided. 5 ft (min) for bicycling, lateral offset, etc. 6 ft to 10 ft for breakdowns and turning movements. HDM Section M2.7.2.2.C & Exhibit 2-8	0 ft	0 ft
5	Maximum Grade	15% Residential 8% Commercial & Industrial HDM Section 2.7.4.2.E	3.0%	2.72% (max)
6	Horizontal Curvature (Minimum)	250 ft (@ e = 4.0%) HDM Section 2.7.4.2.F & Exhibit 2-8	Varies	Tangent Nottingham Terrace 216 ft Agassiz Circle* 70 ft Humboldt Parkway*
7	Superelevation Rate (Maximum)	4% Maximum HDM Section 2.7.4.2.G	Normal Crown	Normal Crown
8	Stopping Sight Distance (Minimum)	200 ft HDM Section 2.7.4.2.H & Exhibit 2-8	> 200 ft	> 200 ft
9	Horizontal Clearance (From Face of Curb)	0 ft with barrier 1.5 ft without barrier 3 ft at intersections HDM Section 2.7.4.2.I	Varies	1.5 ft 3 ft at intersections
10	Vertical Clearance (Minimum)	15 -17 ft signals HDM Section 2.7.4.2.J, BM Section 2.4 & Table 2-2	Var. 15 ft to 17 ft signals	Var.15 ft to 17 ft signals
12	Travel Lane Cross Slope	1.5% Min. to 2% Max. HDM Section 2.7.4.2.K	2% to 3%	1.5% min to 2% max
13	Rollover (Maximum)	4% between lanes; 8% at EOT; HDM Section M2.7.4.2.L	4% between travel lanes	4% between travel lanes
14	Pedestrian Accommodation	5 ft minimum sidewalk HDM Section 2.7.2.2.N, HDM Chapter 18, and PROWAG	5 ft sidewalk	5 ft sidewalk/footpath for shared-use path design criteria see **Exhibit 3.2.3.3-2**)

(1) Work on intersecting streets would be limited to the extent necessary to secure adequate capacity at proposed intersections and tie back into existing features.

Exhibit 3.2.3.2-9
Critical Design Elements for Local Urban Streets[1]
(Nottingham Terrace, Humboldt Parkway, and Agassiz Circle)

PIN:	5470.22	NHS (Y/N):	No
Route No. & Name:	Nottingham Terrace Iroquois Drive Humboldt Parkway Agassiz Circle	Functional Classification:	Local Urban Street
Project Type:	Reconstruction	Design Classification:	Local Urban Street
% Trucks:	<2%	Terrain:	Rolling
ADT Two-Way (2040)	9,400 9,000 500 500	Truck Access/Qualifying Hwy.	No

Element	Standard	Existing Condition	Proposed Condition

(2) The City of Buffalo statutory speed limit is 30 mph.
(3) Though Humboldt Parkway and Agassiz Circle are two lanes wide (24 ft, 20 ft, respectively) the existing pavement is not marked and it is used as one through travel lane with periodic on-street parking.
(4) Provide for one 12 ft through lane and one 8 ft parking lane on Humboldt Parkway and Agassiz Circle within the limits of work.
(5) * Non-Standard Feature

3.2.3.3. Other Design Parameters

In addition to the critical design elements described in **Section 3.2.3.2**, other design parameters established by the NYSDOT and AASHTO that are typically used to design roadway and bridge projects include guidelines for roundabouts, shared-use paths, vehicular Level of Service (LOS), design vehicles, rainfall amounts for drainage facilities, and others. **Exhibits 3.2.3.3-1** and **3.2.3.3-2** provide design parameters for roundabouts and shared-use paths, respectively.

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Exhibit 3.2.3.3-1
Design Parameters for Roundabouts

	Element	Design Parameter	Proposed Condition
1	Maximum Entry Speed	30 mph NYSDOT EI 00-021 3.1.2.a	30 mph
2	Maximum Circulating Speed	25 mph NYSDOT EI 00-021 3.1.2.a & NCHRP 672	15 mph
3	Maximum Entry Superelevation	5% NYSDOT EI 00-021 3.1.2.b	Normal Crown, 2%
4	Horizontal Clearance	3 ft (min) at intersections *HDM Section 2.7.2.2 C*	3 ft (min)
5	Effective Flare Length	65 ft minimum, 328 ft maximum 100 ft desirable NYSDOT EI 00-021 3.1.2.c	N/A (Flares on entry do not develop an extra lane)
6	Minimum Entry Lane Width	10 ft NYSDOT EI 00-021 3.1.2.d	12 ft
7	Maximum Entry Lane Width	14 ft to 18 ft typical 35 ft Single Lane Approach NCHRP 672 & NYSDOT EI 00-021 3.1.2.e	19 ft
8	Entry Radius	33 ft minimum, 328 ft maximum 65 ft desirable NYSDOT EI 00-021 3.1.2.f and NYSDOT Intersection Design Unit Guidance	100 ft
9	Entry Angle	20° minimum, 60° maximum 30° to 40° desirable NYSDOT EI 00-021 3.1.2.g	20°
10	Approach Alignment	Radial Acceptable, Offset Left Desirable NYSDOT Intersection Design Unit Guidance	Radial / Offset Left
11	Approach Stopping Sight Distance	152.7 ft @ 25 mph 197.8 ft @ 30 mph NCHRP 672 6.2.6 & 6.7.3.1	>152.7 ft on NYS Route 198 > 152.7 ft on Grant Street Connector
12	Intersection Sight Distance	183.5 ft @ 25 mph Conflicting Approach Speed 220.2 ft @ 30 mph Conflicting Approach Speed NCHRP 672 6.2.6 & 6.7.3.4	185 ft @ 25 mph 225 ft @ 30 mph
13	Inscribed Circle Diameter	50 ft minimum, 328 ft maximum 130 ft to 150 ft typ, single lane, WB-67 NYSDOT EI 00-021 3.1.2.k & NCHRP 672	154.4 ft
14	Circulating Roadway Cross Slope	0.5% minimum, 2.5% maximum NYSDOT EI 00-021 3.1.2.l	2%
15	Circulating Roadway Width	≥ Maximum Entry Width ≤ Maximum Entry Width x 1.2 Design Vehicle + 3 ft Horizontal Clearance NYSDOT EI 00-021 3.1.2.m	19 ft
16	Control of Access	No Access within 80 ft of Yield Line Desirable NYSDOT EI 00-021 3.1.2.n	None
17	Minimum Circulating Sight Distance	77.0 ft @ 15 mph NCHRP 672 6.3.7.1	77.0 ft minimum
18	Minimum Exit Radius	65 ft minimum, 328 ft to 394 ft typical 656 ft desirable NYSDOT EI 00-021 3.1.2.p and NYSDOT Intersection Design Unit Guidance	350 ft
19	Pedestrian Accommodation	Meet PROWAG NYSDOT EI 00-021 3.1.2.q, NYSDOT HDM Chapter 18, and PROWAG	No Pedestrian Crossings or Parallel Features
20	Design Vehicle	Largest Expected Vehicle NYSDOT EI 00-021 3.1.2.r	WB-67, Refer to Exhibit 3.2.3.3-3
21	Rollover	4% max Between Travel Lanes NYSDOT EI 00-021 3.1.2.s	4% max between travel lanes

Note: 1. Parameters cover the approaches and departures to/from the roundabout on the (southern) Grant Street Connector. Refer to **Exhibit 3.2.3.2-3.**

Exhibit 3.2.3.3-2
Design Parameters for Shared-Use Paths

	Element	Design Parameter	Proposed Condition
1	Width	10 ft (min) AASHTO[1] Page 5-3	10 ft typ, 7.8 ft on BIN 1047259*
2	Graded Area (Path Shoulder) and Horizontal Clearance to Objects	1 ft (min) to rails or fences 2 ft (min) at 1:6 3 ft to 5 ft desirable at 1:6 AASHTO[1] Page 5-5	2 ft or greater at 1:6 1 ft (min) to rails or fences where required
3	Vertical Clearance	10 ft (min) NYSDOT BM and AASHTO[1] Page 5-6	8 ft* at Grant Street Connector, 9.7* ft at Grant Street, else 10 ft
4	Separation from a roadway	5 ft (min) from a two-way shared-use path to the edge of pavement on a low-speed road without barrier AASHTO[1] Page 5-11	10 ft typical, 2 ft (min) with barrier
5	Design Speed	18 mph in relatively flat terrain AASHTO[1] Page 5-12)	18 mph
6	Minimum Horizontal Curvature	60 ft	60 ft, not including path and roadway intersection areas
7	Trail Cross Slope	1% (min0 to 2% (max) Assume 1.5% for Design PROWAG	1% (min) to 2% (max) 1.5% for design
8	Maximum Grade	5% AASHTO[1] Page 5-16, PROWAG	4.5% max
9	Stopping Sight Distance	140 ft (min) AASHTO[1] Pages 5-18 and 5-19	140 ft (min)
10	Bridge Width	12 ft (min) BM Section 2.3, Table 2-1	14 ft (rail to rail)
11	Horizontal Sight Distance	48 ft AASHTO[1] Page 5-24	48 ft
12	Crest Vertical Curve	238 ft AASHTO[1] Page 5-20	238 ft

Notes: * Non-Conforming Feature
1. 2012 AASHTO Guide for the Development of Bicycle Facilities.

Exhibit 3.2.3.3 -3
Other Design Parameters

	Element	Design Parameter	Proposed Condition
1	Vehicular Level of Service (for non – interstate projects)	LOS D desirable[1]	LOS D typical
2	Drainage Design Storm	Storm Drain Systems – 10 yr[2] Ditch Design Storm – 25 yr[3]	Storm Drain Systems – 10 yr[2] Ditch Design Storm – 25 yr[3]
3	Freeboard (BM 2.4.3)	2 ft for the 50 year design flood for new or replacement highway bridges	2 ft (min)[4], 1.33 ft at Elmwood Connector[5]

Notes:
1. LOS D is typically considered acceptable in urban locations such as the City of Buffalo during peak hours of traffic.
2. A 50-year frequency shall be used for design at locations where no overflow relief is available including a sag vertical curve connecting negative and positive grades and other locations such as underpasses, depressed roadways, etc.
3. Including lining material.
4. There are no published parameters for shared use path bridges. Refer to **Section 3.3.3.7** for additional information on the hydraulics of bridges as it applies to shared-use path structures.
5. Refer to Section 3.3.3.2 (2) c for additional information on proposed freeboard at the Elmwood Avenue Connector.

Vehicle turning paths were analyzed for all proposed intersections within the project limits. As noted in **Chapter 2**, NYS Route 198 is a Qualifying Highway and therefore must be designed to accommodate a full size tractor-trailer combination with a 53-foot trailer (WB-67). Proposed intersections would accommodate the design turning paths as indicated in **Exhibit 3.2.3.3-4**.

Exhibit 3.2.3.3-4
Design Vehicle

Roadway	Intersection/Location	Design Vehicle	Vehicle Accommodated
NYS Route 198	@ Roundabout	WB-67	WB-67
Southern Grant Street Connector to NYS Route 198	@ NYS Route 198	WB-67	WB-67
	@ Grant Street	WB-67	WB-67
	@ Buffalo State Drive	SU-30	SU-30[1]
Northern Grant Street Connector to NYS Route 198	@ NYS Route 198	WB-67	WB-67
	@ Grant Street	WB-67	WB-67
	@ Tops Driveway	WB-50	WB-50/SU-30[2]
Elmwood Avenue Connector	@ NYS Route 198	WB-67	WB-67
	@ Elmwood Avenue	WB-67[7]	WB-67[7], B-40+P[8]
	@ Nottingham Terrace	WB-50	WB-50/SU-30[3]
Southern Lincoln Parkway Connector	@ NYS Route 198	WB-67	WB-67
	@ Iroquois Drive	WB-67	WB-67
Northern Lincoln Parkway Connector	@ NYS Route 198 [4]	SU-30	SU-30
	@ Nottingham Terrace[4]	SU-30	SU-30
Delaware Avenue	@ Nottingham Terrace	See Note 5	See Note 5
Delaware Avenue Connector	@ NYS Route 198	WB-67	WB-67
	@ Delaware Avenue	WB-67	WB-67
Delaware Park Parking Lot Exit & Entrance Driveways	@ NYS Route 198	SU-30	SU-30
	@ Parkside Avenue	SU-30	SU-30
NYS Route 198	@ Parkside Avenue (north leg)	WB-67	WB-67
	@ Parkside Avenue (south leg)	WB-50[9], WB-67	WB-67

Notes:
1. Movements accommodated to and from the Buffalo State College approach match existing.
2. Movements to and from the Tops Plaza approach match existing. Southbound right accommodates SU.
3. Elmwood Avenue northbound right to Nottingham Terrace currently accommodates an SU. Proposed condition would match existing.
4. Roadway to be signed for no trucks. Trucks accommodated at Delaware Avenue and Elmwood Avenue Connectors.
5. Build Alternative would retain all existing design vehicle turning movements at this location.
6. Design vehicle movements at NYS Route 198 only. Not representative of intersection at Agassiz Circle.
7. Eastbound vehicles on Ramp ED currently can only turn right. No vehicles can make a left turn.
8. WB-67 vehicle will be accommodated for all movements; however when completing the eastbound to northbound move it will require both lanes on Elmwood Avenue to complete the turn (i.e. trucks and passenger cars would not be able to complete a turn in parallel at the same time). The largest vehicle that could complete the eastbound to northbound left turn in parallel with a passenger car would be a city bus.
9. A WB-50 can make the eastbound right turn from NYS Route 198 eastbound to Parkside Avenue southbound. This is an incremental improvement over existing conditions which can accommodate a WB-40.

The NYSDOT HDM (Chapter 25) defines traffic calming as “the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.” Under the Build Alternative, NYS Route 198 would be considered a Category III facility. That category includes some parkways, urban or suburban arterials and collectors, and some higher speed urban streets. Design speeds for Category III facilities are in the range of 35 miles per hour to 50 miles per hour. Traffic calming features that would be incorporated into the Build Alternative to help moderate operating speeds are summarized in **Exhibit 3.2.3.3-5.**

Exhibit 3.2.3.3-5 Traffic Calming Features
Pedestrian Refuge/Midblock Islands
Gateways[1]
Landscape Development
Sidewalks[2,]
Narrow Travel Lanes and Shoulders
Street Furniture and Lighting
Surface Textures[4]
Arterial Improvements
Bike Facilities[5]
Median Treatments
Higher Visibility Crosswalks[4]
Signing[6]
Progressive Traffic Signal Systems
Regulations/Enforcement
Walk Phase on Signal
Single/Multi-Lane Roundabout[7]
Raised Crosswalks and Intersections[8]

Notes:
1. Possible locations for gateway features include Grant Street (eastbound) and Parkside Avenue (westbound)
2. Sidewalks may also include shared-use paths and footpaths under the Build Alternative
3. The Build Alternative includes 1 ft curb offsets along the median side.
4. Consideration to the use of colored, textured crosswalks or corner areas would be given during detailed design. Coloring and texturing could also be used in two-tier median areas.
5. Bicycle route, shared-use path connections and crossings
6. Expressway-style signing would be removed
7. At the intersection of NYS Route 198 and the (southern) Grant Street Connector
8. Non-Conforming Feature Per NYSDOT *Highway Design Manual* Chapter 25, Refer to **Section 3.3.3.2 (2)**.

3.3. Engineering Considerations

3.3.1. Operations (Traffic and Safety) & Maintenance

3.3.1.1. Functional Classification and National Highway System

Upon completion of the project, the NYSDOT would pursue changing the functional classification of NYS Route 198 from an “Urban Principal Arterial Expressway” to an “Urban Minor Arterial”. The revised classification would be appropriate for a non-freeway facility in an urban area with a 30 mile per hour posted speed limit and surrounded by a large number of adjacent pedestrian generators and destinations. The project would not change the functional classification of any abutting or intersecting roadways within the project limits as presented in **Section 2.3.1.1**.

3.3.1.2. Control of Access

It is anticipated that proposed highway boundaries along NYS Route 198 would be classified as “with access”. NYS Route 198 would remain accessible from the following facilities:

- Grant Street
- Elmwood Avenue
- Iroquois Drive and Lincoln Parkway (access to eastbound NYS Route 198 only)
- Nottingham Terrace and Lincoln Parkway (access to westbound NYS Route 198 only)
- Delaware Avenue
- Parkside Avenue

Direct driveway access to the City of Buffalo Police radio tower and City of Buffalo Park Maintenance Facility would also be retained. A new exit would be constructed from the Delaware Park parking area to NYS Route 198 westbound. This feature, combined with the entrance from Parkside Avenue, would mimic the

original shape of Agassiz Circle. Refer to **Section 3.3.3.1 (6) (f)** for more information on proposed driveway improvements.

3.3.1.3. Traffic Control Devices

Proposed changes to intersection traffic control are summarized in **Exhibit 3.3.1.3**. All new traffic control devices would be consistent with NYSDOT standards, the MUTCD, and the New York State Supplement in effect at the time of final design.

Exhibit 3.3.1.3
Intersection Traffic Control Changes

Location	Traffic Control
NYS Route 198 at the Southern Grant Street Connector	New roundabout
NYS Route 198 at the Northern Grant Street Connector	New signal
NYS Route 198 at the Buffalo State College Crossing	New signal
NYS Route 198 at the Elmwood Connector	New signal
NYS Route 198 at the Southern Lincoln Parkway Connector	New signal (right turn only)
NYS Route 198 at the Northern Lincoln Parkway Connector	Stop sign (right turn only)
NYS Route 198 at the Hoyt Lake Crossing	New signal
NYS Route 198 at the Delaware Avenue Connector	New signal
NYS Route 198 at the Buffalo Parks Facility Driveway	New signal
NYS Route 198 at Parkside Avenue	Replacement signal
Southern Grant Street at the Connector and Buffalo State College	Replacement signal
Northern Grant Street at the Connector and Tops Plaza	Replacement signal
Grant Street at Amherst Street	Replacement signal [1]
Elmwood Avenue at the Elmwood Connector and Nottingham Terrace	Replacement signal
Iroquois Drive and Lincoln Parkway at Southern Lincoln Parkway Connector	New stop signs northbound and eastbound
Delaware Avenue at the Delaware Avenue Connector	New signal
Delaware Avenue at Nottingham Terrace	Replacement signal [1]
Nottingham Terrace at Amherst Street	Add PM peak left turn restriction
Delaware Avenue at Delevan Avenue	Prohibit southbound left turn to cemetery entrance, add westbound right turn arrow
Delaware Avenue at the Forest Lawn Cemetery Crossing	New signal

Note 1: Signal replacement required for NYSDOT to assume ownership and provide interconnection. Assume a maintenance agreement with the City of Buffalo.

NYS Route 198 and the Southern Grant Street connector would intersect at a roundabout as illustrated on **Exhibit 1.3-1**. The eastbound approach would consist of two through lanes and a separate bypass for right turns. All three lanes would be controlled by yield signs. The northbound approach would consist of one lane for left turns and one lane for right turns, both controlled by a yield sign. The westbound approach would consist of one lane shared by left turns and through movements and a separate bypass lane. The shared lane would yield to circulating traffic while the bypass lane would operate under free-flow conditions. Three-quarters of the roundabout would have a single circulatory lane. The remaining segment would have two lanes available for eastbound through movements. No pedestrian crossings are proposed at the roundabout.

Roundabouts were also considered as an option for intersection control at the following locations:

- NYS Route 198 at the Elmwood Avenue Connector
- NYS Route 198 at the Delaware Avenue Connector
- NYS Route 198 and the Parkside Avenue Intersection

Roundabouts at these locations would require multiple lanes, including bypass lanes, to handle the anticipated volume of vehicular traffic. A roundabout with three circulating lanes would not have adequate capacity to handle the anticipated vehicular traffic demand at the Parkside Avenue intersection. Multi-lane roundabouts would result in long, multi-part pedestrian crossings. Future accessibility guidelines may

require multi-lane pedestrian crossings at roundabouts to be signalized. In addition, each roundabout would require the acquisition of more parkland than a signalized intersection. Roundabouts were dismissed from further consideration in favor of signalized intersections based on a desire to limit parkland impacts and public concerns regarding pedestrian safety at multi-lane roundabouts in Delaware Park.

3.3.1.3. (1) Traffic Signals

New and modified three-color traffic signal equipment would incorporate vehicle detection and coordination. Pedestrian detection and signalization would also be included. In addition to intersection corners and the ends of crosswalks, pedestrian push button stations and signals would be located within intersection median refuge islands to serve pedestrians who may be unable to fully cross the roadway during one signal phase.

The signal system along NYS Route 198 would be operated as an actuated-coordinated system during the peak hours of traffic and could be operated as a pre-timed, coordinated network during off-peak periods to encourage vehicular speeds compatible with the 30 mile per hour posted speed limit. Time-space diagrams illustrating signal progression are included in **Appendix C2**, **Exhibit 3.3.1.3 (1)-1** through **Exhibit 3.3.1.3 (1)-4**. Although several feasible methods of interconnection will be evaluated during final design (e.g. time-based, hardwire, and wireless) and applied where appropriate, it is anticipated that the signals along NYS Route 198 would be interconnected via hardwire to ensure reliability and the accuracy of the system. An Arterial Management Agreement would be developed by the NYSDOT, in collaboration with the City of Buffalo, for approval by the FHWA prior to the completion of final design. The purpose of that document would be to describe the characteristics of the proposed system from the viewpoint of various stakeholders including operators, users, owners, developers, maintenance personnel, and management.

For the purposes of analysis (Refer to **Section 3.3.1.7**) the NYS Route 198 and Delaware Avenue Connector intersection was assumed to have the master controller for the interconnected traffic signal system. This is primarily because it is anticipated that the Parkside Avenue intersection would operate in an uncoordinated manner during peak traffic periods. The selection of a master intersection would be finalized during final design. In the future, as part of a separate action, the signals could also be connected to the Traffic Management Center to allow for real-time monitoring and adjustments.

The placement of the proposed pedestrian signals along NYS Route 198 would result in a signal spacing of approximately 900 to 1,300 feet. The signals and their placement would be warranted based on vehicular volumes, anticipated pedestrian volumes, the need to provide a coordinated traffic signal system (refer to Warrant 6B of Section 4C-07 of the National MUTCD), and the proposed roadway network.

The capacity analysis (Refer to **Section 3.3.1.7**) suggests that the coordination of additional signals, including those at and adjacent to the location where connector roadways would meet local streets including Grant Street, Elmwood Avenue, and Delaware Avenue, would benefit peak hour traffic operations. The NYSDOT would coordinate with the City of Buffalo during final design regarding applicable coordination plans, changes to ownership and maintenance jurisdiction (Refer to **Section 3.3.1.12**), and the development of agreements, if and where required, between the two agencies to realize these benefits.

3.3.1.3. (2) Signs

Existing overhead and other expressway-style signs within the project limits would be removed and replaced with ground mounted signs more appropriate for an urban arterial environment. Overhead signing would include lane use and street name applications, primarily at signalized intersections and crossings. New signing would be installed for all new roadway, intersection, and crossing configurations. A corridor-wide approach to signing would be explored during final design to promote consistency and aesthetics.

The legend on existing guide signs on I-190 and NYS Route 33 reading “Scajaquada Expressway” would be covered, replacing that designation with a new name (to be determined) that reflects the roadway’s change to an urban boulevard.

3.3.1.3. (3) Pavement Markings

New pavement makings would be installed on all reconstructed and resurfaced roadways. High-visibility treatments would be incorporated at pedestrian crossings. Both yellow (left side) and white (right side) edge lines would be included on NYS Route 198. Other typical pavement marking features would include hatching and lane-use arrows.

3.3.1.4. Intelligent Transportation Systems (ITS)

Existing ITS elements within the project limits would be replaced where impacted by the proposed improvements. This includes portions of the fiber optic backbone, distribution feeds to Buffalo State College, adjacent closed-circuit television (CCTV) cameras, and the City of Buffalo Police Radio Tower. Portions of the fiber optic backbone not currently located within NYSDOT right-of-way would be relocated or covered by new property acquisitions. Existing CCTV camera stations at Grant Street, near the proposed Elmwood Avenue Connector, at Elmwood Avenue, at the existing pedestrian bridge, and at Delaware Avenue would remain. The existing CCTV camera at Parkside Avenue would be replaced. The existing dynamic message sign would remain. Continuous count stations (loops) on NYS Route 198 and its existing ramps would be removed as their function would be relocated to loops at signalized intersections. Additional investigation would be required during final design to fully quantify the impacts.

Exhibit 3.3.1.4 summarizes the anticipated impacts to the Scajaquada Expressway Fiber Optic Backbone. No new ITS elements are proposed.

Exhibit 3.3.1.4
Location of Potential ITS Backbone Impacts

Owner	Type (OH/UG)[1]	Location	Impact
NYSDOT	Fiber Optic (UG)	NYS Route 198 at roundabout (Approx. Sta. EB 13+40 to ML 13+60 RT.)	Jack/bore conduit to lower backbone to avoid conflict with the proposed roundabout
NYSDOT	Fiber Optic (UG)	Crossing Southern Lincoln Parkway Connector (Approx. Sta. LS 13+00, LT. to LS 15+50, RT.)	Relocate backbone to within NYSDOT right-of-way by jacking/boring under creek and proposed connector roadway
NYSDOT	Fiber Optic (UG)	NYS Route 198 EB – East of ex. Pedestrian bridge (Approx. Sta ML 66+00 to ML 74+00, RT)	Relocate pullboxes and conduit outside realigned EB pavement. New backbone installation along south side of NYS Route 198
NYSDOT	Fiber Optic (UG)	Delaware Avenue to Parkside Avenue (Approx. Sta ML 79+00 to EB 212+00)	Install new backbone, pullboxes, and conduit along the south side of NYS Route 198

Notes:
1. OH = overhead, UG = Underground

3.3.1.5. Speeds and Delay

3.3.1.5. (1) Proposed Speed Limit

The existing posted speed limit of 30 miles per hour would be retained along NYS Route 198 within the project limits upon completion of the project. As shown in **Exhibit 2.3.1.5 (2)**, existing 85th percentile speeds are nearly 40 miles per hour. NYSDOT Engineering Instruction (EI) EI 13-018 states that based on the FHWA publication “Engineering Countermeasures for Reducing Speeds”, raised crosswalks have been found to reduce operating speeds 14% to 24%. It is anticipated that raised crosswalks and other traffic calming features incorporated into the Build Alternative (Refer to **Exhibit 3.2.3.2-5**) would achieve this

effect, therefore reducing the 85th percentile operating speeds to the range of 30 to 34 miles per hour, which is more compatible with the 30 mile per hour posted speed limit and beneficial to survivability in the event of a collision involving a pedestrian or bicycle.

Existing speed limits on adjacent and intersecting roadways would also remain unchanged. The need for advisory speed postings on connector roadways and on approaches to the proposed roundabout would be determined during final design.

3.3.1.5. (2) Travel Time Estimates

As noted in **Section 2.3.1.5 (3)**, a trip along NYS Route 198 from I-190 to NYS Route 33 currently takes approximately seven minutes. Travel time estimates for the Build Alternative in the design year (2040) were developed using Vissim (Version 5.4). The results are presented in **Exhibit 3.3.1.5 (2)**.

Exhibit 3.3.1.5 (2)
Build Alternative Corridor Peak Hour Travel Time Comparison

NYS Route 198 (I-190 to NYS Route 33)	AM Travel Time (min:sec)		PM Travel Time (min:sec)	
	Eastbound	Westbound	Eastbound	Westbound
Existing Field Measured (2015-2016)	7:15	6:31	6:57	6:45
Existing Modeled (Vissim) (2016)	7:17	6:53	6:18	6.34
No-Build Modeled (Vissim) (2040)	8:04	7:47	6:21	8:25
Build Alternative Modeled (Vissim) (2040)	9:28	8:46	8:42	8:56

As shown, it is anticipated that the Build Alternative would increase vehicular travel times along NYS Route 198 by just over two minutes during peak periods of commuter traffic. The increase in travel time would result from delays associated with the introduction of a roundabout, four new signalized intersections (including NYS Route 198 at the Southern Lincoln Parkway Connector), and three new mid-block pedestrian crossing signals,

3.3.1.6. Traffic Volumes

The Build Alternative would introduce one new roundabout and eight signals (intersections and pedestrian crossings) on NYS Route 198 between the Grant Street interchange and Parkside Avenue. The signalized intersection at Parkside Avenue would also be retained. These changes in traffic control, along with geometric adjustments and traffic calming features, would add an average of two minutes of delay to a trip along the Scajaquada Corridor. As a result, some drivers may consider using an alternate route to complete their trip. The GBNRTC, in cooperation with the NYSDOT, performed studies to assess the expected magnitude of diversion (away from NYS Route 198) that would be induced after completion of the project. That exercise also allowed for the evaluation of the impacts, if any, the proposed project would have on the alternate routes that may receive diverted traffic.

To evaluate the potential traffic impacts of the Build Alternative, the GBNRTC used its regional planning-level model of the greater project corridor to predict diversions of traffic to other routes. A Trans CAD microsimulation was used to validate the delays and route switches predicted by the planning-level model**.** When excessive delay or queuing was observed in the microsimulation model, nodal delay adjustments were made to the regional model. Output from the revised regional model was then run through the microsimulation model and checked again. This iterative process was used to arrive at predictions of diversion

Modeling was completed prior to the posted speed limit change in May 2015 and used the 50 mile per hour posted speed limit as its baseline. The results predicted that a combination of lowering the posted speed limit to 30 miles per hour and other improvements associated with the Build Alternative would result in the diversion of between 20% and 30% of traffic along NYS Route 198 to alternate routes. Traffic counts taken before and after the change to 30 miles per hour were compared and showed that between 15% and 25% of traffic had found an alternate route given the change in posted speed limit. Therefore, it was estimated that an additional 5% diversion would occur along NYS Route 198 as a result of the Build Alternative.

With two travel lanes in each direction, NYS Route 198 is expected to remain a viable choice for both through trips and trips with origins and/or destinations in the adjacent neighborhoods despite the addition of signals, raised crossings, and other traffic calming features. The 5% estimate of additional diversion is consistent with GBNRTC's modeling results. As documented in **Section 3.3.1.7**, intersections along NYS Route 198, with the exception of Parkside Avenue (as is the case today), are anticipated to operate acceptably during both the morning and evening peak periods. As described in **Section 2.3.1.5 (3)** and **Section 3.3.1.5 (2),** a peak hour trip along NYS Route 198 under the Build Alternative is expected to take between 6 and 7 minutes while a trip along an adjacent alternate route (local street) typically takes twice as long depending on the route. The alternate routes would continue to have less travel time reliability than NYS Route 198 given the presence of school buses, trash pick-up, local deliveries, driveways, parking activity, pedestrian activity, bicyclist interaction, and limited passing opportunities. The estimate of 5% diversion also recognizes the possibility that some vehicular traffic may return to the NYS Route 198 corridor once access, safety, and speeding issues have been resolved by the Build Alternative. Together these results support the choice of a 5% diversion estimate.

The Build Alternative volumes account for the estimated 5% diversion and changes in geometry and traffic control. The additional 5% diversion was distributed to the adjacent street network in a pattern consistent with previous diversion estimates made using the GBNRTC modeling. **Exhibit 3.3.1.6-1** summarizes projections of average annual daily traffic (AADT) for the Build Alternative. **Exhibit 3.3.1.6 -2** in **Appendix C1** directly compares the projected AADT under the no-build and build conditions.

Exhibit 3.3.1.6 -1
Future Build Daily Traffic Volumes

NYS Route 198 Segment	Direction	2020 AADT (vpd)	2030 AADT (vpd)	2040 AADT (vpd)
West of Grant Street	Eastbound	16,400	16,900	17,300
	Westbound	15,800	16,300	16,700
	Both Directions	32,200	33,200	34,000
Grant Street to Elmwood Avenue	Eastbound	15,200	15,600	16,000
	Westbound	14,700	15,100	15,500
	Both Directions	29,900	30,700	31,500
Lincoln Parkway to Delaware Avenue	Eastbound	18,500	18,900	19,400
	Westbound	13,700	14,100	14,400
	Both Directions	32,200	33,000	33,800
Delaware Avenue to Parkside Avenue	Eastbound	21,100	21,600	22,100
	Westbound	16,300	16,700	17,100
	Both Directions	37,400	38,300	39,200

Diagrams showing the year 2020, 2030, and 2040 morning and evening peak hour turning movement volumes along NYS Route 198 and at the diversion area intersections under the Build Alternative are available in **Appendix C1** as **Exhibits 3.3.1.6 -3** through **3.3.1.6-11**.

It is anticipated that school buses, transit buses, tractor-trailer combinations, and other large vehicles would continue to use NYS Route 198 upon project completion. Peak hour heavy vehicle percentages may increase slightly, but not substantially enough to result in a measureable change.

3.3.1.7. Level of Service and Mobility

Level of Service (LOS) analyses for the vehicular mode of travel at intersections along NYS Route 198 under the Build Alternative were completed using Vissim (Version 5.4). Future traffic signal phasing, timing, coordination, and pedestrian accommodation were all given consideration as part of the analysis. Refinements were made to the analysis based on comments received from the FHWA subsequent to the publication of the DDR/DEIS. **Exhibit 2.3.1.7 (1)-1 in Appendix C2** can be used to determine the effect of the Build Alternative on any study intersection by comparing the projected delay and LOS under both No-Build and Build Alternative conditions.

Queuing measurements were developed for the Build Alternative during the morning and evening peak hours using the Vissim microsimulation. The results from a series of multiple runs with different random number seeds were compiled to account for variability within the model. Average and maximum queue data were averaged across the multiple runs. The results are tabulated in **Exhibit 2.3.1.7 (1)-3** in **Appendix C2**.

Pedestrian volumes and crossings were included in the Build Alternative analyses. The Vissim models include a reasonable amount of anticipated pedestrian activity. Specific pedestrian information related to the proposed intersections along NYS Route 198 include:

- Buffalo State Crossing - The Build Alternative models include 17 pedestrian calls per hour with 10 seconds of walk and 19 seconds of flashing don't walk to accommodate pedestrian crossings.

- Elmwood Avenue Connector – The proposed green times would be sufficient to accommodate substantial pedestrian demand. For example, the Elmwood Avenue Connector was modeled with 41 seconds of green time for vehicular traffic turning onto NYS Route 198. This would apply to the crossing on the east leg of NYS Route 198. That crossing would also incorporate a 24-foot-wide median refuge.

- Lincoln Parkway Intersection – The pedestrian crossing of NYS Route 198 would sit just west of Lincoln Parkway. This location was modeled using 75 calls per hour (even though there would be only 33 cycles per hour based on the proposed 110 second cycle length) with seven seconds of walk and 20 seconds of flashing don't walk to accommodate the pedestrian crossings. Pedestrians crossing Lincoln Parkway were modeled to have seven seconds of walk and seven seconds of flashing don't walk to make the single-lane crossing. In reality, pedestrians would have much longer to cross this leg as the walk and flashing don't walk phases would run concurrently with the longer NYS Route 198 phases.

- Hoyt Lake Crossing – The Build Alternative models incorporate 17 pedestrian calls per hour with 10 seconds of walk and 19 seconds of flashing don't walk to accommodate the pedestrian crossings.

- Delaware Avenue Connector Intersection – The proposed green times would be sufficient to accommodate a substantial pedestrian demand. The Delaware Avenue Connector was modeled with 28 seconds of green time for vehicular traffic moving onto NYS Route 198. This would allow pedestrians to safely cross NYS Route 198. In addition, this crossing would have a 24-foot wide median refuge. For pedestrians crossing the Delaware connector, the corresponding green time would be 47 seconds eastbound and 82 seconds westbound. Both green times would be much longer than needed for pedestrian clearance.

- Buffalo Parks Maintenance Facility Intersection – The Build Alternative models incorporate six pedestrian calls per hour with seven seconds of walk and 19 seconds of flashing don't walk to accommodate the pedestrian crossings. In addition, the crossing would feature a 17-foot-wide median refuge.

- Parkside Avenue Intersection – This intersection was modeled with 30 pedestrians in each direction per crossing, except for the crossing of the east leg which would have 10. The intersection was modeled with a 130 second cycle length during the evening peak and a 145 second cycle length during the morning peak. Green times would be sufficient for pedestrians to clear the intersection as each primary phase would have approximately 40 seconds of through green time. In addition, eastern and western legs of the intersection would have a 10-foot-wide pedestrian refuge.

The Build Alternative modeling is included in the NYSDOT project file and can be made available upon request.

3.3.1.7 (1) At Project Completion & Design Year

In general, traffic operations along the NYS Route 198 corridor are projected to be acceptable for an urban boulevard under peak traffic conditions. All signalized intersections are anticipated to operate at LOS D or better overall proposed roundabout is expected to operate at LOS A overall. The analysis also shows that maximum queues would typically not block upstream intersections or interchanges. Average eastbound queues at the proposed roundabout would not reach I-190. Average westbound queues at Parkside Avenue would not reach NYS Route 33. Specific conditions of note are as follows:

- The eastbound dual left turn lanes approaching the Elmwood Avenue Connector on NYS Route 198 would operate at LOS E with just under 60 seconds of delay per vehicle during the morning peak hour in 2020 and 2040. This condition would result from the relatively long cycle length at the intersection and a phasing plan designed to avoid conflicts between crossing pedestrians and motor vehicles which would force left turning vehicles to wait between protected phases. By 2040, the projected maximum queue on the Elmwood Connector approach to NYS Route 198 would occupy all available storage leading up to Elmwood Avenue during the morning peak hour. This is likely to occur only during one or two signal cycles, as the average queue suggests just under 375 feet of clear distance between the average queue and the upstream intersection. While queuing on NYS Route 198 is anticipated to be substantial during the morning and evening peaks, it would not extend beyond one-half of the way to the next upstream intersection.

- The stop-controlled entrance to NYS Route 198 westbound from the northern Lincoln Parkway Connector is projected to operate at LOS D with just under 30 seconds of delay per vehicle by the year 2040. Motor vehicle volumes on NYS Route 198 westbound and queues emanating from the pedestrian signal just to the west at the southern Lincoln Parkway Connector are projected to result in some congestion, particularly during the morning peak. This condition would typically result in queues of two to three vehicles. Maximum queues are not expected to extend as far back as Nottingham Terrace. The adjacent intersection would remain an all-way stop; therefore, vehicles would be able to see and approach the end of a queue at relatively low speeds. Vehicles in queue would need to yield to pedestrians and bicycles in the raised crosswalk. Closure of the access or signalization would be needed to eliminate the anticipated conditions. Closure of the access would force additional vehicles to travel along the residential Nottingham Terrace and would cause further delays at the Elmwood Avenue and Nottingham Terrace intersection. Public comments received were not wholly in favor of its closure. A signal would not be warranted at this location.

- The left turn lane and the lane shared by through movements and right turns on the westbound Nottingham Terrace approach to Delaware avenue are each projected to operate at LOS E with approximately 60 seconds per vehicle of delay by the year 2040 during the morning peak. This change, resulting from the removal of traffic from the opposite leg of the intersection, represents an incremental improvement over the LOS F (100 to 120 second per vehicle) conditions projected under the no-build alternative. In addition, the average queue is projected to be cut in half, dropping from just under 650 feet in the no-build condition to just under 300 feet in the build condition.

- Peak hour delays at the Parkside Avenue intersection are expected to continue under the future build scenario through the year 2040. The overall (intersection) level of service is expected to improve slightly from LOS E to LOS D during each peak period. The eastbound and westbound approaches would continue to have vehicular lanes functioning at LOS E or F, although these delays would also be slightly reduced under the build alternative. Elimination of the westbound to northbound turning roadway (slip lane) coupled with changes to the curb line where vehicles can access westbound NYS Route 198 from Humboldt Parkway would improve vehicular operations by eliminating a weave. Maximum queues would be on the order of 1,300 feet and would reach the NYS Route 33 interchange. The platooning of vehicles on NYS Route 198 eastbound as a result of other upstream signals is also anticipated to have a positive effect on queuing and delay on the eastbound approach. Only during the morning peak would the maximum queue have the potential to extend past the proposed signal at the City of Buffalo Parks Maintenance Facility (approximately 1,200 feet). Southbound queues on Parkside Avenue during the morning peak would continue to extend past Robie Street (approximately 675 feet). Grade separation or otherwise expanding the

footprint of the NYS Route 198 and Parkside Avenue intersection would be needed to improve the LOS, which is beyond the scope of this project, is inconsistent with the project purpose and objectives, and would add substantial additional cost to the project given the presence of rock below the surface.

Based on capacity analyses of local intersections within the diversion area as summarized in **Exhibit 2.3.1.7 (1)-1**, the adjacent street network is anticipated to have adequate capacity to absorb 5% more diversion of traffic away from NYS Route 198 under the Build Alternative since nearly all intersections and/or critical movements are projected to continue to operate at LOS D or better. The following off-corridor improvements would be needed to ensure that peak hour operations become no worse than the no-build conditions at two specific intersections:

- The addition of an evening peak hour northbound left turn restriction at the intersection of Nottingham Terrace and Amherst Street, similar to the morning peak hour restriction already in place, would ensure that delays on that approach do not exceed those that that would be experienced without changes along NYS Route 198. The new restriction would affect less than five vehicles during the peak hour.

- The addition of an overlapping westbound right turn phase (arrow) on the Delevan Avenue approach to Delaware Avenue during the evening peak hour would eliminate delays anticipated at this location under both the no-build and build scenarios. It would be advisable to prohibit the southbound left turn into the Forest Lawn Cemetery in conjunction with this change for safety reasons. Access to Forest Lawn Cemetery would remain available from all other approaches to this five-legged intersection.

3.3.1.7 (2) At ETC+30 – Near New and Replacement Bridges

An analysis was completed using the projected traffic demand 30 years from the estimated time of completion to determine if roadways on (or under) new and/or replacement bridges would have sufficient capacity under the Build Alternative. There are two proposed bridge replacements in the project: on the proposed (northern) Grant Street Connector and Elmwood Avenue Connector. Both bridges would cross Scajaquada Creek. Turning movement diagrams showing the morning and evening peak hour turning movement volumes adjacent to these bridges are shown on **Exhibits 3.3.1.7 (2)-1** and **3.3.1.7 (2)-2** in **Appendix C1**. **Exhibit 3.3.1.7 (2)-3**, also in **Appendix C1**, summarizes the results of the capacity analysis. The conclusion is that additional lanes would not be needed on either of the proposed structures to accommodate projected changes in traffic between the years 2040 and 2050.

3.3.1.7 (3) Multimodal Analysis

Proposed pedestrian and bicycle changes were analyzed to assess their effectiveness. Performance measures described in the Federal Highway Administration Guidebook for Developing Pedestrian & Bicycle Performance Measures (FHWA Guidebook) were used, as well as methods of the Highway Capacity Manual 2010 (HCM2010). Applicable performance measures include route directness, crossing opportunities, and level of service. Refer to **Section 3.3.2.1** and **Section 3.3.2.2.** for detailed information on proposed pedestrian and bicycle facilities, respectively.

A. Route Directness

This is a measurement of the most direct routes for walking and biking between two designated locations. It is calculated as the ratio of the shortest physical path to the straight-line distance from an origin to a destination. Lower results, closer to a ratio of 1.0, indicate connected networks requiring little out-of-direction travel. A number of origin and destination pairs were selected to illustrate travel across and along the Scajaquada Corridor, both to and from representative pedestrian and bicycle generators. **Exhibit 3.3.1.7 (3)-1** in **Appendix C2** shows the 10 locations used, which are also referenced in **Exhibit 3.3.1.7 (3)-2**.

Existing pedestrian facilities provide direct routes between many locations, but some of those facilities do not accommodate bicycles. The proposed paths and crossings would allow for more direct travel for both pedestrians and bicyclists as shown in **Exhibit 3.3.1.7 (3)-2**. Bicycles would benefit the most from the proposed changes as illustrated by the reduction in the directness ratio. For example, the north and south sides of Delaware Park would become far more accessible from each other upon completion of the project.

Exhibit 3.3.1.7 (3)-2
Route Directness Summary

Origin	Destination	Straight-Line Distance	Directness Ratio (Ped/Bike) – Existing	Directness Ratio (Ped/Bike) – Proposed
[1] Delaware Park (South Side)	[2] Delaware Park (Tennis Courts)	733 ft (0.14 mi)	2.53 / 5.04	2.53 / 2.68
[1] Delaware Park (South Side)	[3] Delaware Park (North Side)	1161 ft (0.22 mi)	1.50 / 4.66	1.31 / 1.31
[1] Delaware Park (South Side)	[4] Delaware Park (Parking Area)	3343 ft (0.63 mi)	1.38 / 2.48	1.14 / 1.18
[5] Buffalo State College	[3] Delaware Park (North Side)	4114 ft (0.78 mi)	1.36 / 1.44	1.18 / 1.18
[5] Buffalo State College	[6] Wegmans Lot	2200 ft (0.42 mi)	1.80 / 1.80	1.12 / 1.12
[7] Medaille College	[6] Wegmans Lot	8553 ft (1.62 mi)	1.29 / 1.71	1.16 / 1.21
[7] Medaille College	[8] Albright Knox Art Gallery	5516 ft (1.04 mi)	1.46 / 2.17	1.20 / 1.33
[8] Albright Knox Art Gallery	[9] Japanese Garden	1067 ft (0.20 mi)	2.44 / 2.44	1.52 / 1.52
[10] Tops Plaza	[4] Delaware Park (Parking Area)	9453 ft (1.79 mi)	1.18 / 1.18	1.15 / 1.15
[10] Tops Plaza	[1] Delaware Park (South Side)	6137 ft (1.16 mi)	1.20 / 1.20	1.16 / 1.19

Notes:

- The shortest paths for bicyclists avoid the stairs on the bridge over Delaware Avenue, biking on sidewalks or against traffic on roadways, and traveling the wrong way on South Meadow Drive in Delaware Park. When possible, shared-use paths were utilized for bike routes instead of footpaths.
- Directness represents the amount of out-of-direction travel required to get between two points. Lower results (closer to a ratio of 1.0) indicate strong, connected networks with little out-of-direction travel.

B. Crossing Opportunities

The number of available crossing opportunities can be used as a measure of connectivity for an area. The number of opportunities to cross NYS Route 198 within the project limits, both grade-separated and at-grade, were compared under existing and proposed conditions.

Existing:

2 crosswalks at one at-grade intersection
1 pedestrian bridge
3 grade-separated roadways, with sidewalks on both sides
---
6 total

Proposed:

6 crosswalks at 5 at-grade intersections
2 signalized at-grade pedestrian crossings
1 pedestrian bridge
3 grade-separated roadways, with sidewalks on both sides
---
12 total

The number of proposed opportunities for pedestrians and bicycles to cross NYS Route 198 would be double the existing number available.

C. Level of Service

Pedestrian Level of Service (LOS) was analyzed for representative locations using the methods of the HCM2010. For crosswalks at signalized intersections, a pedestrian LOS score is calculated based upon the roadway cross-section, motorized vehicle volume and speed, and pedestrian delay. The LOS score is an indication of the typical pedestrian's perception of the overall crossing experience. Each LOS, "A" (best) through "F" (worst) is associated with a range of scores. The score and LOS for representative crosswalks on NYS Route 198 are shown in **Exhibit 3.3.1.7 (3)-3**.

Exhibit 3.3.1.7 (3)-3
Pedestrian Level of Service at Representative Locations

Intersection	Intersection Leg Crossed	Pedestrian LOS Score	Pedestrian LOS
NYS Route 198 @ Hoyt Lake Pedestrian Crossing[1]	East & West	2.96	C
NYS Route 198 @ Delaware Avenue Connector[2]	West	3.35	C
	South	3.21	C
NYS Route 198 @ Parkside Avenue	West	3.16	C
	East	4.30	D

Notes:
1: Representative of the dedicated, at-grade pedestrian crossings
2: Representative of at-grade intersection crossings between Grant Street and Parkside Avenue

As shown, the proposed crosswalks are expected to provide pedestrians with an average experience, directly positioned between the best and worst possible outcome. The results are heavily influenced by the volume of motor vehicle traffic, signal cycle length, and percent of turning (conflicting) traffic. The analysis also considers each crosswalk as one continuous experience from one side of the roadway to the other. It does not explicitly account for the presence or benefits of pedestrian refuge islands, pedestrian signals with countdown timers, presence of pedestrian push buttons and audible signals, the raised geometry of each crossing, colored crosswalk materials, adjacent landscape treatments, or the presence of pedestrian-scale lighting. These features are expected to enhance the pedestrian crossing experience and to improve upon the base pedestrian score and LOS. Furthermore, the results shown are representative of the evening peak hour. The pedestrian experience is expected to be better during the morning and off-peak periods, when the volume of motor vehicle traffic is lower.

Bicycle LOS was not explicitly calculated; however logically, the signing of NYS Route 198 as a bicycle route would improve accommodation for commuter bicyclists in comparison to the existing condition with bicycle traffic restricted from using the roadway.

3.3.1.7 (4) NYS Route 198 Eastern Transition Zone Analysis

The intersection of Main Street (NYS Route 5), Kensington Avenue, and Humboldt Parkway is located approximately 1,300 feet east of the Parkside Avenue intersection. It is grade separated (above) NYS Route 198. The intersection can be accessed via slip ramps connecting NYS Route 198 with Humboldt Parkway. Traffic signals control the intersections of Main Street with Humboldt Parkway. The intersections of Kensington Avenue and Humboldt Parkway are stop controlled.

As noted in **Section 2.1.1**, the posted speed limit on NYS Route 198, from I-190 to NYS Route 33, was reduced from 50 miles per hour to 30 miles per hour at the direction of the Governor of New York State on May 31, 2015. Interim traffic calming measures were subsequently installed by the NYSDOT to support the new speed limit. Interim treatments in the eastern transition zone, defined as NYS Route 198 between Parkside Avenue and NYS Route 33, include:

- Speed limit reduction signing with flashing warning beacons;
- Speed limit reduction pavement markings;
- Reduction in lane widths to 11-feet;
- Reduction of the ramp connecting NYS Route 33 eastbound with NYS Route 198 westbound from two lanes to one;
- Reduction of the weave area between the NYS Route 33 ramps and the exit ramp to Humboldt Parkway westbound from four lanes to three;
- Elimination of an entrance ramp from Humboldt Parkway westbound to NYS Route 198 westbound;
- Marking a formal on-street parking lane and a bicycle lane on Humboldt Parkway westbound, operationally reducing the westbound approach to Kensington Avenue from two lanes to one at the request of the City of Buffalo.

During that same timeframe, the City of Buffalo independently reduced Parkside Avenue, north of NYS Route 198, from two travel lanes in each direction to one as part of a traffic calming and safety improvement project. This type of change is commonly known as a road diet.

New traffic data were collected and compiled in 2017 to assess changes in this area in response to public and stakeholder comments. Traffic operations were modeled using Vissim. A document providing details regarding the analyses and results is included in **Appendix C2**. The following is a brief summary of the findings:

- A comparison of motor vehicle volumes collected in 2008 and those collected in 2017 indicated there has been an increase in motor vehicle traffic within the study limits, including approaching the intersection of Humboldt Parkway with Kensington Avenue.
- Existing condition Vissim modeling and 2017 field observations confirm that peak hour congestion is occurring on the westbound Humboldt Parkway approach to Kensington Avenue, in the westbound weave between the NYS Route 33 ramps and the off-ramp to Humboldt Parkway, and northbound on Parkside Avenue. These conditions are independent of operations elsewhere on the NYS Route 198 Corridor (i.e. they are not precipitated by congestion or delays elsewhere in the corridor). The amount of motor vehicle congestion can vary greatly by day, and even within the typical peak hour, which is indicative of a system that is operating near or at its vehicular capacity.
- It appears that these conditions are due to a combination of factors including a general increase in motor vehicle traffic between 2008 and 2017, the addition of a formal parking lane and bicycle lane on the westbound Humboldt Parkway approach to Kensington Avenue, a reduction in the number of lanes available for motor vehicle traffic in the weave area between NYS Route 33 and the off-ramp to westbound Humboldt Parkway, and the City of Buffalo's Parkside Avenue road diet. In general the physical and pavement marking changes have reduced motor vehicle capacity.
- Conditions in this area are expected to worsen in the future if no action is taken, resulting in a "bottleneck" that would prevent some motor vehicle traffic from making its way into the NYS Route 198 (Scajaquada Expressway) Corridor project area.
- The Build Alternative improvements would not negatively impact traffic operations within the eastern transition zone, nor would they preclude the NYSDOT from progressing an independent action to study and address the identified issues along NYS Route 198 within the eastern transition zone. If the "bottleneck" were removed, the Build Alternative would be able to handle the anticipated traffic as described in Section 3.3.1.7 (1). The City of Buffalo has plans to progress an independent action to improve pedestrian, bicycle, and motor vehicle operations and safety at the intersection of Main Street, Kensington Avenue, and Humboldt Parkway. Construction is tentatively planned for 2019.

3.3.1.7 (5) – Work Zone Safety & Mobility

A. Work Zone Traffic Control Plan

A conceptual work zone traffic control scheme was developed for the Build Alternative. For discussion purposes, the sequencing of improvements has been broken down into three distinct construction stages as shown in **Exhibit 3.3.1.7 (5)-1** in **Appendix A1**. These stages are:

- Stage 1 – Delaware Avenue to Parkside Avenue
- Stage 2 - Elmwood Avenue Section
- Stage 3 – Grant Street Section

Based on funding availability, it is anticipated that Stages 1 and 2 would be constructed as part of one construction contract (Contract 1). Off-corridor traffic control changes identified in **Section 3.3.1.7** would be included in Contract 1. Stage 3 would follow in a separate construction contract (Contract 2).

In general, the work would include pavement reconstruction, milling and resurfacing, curb and barrier, drainage, lighting, signing, landscaping, striping, shared-use path construction, sidewalks, footpaths, parking area reconstruction, relocation of an affected statue, gateway features, and the removal of existing pavement and other features. All stages would include appropriate interim measures to transition between the new work and existing facilities where required.

A lack of convenient, parallel facilities with adequate capacity to serve as a primary detour necessitates that NYS Route 198 be reconstructed on alignment. This would require a combination of temporary pavement in the existing median, reconstructed and widened shoulders to support shifted traffic, and minor widening to the outside of the existing footprint but within the right-of-way. It would be desirable to maintain a minimum of two through lanes in each direction throughout the corridor; however, the roadway is confined by water features, Delaware Park, Forest Lawn Cemetery, neighborhoods, and various cultural and historic institutions. There are also several bridges along the corridor and the existing median is narrow. The amount of space available to build temporary pavement for the accommodation of traffic just off the existing alignment would be limited; therefore, lane closures along NYS Route 198 would be necessary to build certain parts of the project. Temporary ramp controls and/or closures with local detours would also be needed.

In constrained areas, elimination of the existing barrier between opposing directions and replacement with cones or tubular markers would be considered to accommodate multiple lanes of through traffic. It may also be necessary to restrict portions of NYS Route 198 to one through travel lane in each direction for extended periods to complete staged construction.

Three specific locations were identified where corridor constraints would make it difficult, if not impossible, to maintain two through lanes of traffic in each direction during construction. These include:

- NYS Route 198, from the end of the viaduct to the NYS Route 198 bridge over Scajaquada Creek;
- Beneath the existing pedestrian bridge over NYS Route 198; and
- At the existing bridge over Delaware Avenue (NYS Route 384).

A condition where NYS Route 198 would be reduced to one through travel lane in each direction between Grant Street and Parkside Avenue (Alternative 3) was studied during the scoping phase of this project. (Refer to the project *Scoping Document* for a summary discussion of Alternative 3 and *Scoping Document* Appendix C for the accompanying traffic analysis. Traffic diversion to the local street network was projected to affect 12 intersections adjacent to NYS Route 198 and involving the streets listed below. Note that traffic impacts due to construction staging would be temporary, and at no time during construction would the entire length of NYS Route 198 be restricted to one through travel lane in each direction, therefore the scoping analysis is considered conservative as it applies to work zone traffic control.

- Hertel Avenue;
- Amherst Street;
- Middlesex Road;

- Nottingham Terrace;
- Rockwell Road;
- Forest Avenue;
- Delavan Avenue;
- Elmwood Avenue;
- Delaware Avenue; and
- Main Street.

The NYSDOT would review potential traffic signal optimizations and/or other temporary traffic control measures during final design in order to address the anticipated impact of detoured traffic on these adjacent local streets. Refer to **Section 3.3.1.7 (3) C** for additional information on public outreach and information aspects of the proposed Transportation Management Plan.

The NYSDOT has published time restrictions for lane closures on highways under its jurisdiction, including the Scajaquada Expressway. On NYS Route 198, the restrictions are designed to limit delay given the heavy volume of commuter traffic (refer to **Exhibit 3.3.1.7 (5)-2** in **Appendix C1** for a list of restrictions). These restrictions would be reviewed during final design, and where justifiable, temporarily amended to facilitate construction operations along NYS Route 198, advance the work on schedule, and control construction costs.

The need for night time work, including night time lane and/or roadway closures, is anticipated. Given the adjacent residential and academic communities, noise generated by night time construction would be of concern and certain types of work would be restricted or prohibited in certain areas. However, it may be cost effective to build certain elements of the project at night to allow for longer, more productive work shifts, especially if daytime lane closures must be limited.

Pedestrian and bicycle accommodations would be maintained throughout the duration of construction. Staging of these features would also be considered to maintain accommodation. Where construction operations impact these facilities, pedestrian and bicycle traffic would be detoured around the construction site or temporary facilities provided. Coordination with local groups such as the Buffalo Riverkeeper would be done at various stages of construction to ensure the safety of canoeists using Scajaquada Creek. Access for emergency vehicles, school buses, and transit would be maintained.

The following text summarizes the conceptual phasing plan for the reconstruction of NYS Route 198. The sequence of work for each stage is conceptual and subject to change during final design.

Stage 1 - Delaware Avenue to Parkside Avenue (Contract 1):

The work would include:

- Intelligent Transportation Systems (ITS) work;
- Reconstruction of just under 5,000 feet of NYS Route 198, from just west of the bridge over Delaware Avenue to the Main Street underpass;
- Rehabilitation of the NYS Route 198 Bridge over Delaware Avenue;
- Reconstruction of Delaware Avenue, from the proposed intersection with the Delaware Avenue Connector to Nottingham Terrace (+/- 1,400 feet);
- Reconstruction of Parkside Avenue north and south of NYS Route 198 (+/- 700 feet);
- Delaware Park entrance and parking area modifications;
- Construction of a new intersection at the City of Buffalo Parks Maintenance Facility;
- Construction of the Delaware Avenue Connector;
- Installation of three new intersection traffic signals, two replacement signals, and one pedestrian crossing signal (on Delaware Avenue);
- Removal of existing ramps at the Delaware Avenue interchange;

- Shared-use path, footpath, sidewalk, and raised crossing construction; and
- Traffic control changes at off-corridor intersections.

NYS Route 198 would be reconstructed one-half at a time, maintaining at least one through travel lane in each direction between Delaware Avenue and the eastern project limit. Ramps DC and DD would be closed to allow for construction of the Delaware Avenue Connector while all traffic is maintained using Ramps DA and DB using temporary traffic signals. Ramps DE and DF would also remain open. New signalized intersections both on NYS Route 198 and Delaware Avenue would be installed. When access between NYS Route 198 and Delaware Avenue has been moved to the connector, the remaining portions of NYS Route 198 would be reconstructed, existing ramps removed, and the median completed. The Parkside Avenue intersection would be reconstructed in segments; however, auxiliary lanes would be maintained to the greatest extent practical. Work affecting operations of the signalized intersection could be completed during off-peak periods. Assuming Stages 1 and 2 would be completed under one Contract, moving the Elmwood Avenue Connector Bridge to Stage 1 and the rehabilitation of the NYS Route 198 Bridge over Delaware Avenue to Stage 2 to facilitate work zone traffic control would be evaluated during final design.

Stage 2 - Elmwood Avenue Section (Contract 1):

The work would include:

- Remaining ITS work;
- Reconstruction of NYS Route 198 (+/- 4,400 feet);
- Reconstruction at the Elmwood Avenue and Nottingham Terrace intersection;
- Reconstruction of the (southern) Lincoln Parkway Connector to eastbound NYS Route 198 (+/- 210 feet);
- Construction of one shared-use path bridge over Scajaquada Creek and the removal of one existing ramp bridge (Ramp EK);
- Construction of the Elmwood Avenue Connector including removal of the existing ramp bridge (Ramps EB and ED) and the erection of a new bridge;
- Construction of the northern Lincoln Parkway and southern Lincoln Parkway Connectors;
- Installation of three new signals and one replacement signal;
- Rehabilitation of the NYS Route 198 Bridge over Scajaquada Creek at Mirror Lake and Hoyt Lake;
- Miscellaneous repairs to the existing pedestrian bridge over NYS Route 198;
- Rehabilitation of the NYS Route 198 Bridge over Delaware Avenue;
- The removal of any remaining existing Elmwood Avenue interchange ramps; and
- Construction of new shared-use path connections and raised crossings.

Local road and ramp work would be done early in this stage in order to maintain connectivity with NYS Route 198. The ability to maintain auxiliary lanes at the Elmwood Avenue Connector and Nottingham Terrace intersection would be reviewed during final design. Work on NYS Route 198 would be done one-half at a time by shifting travel lanes and maintaining a minimum of one through travel lane in each direction between the western project limit and Delaware Avenue. The rehabilitation of NYS Route 198 over Scajaquada Creek at Mirror Lake and Hoyt Lake would also be completed at this time utilizing staged construction. The Lincoln Parkway Connectors would be reconstructed under full closure with temporary detours. When access between NYS Route 198 and Elmwood Avenue, Lincoln Parkway, Nottingham Terrace, and Iroquois Drive has been reestablished, the remaining portions of NYS Route 198 would be reconstructed, existing ramps removed, and the median completed. The new shared use path bridge over Scajaquada Creek would be completed upon removal of Ramp EK.

Assuming Stages 1 and 2 would be completed under one Contract, moving the Elmwood Avenue Connector Bridge to Stage 1 and the rehabilitation of the NYS Route 198 Bridge over Delaware Avenue to Stage 2 to facilitate work zone traffic control would be evaluated during final design.

Stage 3 - Grant Street Section (Contract 2):

The work would include:

- Reconstruction of approximately 3,700 feet of NYS Route 198, from the viaduct to just west of the Elmwood Avenue Connector;
- Reconstruction of Grant Street, from Buffalo State College to the Grant Street Bridge over NYS Route 198 (+/- 850 feet);
- Construction of the Grant Street Connectors, including one new bridge over Scajaquada Creek;
- Construction of a new shared-use path bridge over Scajaquada Creek and a raised crossing of NYS Route 198;
- Construction of the proposed roundabout;
- Installation of two new signals and one signal replacement; and
- Construction of new shared-use path connections.

The suggested construction sequence would use lane shifts and lane closures, maintaining a minimum of one through travel lane in each direction at all times. Existing Ramps GE and GF would be closed and traffic detoured in order to construct the northern NYS Route 198 connector to Grant Street, including its new bridge over Scajaquada Creek. This connection must be established first, in order for the connection to the south (between the proposed roundabout and Grant Street) to function properly. The same type of closure and detour would be utilized to replace existing Ramps GB and GC while the roundabout is under construction. Closing these ramps would facilitate construction of the roundabout while maintaining NYS Route 198 traffic. It is assumed that construction of the proposed roundabout and (southern) connector would take place while Buffalo State College is not in session. Grant Street would be reconstructed while maintaining at least a single lane in each direction. Specific consideration would be given during final design to the need for and provision of auxiliary lanes at intersections during construction.

B. Special Provisions

Special provisions, including accelerated construction practices and A+B bidding, would be considered during final design to reduce the impacts to the traveling public. Additionally, time-related contract provisions would be considered to provide incentives to contractors for completing work ahead of schedule and disincentives for not meeting specified deadlines. Dedicated tow truck service and police enforcement are other measures that could be implemented to help keep vehicular traffic flowing smoothly during construction. The need for night time construction is anticipated given current lane closure restrictions and the complex nature of the proposed work. The construction of temporary traffic calming features and required mitigation on adjacent urban streets would be discussed with the City of Buffalo during the final design phase.

NYS Route 198 is an important component of the local and regional transportation network. As such, the work zone traffic control for this project and that for any adjacent projects that may use this corridor as a detour would require coordination. No projects have been identified that would use NYS Route 198 as a detour at this time. Overlapping detours or construction timeframes on NYS Route 198 and any adjacent or nearby facilities should be avoided. The work zone traffic control scheme for NYS Route 198 would be coordinated with local officials, emergency service providers, adjacent hospitals, educational institutions, and businesses. Commuters and residents would be kept informed through public service announcements, the project website, newsletters, and public meetings.

C. Significant Projects (per 23 CFR 630.1010)

This project has been classified by the NYSDOT as a significant project per 23 CFR 630.1010. A Transportation Management Plan (TMP) would be prepared consistent with 23 CFR 630.1012. The TMP would consist of:

- A Temporary Traffic Control (TTC) plan
- A Transportation Operations (TO) component
- A Public Information component (PI)

These components would be used to review the anticipated regional transportation system impacts of this project. Key elements would include coordination with Niagara International Transportation Technology Coalition (NITTEC) for notifying the traveling public of work operations, posted detours, traffic congestion, and incidents; the development of incident management plans; and other notification systems for the traveling public. It is anticipated that the reach of the traffic management plan would include NYS Route 198, adjacent collectors and arterials, and the regional ring of expressways including I-190, I-90, I-290, and NYS Route 33.

3.3.1.8. Safety Considerations, Accident History and Analysis

As summarized in **Section 2.3.1.8 (2)**, NYS Route 198 has continued to experience accidents since the posted speed limit was reduced to 30 miles per hour. Rear end collisions were common at the stop-controlled entrances to the Scajaquada Expressway near Delaware Avenue prior to the implementation of interim traffic calming measures in 2015. Those interim measures included the removal of acceleration lanes and the installation of stop signs at all remaining entrance ramps, with the exception of the entrance from Grant Street to westbound NYS Route 198 (Ramp GF). The 2015 accident study, completed following the posted speed limit change, suggests that a similar pattern of rear end accidents has emerged at the new stop-controlled entrances. The Build Alternative would replace seven of the eight stop-controlled entrances with signalized intersections and one roundabout. It is anticipated that this change would reduce the frequency of rear end accidents approaching NYS Route 198. However, with the introduction of signalized intersections along NYS Route 198, rear end collisions may begin to occur on the new urban boulevard.

Sideswipe and rear end accidents also frequently occur due to congestion along westbound NYS Route 198 approaching the Delaware Avenue off ramp (Ramp DF). Vehicles are often slowed or stopped in the right-hand lane just upstream of the Delaware Avenue bridge. This condition is a direct result of the following elements:

- The short distance on Ramp DF between NYS Route 198 and Nottingham Terrace (300 feet).
- The stop sign when Ramp DF meets Nottingham Terrace
- The short distance between Ramp DF and the traffic signal at Delaware Avenue (< 70 feet)

The Build Alternative would eliminate this ramp, the closely spaced intersections, and corresponding accident patterns. Sideswipes were the second most frequent type of accident occurring on NYS Route 198 following the speed limit reduction to 30 miles per hour. Injury accidents account for 42% of the total accidents. Although the introduction of vertical traffic calming features along the roadside would not totally eliminate this type of accident or injuries, elements such as curb, light poles, and trees to be added under the Build Alternative would encourage greater uniformity in vehicular speeds and bring vehicular speeds into greater conformance with the posted speed limit, thus reducing the overall accident severity index.

Accident studies preceding the change in speed limit identified six High Accident Locations (HAL). That includes four Priority Investigation Locations (PIL) and two Safety Deficient Locations (SDL). All six would be addressed by the Build Alternative as follows:

Exhibit 3.3.1.8
Summary of Proposed Changes to High Accident Locations (HAL)

HAL Type	Location	Disposition
PIL	Grant Street interchange	Interchange removed and replaced with one roundabout and one signalized intersection
PIL	Elmwood Avenue interchange	Interchange removed and replaced with one signalized intersection and a right-in, right-out only access to Iroquois Drive.
PIL	NYS Route 198 from Lincoln Parkway to Delaware Avenue	Introduction of additional curvature to encourage vehicular speeds consistent with the posted speed limit
PIL	NYS Route from the Delaware Avenue interchange to the Parkside Avenue intersection	Delaware Avenue interchange ramps removed. Traffic signal installed at the Delaware Park Maintenance Facility. Slip lanes removed and signal replaced at the Parkside Avenue intersection. With the addition of other signals along NYS Route 198, the Parkside Avenue location becomes more consistent with the rest of the facility.
SDL	1,000 feet of NYS Route 198 east of the Grant Street interchange	Interchange removed. Expressway changed to urban boulevard.
SDL	Approximately 500 feet to either side of the Parkside Avenue intersection on NYS Route 198	Expressway changed to boulevard. Slip lanes to be removed and signal to be replaced. With the addition of other signals along NYS Route 198, the Parkside Avenue location becomes more consistent with the rest of the facility.

Proposed at-grade pedestrian and bicycle crossings would be raised, marked, signalized, and include median refuge islands to enhance safety for these users wherever possible. Mid-block pedestrian and bicyclist crossings would be controlled using three-color traffic signals. Refer to **Sections 3.3.2.1** and **3.3.2.2** for additional information on proposed pedestrian and bicyclist features.

Target clear zones have been considered in accordance with Chapter 10 of the NYSDOT HDM. Refer to **Section 3.3.3.1. (6) (g)** for a detailed discussion of target clear zones. The right-of-way acquisitions described in **Section 3.3.3.1 (1)** include the target clear zones, ensuring the NYSDOT can maintain the quality of the clear areas over time to maintain safety. Guide railing and other types of barrier would be installed to meet current standards. Refer to **Section 3.3.3.8** for a description of proposed guide railing and barrier treatments to address roadside issues under the Build Alternative.

The Build Alternative would include a median, as described in **Section 3.3.3.8,** as a safety feature. Comments were received as a result of public and stakeholder outreach asking for the elimination of the median. Based on the difference in average collision rates between undivided and divided roadways statewide, and in consideration of the collision rate calculated for the period starting on June 1, 2015 and ending on March 31, 2017, it was estimated that the crash rate would increase by 25% if NYS Route 198 were to be reconstructed without a median. The estimated annual safety benefit of keeping the median is estimated at $1.3 million.

In summary, accident rates and the severity of those accidents that occur are expected to drop under the Build Alternative in comparison to conditions experienced along the corridor prior to May 2015. Accident patterns are expected to remain similar to what has existed since the posted speed limit was changed to 30 miles per hour and interim traffic calming features were put in place. The introduction of signalized intersections under the Build Alternative may result in additional right angle or rear-end collisions on NYS Route 198. The addition of a roundabout would reduce the number of right-angle collisions at the location of the former Grant Street interchange and reduce the severity of crashes there. Lower operating speeds should reduce the frequency and severity of run-off-the-road crashes.

3.3.1.9. Impacts on Police, Fire Protection and Ambulance Access

Police, fire, and ambulance services would not be substantially affected. All major access points to the corridor (at cross streets) would be retained. Raised crossings would be designed and constructed in accordance with current NYSDOT standards and therefore accommodate emergency vehicles including fire trucks. Incident response times during peak traffic periods could increase slightly during peak traffic periods given the removal of free flow ramps and the installation of signals. However, the ability of emergency service providers to reach incidents along the corridor would be improved by new median breaks at the proposed roundabout, Elmwood Avenue Connector, the bridge over Delaware Avenue, Delaware Avenue Connector, and at the Buffalo Parks Maintenance Facility. Opportunities for the enhanced accommodation of speed enforcement activities would be examined during final design. Refer to **Section 3.3.1.7 (3)** for a discussion of the anticipated impacts during construction.

The existing NYSDOT incident response plan, which includes a circulating Highway Emergency Local Patrol (HELP) truck and video observation of the corridor via closed circuit television (CCTV) cameras, would be amended to address the operational needs of the new urban boulevard upon the completion of construction. The NYSDOT would discontinue the HELP patrol on NYS Route 198 after it is converted from an urban expressway to an urban minor arterial.

3.3.1.10. Parking Regulations and Parking Related Issues

In general, there are no proposed changes to on-street parking regulations. Parking and stopping would be prohibited on both NYS Route 198 and its connector roadways. Parking would continue to be allowed on intersecting and abutting highways. Impacts to specific parking spaces and areas would be as follows:

- A passenger car making a right turn on red from the Buffalo Parks Maintenance Facility driveway would require 335 feet of intersection sight distance to the left to safely complete the move, assuming an approach speed of 35 miles per hour. Adequate sight distance would be provided from a drivers' eye location set six feet behind the stop line. However, a single unit truck would require 440 feet to make the same turn. In order to satisfy this requirement, seven existing parking spaces facing NYS Route 198, just west of the proposed intersection, would need to be eliminated. If the single unit truck were to pull forward, with its nose right at the crosswalk, adequate intersection sight distance would become available. An alternative to removing the spaces could be to restrict right turns on red. The NYSDOT has approached the City of Buffalo Parks Department regarding this issue and discussions will continue into the final design phase.

- Access to and egress from the existing Delaware Park parking lot just west of Parkside Avenue would be modified. The proposed layout shown in the plans in **Appendix A2** was developed based on input from the Olmsted Parks Conservancy. The Parkside Avenue access would be converted to an entrance only. This would avoid having traffic exit onto Parkside Avenue immediately adjacent to NYS Route 198 (within the extent of the southbound right turn lane). The design would also include a new exit to NYS Route 198 westbound. Together the entrance and exit would mimic the historic shape of Agassiz Circle.

3.3.1.11. Lighting

Changes to NYS Route 198 would directly impact existing light poles, buried conduit and wire, and electrical feeds to the existing lighting systems. The existing poles, arms, and lights would be removed and replaced with Olmsted style, roadway scale ornamental light poles and fixtures. These would match the lights recently installed on the Elmwood Avenue Bridge over NYS Route 198 and other roadways, such as Delaware Avenue, within the vicinity of Delaware Park.

Most new poles would be installed in the median with single- or double-truss arms as needed. This placement would reduce the chance of being struck by an errant vehicle. Some poles would also be installed along the outside of NYS Route 198 and its connector roadways where the median is too narrow to safely support installation. These light poles would be set behind the proposed curb.

In general, lighting along other roadways and parking areas impacted by the project would be replaced in kind, similar to the existing or adjacent system. Pedestrian scale “Central Park” style poles and lighting fixtures may be installed at pedestrian crossings and on proposed shared use path bridges as determined during final design. Existing and new segments of shared-use path and footpaths would not be lighted. All new lighting systems would be designed to meet applicable codes and standards.

3.3.1.12. Ownership and Maintenance Jurisdiction

In general, the NYSDOT and City of Buffalo would continue to maintain the facilities they currently own. Ownership and Maintenance Jurisdiction for the Build Alternative would remain as depicted in **Exhibit 2.3.1.12**, except as follows:

1. New connector roadways at Grant Street, Elmwood Avenue, Lincoln Parkway, and Delaware Avenue would be owned and maintained by the NYSDOT.

2. All new signals listed below (a through h) would be owned and maintained by the NYSDOT. The NYSDOT would assume ownership and maintenance responsibility for signals i, j, and m. The NYSDOT would also ownership of signals k and l but would seek a maintenance agreement with the City of Buffalo. The NYSDOT will develop an Arterial Management Agreements with the City of Buffalo, for approval by the FHWA, prior to the completion of final design. The proposed pedestrian crossing signal on Delaware Avenue (n) would be owned and maintained by the City of Buffalo.

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    a. NYS Route 198 at the Northern Grant Street Connector to Westbound NYS Route 198.
    b. NYS Route 198 at the Buffalo State College crossing
    c. NYS Route 198 at the Elmwood Avenue Connector.
    d. NYS Route 198 at the Southern Lincoln Parkway Connector
    e. NYS Route 198 at the Hoyt Lake crossing
    f. NYS Route 198 at the Delaware Avenue Connector
    g. NYS Route 198 at the City of Buffalo Parks Maintenance Facility.
    h. Delaware Avenue at the Delaware Avenue Connector
    i. Grant Street at the Southern NYS Route 198 Connector and Buffalo State College
    j. Grant Street at the Northern NYS Route 198 Connector and Tops Plaza Entrance
    k. Grant Street at Amherst Street
    l. Delaware Avenue at Nottingham Terrace
    m. Elmwood Avenue at the Elmwood Avenue Connector and Nottingham Terrace

3. Medians along NYS Route 198 and the connector roadways would be owned and maintained by the NYSDOT. The proposed median on Nottingham Terrace would be owned and maintained by the City of Buffalo. The median along Delaware Avenue would continue to be owned and maintained by the City of Buffalo.

4. Landscaping features (plants) contained within the highway boundary would be owned and maintained by the same agency that owns the adjacent roadway. Landscaping and trees outside the highway boundary would be owned and maintained by the adjacent property owner.

5. New shared-use path bridges over Scajaquada Creek would be owned and maintained by the City of Buffalo.

6. The existing bridge carrying the Southern Lincoln Parkway Connector (Three Nations Bridge) would continue be owned and maintained by the City of Buffalo.

7. New stormwater treatment facilities would be owned and maintained by the NYSDOT.

8. New driveways to and from the Delaware Park parking lot would be owned and maintained by the City of Buffalo.

9. All shared-use paths and foot paths would be owned and maintained by the City of Buffalo. This would include retaining walls required to support the path adjacent to Scajaquada Creek.

10. New light emitting diode (LED) lighting systems would be owned and maintained by the City of Buffalo up to the meter at the power point(s).

11. Gateway features would be owned and maintained by the City of Buffalo.

12. The NYSDOT and Buffalo State College would continue to own and maintain their respective ITS and fiber optic systems.

3.3.1.13. Constructability Review

A constructability review would be completed by the NYSDOT early in final design.

3.3.2. Multimodal

3.3.2.1. Pedestrians

Pedestrian accommodations throughout the Scajaquada Corridor would be substantially improved. Pedestrian elements would be designed and constructed in accordance with NYSDOT standards and the 2011 United States Access Board's *Proposed Guidelines for Pedestrian Facilities in the Public Right of Way* (PROWAG) except as noted in this FDR/FEIS.

As noted in **Section 2.3.2.1**, the existing pedestrian bridge over NYS Route 198 does not fully meet current accessibility guidelines. Existing railings and the spiral approach ramps to not satisfy current guidance. This structure would remain in service, undergoing miscellaneous spot repairs, under the preferred Alternative. As illustrated in **Exhibit 3.3.2.1-1,** two new fully accessible crossings would be constructed within 420 feet (to the west) and 715 feet (to the east) along the centerline of NYS Route 198. Non-accessible features retained as part of the project require a Non-Standard Feature Justification for Pedestrian Facilities and approval by the appropriate authority. Non-Standard Feature Justification Forms are included in **Appendix F** of this FDR/FEIS. The NYSDOT would reconsider the repair, replacement or removal of the existing pedestrian bridge, at the end of its useful life.

Sidewalks and curb ramps along local streets would be replaced where impacted by the project. A combination of new and existing shared-use paths (10 feet wide) and footpaths (five feet wide) would provide continuous accommodation along NYS Route 198 from Grant Street to Parkside Avenue. Effectively, pedestrians would be able to walk from Niagara Street to the Humboldt Parkway. Six new crossing opportunities would be added at Buffalo State College, Elmwood Avenue, Lincoln Parkway, Hoyt Lake, Delaware Avenue, and at the Buffalo Parks Maintenance Facility. These crossings, in addition to four existing grade separated crossing opportunities and two at-grade crossings at Parkside Avenue, would provide pedestrians with 12 different opportunities to cross NYS Route 198.

All at-grade crossings would have three-color signals and be equipped with pedestrian signals, push buttons, and countdown timers. Median refuges would be provided at intersection crossings of NYS Route 198. The use of color or texture to highlight at-grade crossing locations would be considered during final design. All crossings would be raised (either for the crosswalk alone or covering the entire intersection). Raised crossings would increase pedestrian visibility and assist in keeping speeds at or below the 30 mile per hour posted speed limit. Refer to **Section 3.3.3.2. (2)(f)** for additional information on raised crossings.

Other pedestrian oriented highlights include:

- A direct connection between the paths along NYS Route 198 and the Jesse Kregal Pathway would be provided using the Elmwood Avenue Connector;
- A new segment of path, passing over Scajaquada Creek along with NYS Route 198 in the vicinity of Hoyt Lake and Mirror Lake, would improve the pedestrian experience within the Japanese Gardens by providing a bypass for other pedestrians and bicyclists;
- New shared-use paths and footpaths within Delaware Park that follow the alignment of historic park pathways where practical; and
- Two new opportunities to cross Scajaquada Creek using the proposed shared-use path bridges.

A Capital Complete Streets Checklist is contained in **Appendix C1** as **Exhibit 2.3.2.1**. Anticipated Pedestrian volumes under the Build Alternative (Refer to **Section 3.3.1.7 (1)**) are based on the generators and destinations depicted in **Exhibit 3.3.2.1-2.** Delaware Park is a 350-acre park serving as the City of Buffalo's "Central Park". Park features include:

(1) 18-hole Golf Course;
(3) Baseball/Softball Diamonds;
(6) Football/Soccer/Rugby Fields;
(2) Lawn Bowling Courts;
(17) Tennis Courts;
(4) Basketball Courts;
(3) Playgrounds;
(17) Picnic Tables; and
(1) Picnic Shelter.

The Buffalo Zoo, the third oldest zoo in the United States, is adjacent to Delaware Park. Each year 400,000 visitors make this zoo the second largest tourism attraction in Western New York, second only to Niagara Falls.

There are also three colleges adjacent to Delaware Park. Buffalo State College lies to the southwest of Delaware Park and has over 10,000 students. Canisius College lies to the southeast and has over 4,500 students. Medaille College, also to the southeast, has over 3,000 students.

Community input received during project scoping demanded improved pedestrian connectivity to the park; so much so that one of the potential alternatives considered, but later dismissed, involved the removal of NYS Route 198 between Elmwood Avenue and Parkside Avenue. The desire for restoring connectivity from the north side of Delaware Park to the south side has been expressed since project inception by multiple the stakeholders and was therefore integrated with the project's Purpose and Need and objectives. The following are specific justifications for the various pedestrian crossings proposed under the Build Alternative.

- The crossing at Buffalo State is justified by the proximity of Buffalo State College (with over 10,000 students) and a Wegmans supermarket located directly across Scajaquada Creek, both large generators of pedestrian trips.
- The crossing of NYS Route 198 at the Elmwood Avenue Connector would link residential neighborhoods to the north of Nottingham Terrace with a proposed path on the south side of NYS Route 198. McKinley High School also lies just north of Scajaquada Creek and is an additional generator at this location.
- The pedestrian crossing at Lincoln Parkway would connect the portion of Delaware Park surrounding the Albright–Knox Art Gallery with the Jesse Kregal Pathway, the Buffalo History Museum, the Japanese Gardens, the Bust of Beethoven, the 1901 Pan-Am Exposition monument, and other park features. This crossing would be constructed at a signalized intersection that also allows traffic to enter onto NYS Route 198 eastbound from Lincoln Parkway. This alternative to the non-ADA compliant pedestrian bridge would provide a link requested by many stakeholders throughout the scoping phase.
- The proposed shared-use path crossing near Hoyt Lake, to the west of Delaware Avenue, would connect the Nottingham Terrace neighborhood, Jesse Kregal Pathway, and the existing tennis courts to the pathways on the south side of NYS Route 198 and the shoreline of Hoyt Lake. This would also serve as an alternative ADA-compliant crossing to the non-ADA compliant pedestrian bridge.
- The remaining crossings of NYS Route 198 at the Delaware Avenue Connector and the City of Buffalo Parks Maintenance facility would directly serve Delaware Park and provide alternatives to the Parkside Avenue intersection crossings.

The perimeter path in Delaware Park (North and South Meadow Drive) is heavily used by people walking, jogging, and bike riding. It is reasonable to assume that the pathways and crossings proposed under the Build Alternative would also see considerable use.

3.3.2.2. Bicyclists

Bicycle accommodation would also be greatly enhanced given the shared-use path connections and crossings described in **Section 3.3.2.1**. The proposed improvements would result in continuous accommodation for bicycles, separate from motor vehicles, along NYS Route 198 from Grant Street to Parkside Avenue. Effectively, bicycles would have continuous, separate accommodation from motor vehicles from Niagara Street to Parkside Avenue. The enhanced shared-use path network would accommodate all types of bicyclists and would be consistent with the City of Buffalo's *Bicycle Master Plan Update* of January 2016.

The Build Alternative would sign NYS Route 198 as a bicycle route and result in 5-foot wide shoulders that could be used, along with the travel lanes, by commuter bicyclists. Bicycle-friendly reticuline frames and grates would be installed on drainage structures. Periodic maintenance would be conducted by the NYSDOT to sweep the shoulders clean.

Use of NYS Route 198 as a bicycle route is shown on illustrations of the Build Alternative included in this document; however, before bicyclists may legally use the roadway, the functional classification would need to be changed from an urban arterial expressway to an urban minor arterial such that Section 1220 of the New York State Vehicle and Traffic Law and a June 1, 1963 Traffic Commission Order prohibiting pedestrians, animals, and non-motorized vehicles on expressways no longer applies. Bicycle lanes would not be marked until this condition is met. Under the Build Alternative, bicyclists would remain prohibited from using NYS Route 198 from I-190 to the Southern Grant Street Connector and from just east of Parkside Avenue to NYS Route 33 as those segments connect directly to other expressways.

The existing five-foot bicycle lanes on Delaware Avenue (NYS Route 384) would be replaced in kind within the limits of work. Discussions have taken place with the Buffalo Olmsted Parks Conservancy and the City of Buffalo regarding the possibility of restriping a portion of South Meadow Drive to contain a marked two-way cycle track, separated from a walking path on South Meadow Drive by a six-foot-wide buffer area, from the Nottingham Terrace entrance to the parking lot as illustrated on the Plans in **Appendix A2**. It is anticipated that those discussions would continue during the final design phase of this project.

3.3.2.3. Transit

As described in **Section 2.3.2.3**, the Niagara Frontier Transportation Authority (NFTA) provides bus service within and around the project area. Proposed geometric changes to NYS Route 198 would not adversely affect any existing bus routes or bus stop locations. The NFTA does not have any plans to add transit routes and stops along NYS Route 198 at this time; however, the proposed design would not preclude the addition of transit stops in the future.

3.3.2.4. Airports, Railroad Stations, and Ports

The Build Alternative would not affect the Greater Buffalo Niagara International Airport, NFTA light rail stations, or the Port of Buffalo.

3.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, and State Lands)

Access to adjacent parks, trails, and waterways would be retained or improved under the Build Alternative.

Changes to Vehicular Access – The driveway to the Delaware Park parking area from Parkside Avenue would be restricted to entering traffic only. This would prevent vehicles from exiting the park immediately adjacent to the Parkside Avenue intersection. This change would improve overall safety at the intersection. A new exit from the Delaware Park parking lot to NYS Route 198 would also be constructed. Together this entrance and exit would mimic the historic shape of Agassiz Circle.

Changes to Pedestrian and Bicyclist Access – Pedestrian and bicycle accessibility would be improved. New shared-use path connections and signalized crossings of NYS Route 198 would greatly improve connectivity among parts of Delaware Park once isolated from each other by the Scajaquada Expressway. Upon completion of the project, pedestrians and bicyclists would have continuous, parallel accommodation, separate from motor vehicles, throughout the project limits. Commuter bicycles would also be able to utilize NYS Route 198 after the roadway's functional classification is changed and it is signed as a bicycle route.

Changes to Waterway Access – New segments of shared-use path along the southern bank of Scajaquada Creek, between Grant Street and Lincoln Parkway, would open up access to that side of the waterway previously blocked by the Scajaquada Expressway.

3.3.3. Infrastructure

3.3.3.1. Proposed Highway Section

Refer to **Appendix A2** for plans, profiles, and typical sections illustrating the geometry of the Build Alternative. NYS Route 198 would typically have two 11-foot-wide travel lanes and two 5-foot-wide shoulders in each direction separated by a median. Turning lanes would also be constructed, where necessary, at intersections. The median would be raised and have a minimum physical width of 4 feet from face of barrier to face of barrier. Refer to the plans and typical sections for median widths and treatments at specific locations.

The proposed median treatment would include a 20-inch high (low-profile) concrete barrier, raising the median above the surrounding roadway, enhancing its visual prominence, acting as a traffic calming feature, and enhancing safety by separating opposing vehicular traffic. The face of the low-profile concrete barrier would have an aesthetic treatment, to be selected during final design. Median areas with a width less than 6-feet would have a hardscape (e.g. concrete) treatment between the barriers. Wider areas would include appropriate landscaping. The offset between a low-profile concrete barrier and the yellow edge line would be two feet. The proposed median and median planting plans would be reviewed with appropriate agencies and stakeholders during final design and refinements may be made to the design at that time.

There would also be segments with a lower, curbed median, particularly at intersections and the roundabout where these "islands" would help guide vehicular traffic and visually narrow the pavement while accommodating turning tractor-trailers. Refer to the typical sections in **Appendix A2** for illustrations of proposed median treatments.

3.3.3.1. (1) Right of Way

Right of way acquisitions proposed under the Build Alternative are summarized in **Exhibit 3.3.3.1. (1)**. As noted in **Section 2.3.1.2**, formal highway boundaries were not established along NYS Route 198 from just west of the Delaware Avenue interchange to the Parkside Avenue intersection at the time the expressway was originally constructed. The NYSDOT would acquire right of way in that area for NYS Route 198 as part of this project.

Permanent easements would also be acquired throughout the project limits for drainage outlets, intelligent transportation systems features, and electrical services. The total area of permanent easements is shown in **Exhibit 3.3.3.1 (1)**, including those within the bounds of Delaware Park (1869) and the City of Buffalo Olmsted Parks and Parkways Local Preservation District Boundaries (2001). Temporary easements would also be required to construct some project elements and/or to remove existing features.

All property will be acquired in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended.

Exhibit 3.3.3.1 (1) Right-of-Way Acquisitions				
TRN[3]	**Reputed Owner**	**Tax Map No.**	**Type of Acquisition**	**Estimated Acquisition Area (Acres)**
1	City of Buffalo	---	PE[4]	0.02
2	City of Buffalo & Others	88.42-1-7	PE & TE[4]	PE=0.01, TE=0.08
3	Genevjeve Niemiec, George A. Niemiec & Robert J. Niemiec	88.43-1-1	FEE[4] & TE	FEE=0.08, TE=0.17
4	NYS University College	88.43-1-4 (Buffalo State)	Concurrent Use and Occupancy Map	0.06
5	345 Amherst St. CO LLC	88.35-6-1.121	PE	0.09
6	City of Buffalo	88.36-1-22	FEE, PE & TE	FEE=0.18, PE=0.66, TE=2.83
7	City of Buffalo	88.36-1-22	FEE & TE	FEE=0.07, TE=0.21
8	City of Buffalo	89.38-1-11	FEE, PE & TE	FEE=0.02, PE=0.16, TE=0.80
9	City of Buffalo Delaware Park	89.14-3-1	FEE, PE & TE	FEE=0.78, PE=0.25,TE=2.41
10	City of Buffalo	Delaware Ave.	FEE & TE	PE=0.49, TE=0.03
11	City of Buffalo Delaware Park	89.07-1-1	PE & TE	FEE=0.09, PE= 0.19, TE=7.87
12	Canisius College of Buffalo, NY	89.57-4-2	TE	0.02
13	David M. Woollatt & Kimberly J. Reynolds	89.57-4-1	TE	0.01
17	City of Buffalo	Scajaquada Exwy.	FEE, PE & TE	FEE=0.58, PE=0.01, TE=2.62
18	The People of the State of New York	88.43-1-3 (Buffalo State)	Concurrent Use and Occupancy Map	0.14
19	New York State	88.12-2-1 (Buffalo State)	Concurrent Use and Occupancy Map	0.49
20	New York State	88.12-2-4.11 (Buffalo State)	Concurrent Use and Occupancy Map	0.33

Notes to Exhibit 3.3.3.1 (1):

1. TRN 14 through 16 were deleted after submission of the Draft ARM and are therefore not included.
2. Proposed property acquisitions do not reflect lands potentially returned to the City of Buffalo and Delaware Park. Refer to Section 4.4.12 for more information on potential exchanges of ROW.
3. TRN = Temporary Reference Number
4. TE = Temporary Easement, PE = Permanent Easement, FEE = Property Acquisition

3.3.3.1. (2) Curb

New curb would be installed within the project limits as summarized below. The installation of curb would assist with the conversion of NYS Route 198 to an urban boulevard. Other benefits would include drainage control, access control, and visual definition.

- Mountable curb (4-inch high) would be used along the outer (right side) edges of NYS Route 198 and the connector roadways. It would also be used around channelizing (median) islands at signalized intersections, at the roundabout (splitter islands), and extensions of the low-profile concrete barrier. Mountable curb would allow a disabled vehicle to be relocated just off the roadway in the event of an incident in areas without adjacent barrier or guiderail.

- Vertical-faced (6-inch high barrier) curb would be used around the central island of the proposed roundabout.

- Traversable curb would be used around the truck apron on the proposed roundabout.

- New curb would match the existing curb (material, profile, etc.) on adjacent and intersecting local streets where existing curb is impacted by construction.

3.3.3.1. (3) Grades

The maximum proposed grades are summarized in **Exhibit 3.3.3.1. (3)**.

Exhibit 3.3.3.1. (3)
Maximum Grades

Roadway	Maximum Grade (%)
NYS Route 198	4.0%
Connector Roadways	6.7%
Grant Street	3.7%
Elmwood Avenue	1.0%
Delaware Avenue	4.6%
Parkside Avenue	2.8%
Agassiz Circle Access Drive	3.3%
Other Local Streets	1.5%
Shared-use Paths	4.5%

3.3.3.1. (4) Intersection Geometry and Conditions

Refer to the plans contained in **Appendix A2** for an illustration of intersection geometry. Specific intersection features are summarized below:

- The eastbound right turn lane on NYS Route 198 at the proposed roundabout would be median separated, but vehicles would still yield to traffic exiting the circulatory roadway at the Grant Street Connector. The roundabout would also include a free-flow bypass lane for westbound through traffic.

- Entries to NYS Route 198 at the (northern) Grant Street Connector, both Lincoln Parkway Connectors, and the driveway from the Delaware Park parking lot would be designed to help discourage wrong way movements (i.e. left turns).

- Existing raised islands that separate right turning movements from the rest of the intersection at Parkside Avenue would be removed to make the location more pedestrian-friendly.

- Wide shoulders at intersections along NYS Route 198 would accommodate turning tractor trailers (i.e. the appropriate design vehicle per **Exhibit 3.2.3.3-4**), but white edge lines, as shown on the plans in **Appendix A2,** would be placed along the expected turning path of a passenger vehicle to visually narrow the intersection.

- Raised intersections would be installed along NYS Route 198 at the Elmwood Avenue Connector, Delaware Avenue Connector, and Parkside Avenue. Refer to **Section 3.3.3.3. (2)(f)** for additional information on raised crossings.

- Raised crossings of NYS Route 198 would be installed at Buffalo State College, the Southern Lincoln Parkway Connector, the Hoyt Lake Crossing, Delaware Park Crossing, and at the Buffalo Parks Maintenance Facility. Refer to **Section 3.3.3.3. (2)(f)** for additional information on raised crossings. An additional raised crossing would be constructed on the Northern Lincoln Parkway Connector.

- The elimination of the northbound right turn lane from Delaware Avenue to Nottingham Terrace would allow for the construction of a snow storage area and five-foot-wide sidewalk along the east side of the road.

- The eastbound Nottingham Terrace approach to Delaware Avenue would be reduced from three lanes (left turn lane, through lane, and right turn lane) to two (left turn lane and a lane shared by through movements and right turns) in conjunction with the removal of Ramp DE and Ramp DF. This would involve changes to pavement markings but not affect the width of the road.

3.3.3.1. (5) Roadside Elements

(a) Snow Storage

Snow storage along NYS Route 198 would typically be provided along and/or behind the curb or low-profile concrete barrier (Refer to the plans in **Appendix A2**). Special snow removal activities may be required during heavy winter weather events to prevent the encroachment of snowbanks into the travel lanes, shoulders, and/or shared-use paths (e.g. in areas where a path runs immediately alongside the roadway separated by a railing or low profile barrier is present). Snow storage would remain between the curb and sidewalk on local streets.

(b) Utility Strips

No dedicated utility strips would be created along NYS Route 198 or its connector roadways. Refer to **Section 3.3.1.4** for information on planned intelligent transportation system (ITS) improvements.

(c) Sidewalks See Section 3.3.2.1

(d) Bikeways See Section 3.3.2.2

(e) Bus Stops See Section 3.3.2.3.

(f) Driveways

New and reconstructed driveways would be modified to comply with the current NYSDOT *Policy and Standards for Design of Entrances to State Highways* or the City of Buffalo Department of Public Works' standards, depending on location, to the greatest extent practical.

An existing driveway to Niemiec Builders Supply would be relocated to move it away from proposed intersection changes on Grant Street. This would require a property acquisition from Buffalo State College as shown on the plans in **Appendix A2**. The existing driveway to the City of Buffalo Police radio tower facility would be replaced in kind. Driveway entrances and exits for the City of Buffalo Park Maintenance Facility would also remain.

The existing two-way driveway connecting Parkside Avenue with the Delaware Park parking area would be replaced with an entrance. Removing the exit to Parkside Avenue would enhance safety at the adjacent, signalized intersection. The exit from the parking lot would be redirected to NYS Route 198 westbound. Together these driveways would mimic the shape of the original Agassiz Circle. Refer to **Section 3.3.2.5** for additional information.

(g) Clear Zone

Target clear zones were selected based on guidance in the NYSDOT HDM Chapter 10. The presence of existing fixed objects, hazards that extend along the roadway, proposed cut slopes, proposed fill slopes, and roadway curvature were considered. The target clear zones along NYS Route 198 are summarized in **Exhibit 3.3.3.1 (6)-1**. Existing features that would encroach on the target clear zones are summarized in **Exhibit 3.3.3.1 (6)-2**.

Exhibit 3.3.3.1 (6)-1
Target Clear Zones

Direction	Location	Target Clear Zone
Eastbound	Grant Street Interchange to +/- STA ML 67+00	15 feet
	+/- STA ML 67+00 to +/- STA ML 73+50	17 feet
	+/- STA ML 73+50 to +/- STA ML 87+50	15 feet
	+/- STA ML 87+50 to +/- STA ML 92+50	See Note 1
	+/- STA ML 92+50 to Parkside Avenue Intersection	15 feet
Westbound	Grant Street Interchange to Parkside Avenue Intersection	15 feet

Notes:
1. Fill slopes in this area may vary from 1 vertical:3 horizontal to 1 vertical:2 horizontal, and therefore would be considered non-recoverable.

Exhibit 3.3.3.1 (6)-2
Target Clear Zone Encroachments Along NYS Route 198

Direction	Element	Station(s)	Offset[1]
Eastbound	Existing Pedestrian Bridge Abutment	ML 59+95	13 feet (right)
	Spirit of Womanhood (Statue)	ML 70+82	3 feet (right)[2]
	Delaware Bridge Parapet Walls	ML 77+75	12 feet (right)
Westbound	Existing Pedestrian Bridge Abutment	ML 59+95	12 feet (left)
	Delaware Bridge Parapet Walls	ML 77+75	14 feet (left)

Notes:
1. Offset measured from edge of traveled way (i.e. the white stripe).
2. To be relocated under the build alternative

As noted in **Section 2.1**, the posted speed limit along NYS Route 198 was reduced from 50 miles per hour to 30 miles per hour on May 31, 2015. Vehicular travel speeds within the project limits dropped from between 50 and 60 miles per hour to between 30 and 40 miles per hour subsequent to the change in the posted speed limit. Traffic calming elements within the Build Alternative are expected to further reduce the difference between the posted speed limit of 30 miles per hour and vehicular operating speeds. Furthermore, as noted in **Section 2.3.1.8 (1)**, prior to the change in speed limit, collisions with fixed objects (i.e. run off the road accidents) accounted for 20% of the accidents along NYS Route 198. During the period from June to October 2015 after the change to a 30 mile per hour posted speed limit, run off the road accidents and collisions with fixed objects did not comprise a substantial proportion of the accidents. At this time, accident and vehicular speed

trends appear supportive of a reduced clear zone within Delaware Park. With the additional changes to the corridor in the Build Alternative, consideration is being given to reducing the clear zone to ten feet on the outside (a five-foot clear area plus five feet across the shoulder from the edge of the vehicular travel way to the curb), three feet (minimum) in narrow median areas (a one-foot clear area plus a two-foot curb offset to the edge of the travel lane), and six feet in wider, planted median areas (a four-foot clear area plus a two-foot curb offset to the edge of the travel lane).

All tree plantings would be located during final design such that a five-foot (minimum) clear zone would be maintained with mature growth. The design clear zone would be refined during final design to adjust for slopes, roadway curvature, etc. Roadside barriers, such as guiderail or low profile concrete barrier, would be installed where fixed objects or other hazards within the clear zone cannot be removed.

3.3.3.2. Special Geometric Design Elements

3.3.3.2. (1) Nonstandard Features

During the preliminary design of the Build Alternative, special emphasis was made to ensure that the design would comply with the geometric features and cross sectional standards set forth in **Section 3.2.3.2**. Elements of the design that do not meet current standards are summarized below Non-standard feature justification forms are contained in **Appendix F**. Also refer to **Sections 2.3.2.1** and **3.3.2.1** for non-standard feature information related to Americans with Disabilities Act (ADA) accessibility and the existing pedestrian bridge over NYS Route 198.

(a) NYS Route 198

Lane Width: Travel lanes would be 11 feet wide. This is narrower than the 12 feet required for a Qualifying Highway. The intent of using a narrower lane is to enhance the traffic calming effect and to encourage speeds consistent with the 30 mile per hour posted speed limit. Refer to **Exhibit 3.3.3.2 (1)-1** for a justification of this non-standard feature.

The proposed 11-foot travel lane widths would match the existing lane widths, which are also constrained by median barrier and guiderail with minimal offsets. A 2-foot offset would be provided in the median to minimize the effects of "shying". As described in Exhibit 3.3.3.2 (1) -1 of the FDR/FEIS (Non-Standard Feature Justification), based upon available data from June 2015 to March 2016, since the posted speed limit was reduced to 30 mph and lanes were restriped from 12 feet to 11 feet wide, the average number of accidents experienced per month was similar. The percent of injury accidents dropped from 42% to 27%. No other appreciable change in accident frequency, severity, or costs is anticipated. Retaining the existing non-standard feature would be consistent with the project goals and objectives which seek to change the character of the roadway from an urban expressway to an urban boulevard.

Per NYSDOT design standards, an 11-foot wide lane is allowable for an urban minor arterial with 2% or greater truck traffic. Heavy vehicles, including tractor-trailers, account for between 2% and 5% of peak hour traffic and between 5% and 11% of the daily vehicular traffic volumes. Therefore, 11-foot wide lanes would accommodate nearly 90% of the expected daily motor vehicle traffic while at the same time accommodating truck traffic along NYS Route 198.

Superelevation Rate: The design superelevation rate on NYS Route 198 through the Parkside Avenue intersection would be 1%. This would be less than the required design rate of 3.0% for a horizontal curve with a 1,115-foot radius. The purpose of this feature would be to facilitate the transition from NYS Route 198 to Parkside Avenue without adverse effects to adjacent properties in the Parkside East Historic District. More substantial property acquisitions, excavation, and the installation of a retaining wall affecting community character would be required to fully meet standards. While the standard would not be fully met, the geometry being proposed is an incremental improvement over the flat (0%) condition that exists today. Refer to **Exhibit 3.3.3.2 (1)-2** for a justification of the use of this non-standard feature.

(b) Delaware Avenue Connector

Horizontal Curvature: The Delaware Avenue Connector would include a horizontal curve with a 196-foot radius adjacent to NYS Route 198 (Curve DC-1). This is less than the 250-foot requirement. Expanding the radius would require the acquisition of additional parkland, impact vehicular storage length in the eastbound right turn lane, move the intersection toward the historic Delaware Avenue Bridge, and require the southwestern curb radius to be widened which would extend the length of the pedestrian crossing. The 196-foot radius supports an operating speed of 25 miles per hour which would be compatible with the speed of vehicles turning on to and off of NYS Route 198. There is no through traffic at this location and a through movement is not likely to be added in the future given the presence of Delaware Park and South Meadow Drive immediately to the north. Refer to **Exhibit 3.3.3.2 (1)-3** for further detail regarding the proposed non-standard feature.

(c) Elmwood Avenue Connector

Stopping Sight Distance: The Elmwood Avenue Connector would include a 150-foot long sag vertical curve on the immediate approach to NYS Route 198 which is less than the 200-foot minimum requirement. This curve is required to tie the proposed Elmwood Connector grade into mainline NYS Route 198 before reaching the concrete raised table for constructability reasons. There is no through traffic at this location, the approach would be controlled by a traffic signal, motor vehicles are likely to turn at speeds between 15 and 20 miles per hour to complete a turn movement, and the intersection would have lighting. Refer to **Exhibit 3.3.3.2 (1)-4** for justification of the use of this non-standard feature.

(d) Southern Lincoln Parkway Connector

Superelevation Rate: The design superelevation rate on the southern Lincoln Parkway Connector would be 2%. This would be less than the standard rate of 6%. This feature occurs on an approach to NYS Route 198 that would be controlled by a traffic signal and feature a raised pedestrian crossing. The banking at the end of the connector roadway is required to tie into the mainline of NYS Route 198. Refer to **Exhibit 3.3.3.2. (1)-5** for additional information.

Stopping Sight Distance: The southern Lincoln Parkway Connector would include a 120-foot long sag vertical curve to connect the existing Three Tribes Bridge to NYS Route 198. The profile of the roadway would be constrained by the adjacent topography of Delaware Park and the a need to meet accessibility guidelines at the adjacent proposed raised pedestrian crossing. This approach to NYS Route 198 and the raised crossing would be controlled by a traffic signal. Refer to **Exhibit 3.3.3.2 (1)-6** for justification of the use of this non-standard feature.

(e) Northern Lincoln Parkway Connector

Superelevation Rate: The design superelevation rate on the northern Lincoln Parkway Connector would be 2%. This would be less than the standard rate of 6%. This feature occurs on an approach to NYS Route 198 that would be controlled by a stop sign and would feature a raised pedestrian crossing immediately upstream. Both features would limit motor vehicle speeds. The banking at either end of the connector roadway is required to tie into Nottingham Terrace and the mainline of NYS Route 198. Refer to **Exhibit 3.3.3.2. (1)-7** for additional information.

(f) Delaware Avenue (NYS Route 384)

Horizontal Curvature: Delaware Avenue would include a horizontal curve on the southbound roadway just south of Nottingham Terrace with a radius of 450 feet (Curve DS-3). This is an incremental improvement over the existing curve (427-foot radius) at the same location constructed in 1997. Improving the curve to meet standards would impact the historic bridge downstream. There is no history of accidents associated with this curve and it is necessary to tie in to the existing Nottingham Terrace intersection. Refer to **Exhibit 3.3.3.2 (1)-8** for justification of the use of this non-standard feature.

Superelevation Rate: The design superelevation rate on Delaware Avenue within the project limits would be 2%. This would be less than the standard rate of 4% but match existing conditions. Given the radii along Delaware Avenue the 2% superelevation rate would support a vehicular operating speed of at least 35 miles per hour which exceeds the City of Buffalo's 30 mile per hour speed limit. The cut and fill required to attain a 4% superelevation would impact the foundations of the adjacent historic Delaware Avenue bridge. There is no accident experience associated with the existing non-standard feature. It would be retained in the proposed design. Refer to **Exhibit 3.3.3.2. (1)-9** for additional information.

Stopping Sight Distance: Delaware Avenue would include a pair of sag vertical curves with a stopping sight distance of 245 feet, which is less than the 360-foot requirement for stopping sight distance. Both curves are immediately below the historic bridge and match the existing condition. Improving the curves to meet standards would impact the historic structure by undermining the bridge's foundation or reducing vertical clearance at the bridge. The roadway is lighted at this location, both adjacent to and below the structure. There is no history of accidents associated with this feature. Refer to **Exhibit 3.3.3.2 (1)-10** for justification of the use of this non-standard feature.

Vertical Clearance: The vertical clearance beneath the historic bridge carrying NYS Route 198 over Delaware Avenue is 13 feet. This is one-foot below the minimum vertical clearance of 14 feet required by standards and 1½ feet below the desirable value of 14½ feet. Improving vertical clearance would impact the historic structure's foundations. There is no history of accidents associated with this feature and trucks currently utilize the underpass. The bridge is currently posted at 12 feet–3 inches. Refer to **Exhibit 3.3.3.2 (1)-11** for justification of the use of this non-standard feature.

(g) Agassiz Circle

Horizontal Curvature: Agassiz Circle would be reconstructed to tie into Parkside Avenue at the project work limit. It has an original curvature of 217 feet (Curve HP-1) which is less than today's 250-foot standard. This feature dates back to the original roadway system in and around Delaware Park. Enlarging the curve to meet current standards would alter the historic alignment of Agassiz Circle and bring its intersection with Parkside Avenue closer to NYS Route 198. It would also affect an historic property at 23 Agassiz Circle. Vehicular speeds on this segment of roadway are relatively low given the park surroundings, on-street parking, connecting driveways, and the need to stop before turning right on Parkside Avenue. The curve supports an operating speed of 25 miles per hour which is compatible with the urban surroundings. This existing non-standard feature would be retained by the proposed design. Refer to **Exhibit 3.3.3.2 (1)-12** for additional information.

(h) Humboldt Parkway

Horizontal Curvature: Humboldt Parkway (westbound) would be reconstructed immediately adjacent to NYS Route 198 and Agassiz Circle to tie in at the project work limit. It has an existing curvature of 56 feet at the point where it meets Agassiz Circle (Curve HP-2), which is less than today's 250-foot standard. Enlarging the curve to meet current standards would require the acquisition of up to two residential properties along the north side of Humboldt Parkway. A larger curve would also promote higher operating speeds inconsistent with the urban surroundings, downstream curvature on Agassiz Circle, and downstream stop sign at Parkside Avenue. This existing non-standard feature would be retained by the proposed design. Refer to **Exhibit 3.3.3.2 (1)-13** for additional information.

3.3.3.2. (2) Non-Conforming Features

In addition to the critical design elements contained in Chapter 2 of the NYSDOT HDM, many other design features were taken into consideration during the development of the Build Alternative. Non-critical design elements within the proposed reconstruction limits are presented in **Section 3.2.3.3.** Non-conforming features are design elements that depart from typical design practice, but are not related to designated design criteria. The following is a list of non-conforming features and explanations:

(a) Shared-use Paths

Width: The recommended minimum width for a shared use path is 10 feet with a one-foot clearance to rails or fences. The clear width of the shared use path on the NYS Route 198 bridge over Delaware Avenue between the northern parapet and bridge rail would be 7-feet, eight-inches. This is the maximum width that can be provided while also accommodating a 5-foot wide sidewalk, one 5-foot-wide shoulder in each direction, two 11-foot-wide vehicular travel lanes in each direction, and required railing systems within the existing footprint of the existing historic structures, deck. The 7-foot, eight-inch width represents an incremental improvement over the existing 5-foot width.

Vertical Clearance: The recommended vertical clearance over a shared-use path, to accommodate bicyclists, is 10 feet. The vertical clearance over the Jesse Kregal Pathway beneath the Grant Street Connector would be eight feet. Current data suggest that the ordinary high water elevation of Scajaquada Creek at this location is 575.1 feet. Lowering the path to attain 10 feet of vertical clearance would place the path at an elevation of 573.7 feet, below the ordinary high water elevation, which could subject it to flooding. The design of the path would be revisited during final design, as hydraulic modeling progresses, and if reasonable the vertical clearance would be increased. The existing 9.7 feet of vertical clearance over the Jesse Kregal Pathway beneath the Grant Street Bridge would be retained.

(b) Traffic Operations

Level of Service (LOS): Refer to **Section 2.3.1.7** for description of LOS. There are a small number of lanes and/or intersection approaches within the proposed reconstruction limits where the peak hour design year LOS is projected at E or F. LOS D is generally considered acceptable as an urban, peak hour condition. Peak hour LOS E and F conditions, in specific instances, would be considered acceptable by the NYSDOT in order to meet the Project's Purpose and Need. Refer to **Section 3.3.1.7** for a detailed summary of the affected locations.

(c) Hydraulic Freeboard

Grant Street Connector: The Grant Street Connector would replace the two two-span existing Ramp GE and GF bridges over Scajaquada Creek. The NYSDOT hydraulic design standard is to provide a minimum of two feet of freeboard below the lowest low chord for the 50-year flood event. The actual freeboard values for the existing Grant Street ramp bridges are -3.5 feet (Ramp GE) and -2.3 feet (refer to **Section 3.3.3.7**). The proposed replacement bridge would have a freeboard of -2.7 feet. Although this does not meet the desired standard, it would meet the NYSDOT policy for replacement bridges which is to provide the same or greater waterway opening, and to cause no increase in upstream water surface elevations for the 50-year and 100-year discharges.

Elmwood Avenue Connector: The Elmwood Avenue Connector would replace the existing single span Elmwood Avenue Connector bridge over Scajaquada Creek. The NYSDOT hydraulic design standard is to provide a minimum of two feet of freeboard below the lowest low chord for the 50-year flood event. The actual freeboard value for the existing Elmwood Avenue Connector bridge is 1.33 feet (refer to **Section 3.3.3.7**). The proposed replacement bridge would have a freeboard of 1.33 feet. Although this does not meet the desired standard, it would meet the NYSDOT policy for replacement bridges which is to provide the same or greater waterway opening, as the bridge is longer than the existing, and to cause no increase in upstream water surface elevations for the 50-year and 100-year discharges. Both the 50-year and 100-year water surface elevations are below the low chord of the bridge. Additionally, the bridge is inclined, such that the majority of the bridge does meet the 2 feet freeboard requirement.

(d) Vehicle Turning Paths at Intersections

There are three intersections within the project limits where some but not all radii or approaches would accommodate a tractor trailer (WB -50 or WB-67). These include the Buffalo State College approach to Grant Street, the intersection of Grant Street and the Tops Plaza drive, and the Nottingham Terrace approach to Elmwood Avenue. In each case, the proposed conditions would accommodate at least the same size vehicle as can navigate the turn today. Refer to **Section 3.2.3.3** and the footnotes to **Exhibit 3.2.3.3-4** for additional information. In each case, accommodating a tractor trailer would result in widening of the pavement and have adjacent property impacts.

(e) Intersection Sight Distance

Buffalo State Parks Maintenance Facility Driveway: Vehicles parked in an existing lot facing NYS Route 198 would interfere with intersection sight distance in certain cases. Adequate intersection sight distance would be available for passenger cars making a right turn on red from behind the stop line at the City of Buffalo Park Maintenance Facility. Seven parking spaces would need to be removed in order for single unit trucks (SU-30) to be afforded the same condition. The NYSDOT is currently discussing this issue with the City of Buffalo. Right turn on red restrictions or parking removal would be considered during final design.

(f) Raised Crossings and Intersections

NYS Route 198: The Build Alternative would include raised crosswalks and intersections. New York State's Complete Streets Law, effective in 2012, identified raised crosswalks as one of a number of roadway features that "accommodate and facilitate convenient access and mobility by all users."

Design guidance in NYSDOT Engineering Instruction (EI) 13-018 modifies Chapter 25 of the NYSDOT *Highway Design Manual* and allows raised crossings to be used at crosswalks that have or will have very high pedestrian volumes and where the posted speed limit is 30 miles per hour or less. The Build Alternative would result in eight at-grade opportunities for pedestrians and bicycles to cross NYS Route 198. Based on the limited number of existing crossings and public input indicating a desire for additional crossings, the educational, recreational, cultural, and historic land uses along NYS Route 198 are expected to generate large volumes of crossing pedestrian and bicycle traffic once the roadway has been converted to an urban boulevard. The number and proximity of pedestrian generators and destinations are illustrated on **Exhibit 3.3.2.1 in Appendix A1**. In addition, the existing posted speed limit of 30 miles per hour would remain along NYS Route 198; therefore, this project would satisfy the conditions of EI 13-018 for implementation.

All raised crosswalks and intersections would be designed and constructed in accordance with current NYSDOT standards and guidance regarding length, elevation, and materials. They would accommodate emergency vehicles, transit buses, and plowing operations. In combination with other traffic calming measures, the raised crossings would increase awareness of non-motorized street users, enhance safety and convenience for all users including pedestrians, bicyclists, motorists, and persons with disabilities, encourage vehicular speeds compatible with Delaware Park, and support an overall improvement in the community's quality of life.

3.3.3.3. Pavement and Shoulder

The NYSDOT prepared a *Pavement Evaluation Report* for NYS Route 198 in March 2016 which is included in **Appendix D**. The report recommends cold milling the asphalt surface off of the underlying concrete pavement and rehabilitating the roadway with two inches of binder and 1½ inches of top course asphalt in any areas where there is no change in the existing roadway section or alignment.

The majority of the Build Alternative involves horizontal and vertical alignment changes, along with the installation of new curbing and a raised median, which would require reconstruction of the pavement. In addition, **Section 2.3.3.4** notes that the existing drainage system is nearing the end of its useful life and requires replacement, which would also justify pavement reconstruction.

Hot mix asphalt (HMA) pavement sections were developed using the Equivalent Single Axle Loading (ESAL) pavement design procedure outlined in the NYSDOT *Comprehensive Pavement Design Manual* (CPDM). The expected pavement surface life would be 20 years with an expected total pavement service life of 50 years.

The recommended full depth asphalt pavement section for the reconstruction of NYS Route 198 and the connector roadways is as follows:

- 1.5 in HMA Top Course
- 2.5 in HMA Binder Course
- 5.0 in HMA Base Course
- 12.0 in Granular Subbase Course

The *Pavement Evaluation Report* recommends recycling the existing Portland Cement Concrete (PCC) foundation course for use as subbase. Consideration could be given, during detailed design, to constructing intersection approaches along NYS Route 198 using PCC pavement as an alternative to HMA given that vehicular stops and starts, including those by heavy trucks and buses, are expected to occur frequently.

The Build Alternative would also involve local roadway and intersection reconstruction. Recommended sections are summarized below. Outside the reconstruction limits, local roadways would be milled and resurfaced at the tie in points.

Grant Street, Elmwood Avenue, Iroquois Drive, Nottingham Terrace, and Parkside Avenue:

- 1.5 in HMA Top Course
- 2.0 in HMA Binder Course
- 8.0 in PCC Foundation Pavement
- 12.0 in Granular Subbase Course

The proposed pavement section for these local roadways is based on the City of Buffalo's standard treatment and the section used on the recent Elmwood Avenue Bridge project. Local road sections would be confirmed with the City of Buffalo during final design.

Delaware Avenue:

- 1.5 in HMA Top Course
- 2.0 in HMA Binder Course
- 7.5 in HMA Base Course
- 12.0 in Granular Subbase Course

The Delaware Avenue pavement section is based on information obtained from record plans for the most recent reconstruction project in 1999. Further geotechnical and subsurface information would be obtained during final design along Delaware Avenue to support the pavement design effort. According to record plan information, the existing pavement section consists of an 11-inch HMA section over a 24-inch subbase course. Poor soil conditions or subsurface water issues may exist and need to be addressed.

Raised crossings would be constructed using a minimum of 11 inches of Portland Cement Concrete (PCC) pavement in accordance with the NYSDOT CPDM based on the ESAL pavement design procedure.

3.3.3.4. Drainage Systems

The Build Alternative would change some drainage patterns due to shifts in alignment and/or profile, the construction of new roadways, or the redirection of drainage to stormwater treatment facilities. However, the overall drainage patterns within the project limits would remain unchanged and the current outlet locations described in **Chapter 2** would be retained or slightly adjusted. Existing drainage ditches, pipes, culverts, and structures that would remain but are silted in would be cleaned. Existing pipes and culverts that have reached the end of their service life, are in poor condition, are at elevations and locations different

from the proposed improvements, are undersized, or are needed to carry stormwater to designated treatment locations would be replaced as part of the proposed improvements. The text that follows describes any proposed drainage changes that would occur within the major drainage segments identified in **Chapter 2**.

NYS Route 198 from the elevated viaduct to the NYS Route 198 bridge over Scajaquada Creek (BIN 1039989), just east of Elmwood Avenue

The proposed drainage system in the first portion of this segment (viaduct to Grant Street) would involve new drainage structures, pipes, and outlet pipes because much of this area is proposed to change from drainage flowing in open ditches to drainage contained in a closed drainage system. The new system would direct runoff to various stormwater control features located within the right of way which would tie into an existing system that outlets to Scajaquada Creek just west of the Grant Street bridge. The existing outlet pipe would be replaced with a larger diameter pipe to accommodate the additional discharge. If hydraulic modeling during final design shows that this outlet pipe cannot handle the additional flow, an additional outlet to the creek would be constructed.

The second portion of this segment (Grant Street to the NYS Route 198 bridge over Scajaquada Creek) would retain many of the existing drainage patterns. New structures and drainage pipes are proposed. Drainage would be directed to a series of stormwater features and discharged into Scajaquada Creek.

NYS Route 198 from the bridge over Scajaquada Creek (BIN 1039989) to Delaware Avenue

The proposed drainage system in the first portion of this segment (BIN 1039989 to Lincoln Parkway) would include new drainage structures and outlet pipes that would outlet to Scajaquada Creek. The second portion from Lincoln Parkway to east of Delaware Avenue would include new drainage structures and outlets to stormwater control features. Stormwater facilities would discharge to existing drainage systems, or to adjacent waterbodies. An additional stormwater outlet pipe may be needed to direct discharge into Hoyt Lake.

NYS Route 198 from Delaware Avenue to Parkside Avenue

The proposed system would involve new drainage structures and pipes connecting to the existing closed drainage system. Some portions of this area may connect to stormwater management facilities, which would discharge into Hoyt Lake.

NYS Route 198 from Parkside Avenue to Main Street

The proposed drainage system would involve new drainage structures and pipes connecting to the existing closed drainage system.

Delaware Ave (NYS Route 384)

The proposed drainage system would involve new drainage structures and pipes connecting to the existing closed drainage system.

New drainage systems would be installed along the connector roadways and tie into the existing system as appropriate. Drainage systems along the local street system would be adjusted as necessary to accommodate the changes in the proposed curb lines.

Drainage structures with frames and bicycle friendly reticuline grates would be installed along NYS Route 198. This type of structure would fit within the three-foot curb offset and eliminate the existing curb boxes that become plugged with debris, which has led to localized flooding and ongoing maintenance concerns in the past.

Stormwater pollutant minimization measures would be included as part of the overall drainage system for all stages of work, during construction activities, and for permanent (post-construction) stormwater management as required by the State Pollutant Discharge Elimination System (SPDES) construction general permit. There are locations within the project limits and proposed NYSDOT right-of-way to implement and maintain adequate measures to properly manage stormwater run-off. Refer to **Section 4.4.8** for additional information on proposed stormwater treatment features. The method of treatment and management would be determined during final design.

3.3.3.5. Geotechnical

No special techniques or considerations are anticipated that would affect the project. Rock excavation may be necessary for any large or deep drainage structures to be installed between Delaware Avenue and Parkside Avenue.

The existing bridges within the project limits are supported by deep foundations consisting of steel, timber, or cast-in-place piles. It is expected that piles would be necessary to support new or widened bridges constructed as part of this project. A Foundation Design Report will be developed for each new or widened bridge included in this project to determine the appropriate foundation type.

3.3.3.6. Structures

Refer to **Section 2.3.3.6** for a description of all bridges within the project limits. The disposition of structures under the Build Alternative would be as follows:

- Bridge Identification Number (BIN) 1039910 carrying Grant Street over NYS Route 198 and Scajaquada Creek, would remain.
- BIN 1039940 and BIN 1039930, carrying Ramps GE and GF over Scajaquada Creek would be removed and replaced with a new structure carrying the northern Grant Street Connector.
- BIN 1039959 carrying Ramp EC over Scajaquada Creek would be replaced with a new structure carrying the Elmwood Avenue Connector.
- BIN 1039969 carrying Elmwood Avenue over NYS Route 198 and Scajaquada Creek would remain.
- BIN 1039970, carrying Ramp EK over Scajaquada Creek would be removed.
- BIN 1039989 carrying NYS Route 198 over Scajaquada Creek would be rehabilitated including a deck replacement.
- BIN 2260460 carrying Lincoln Parkway (Ramp LJ) over Scajaquada Creek, (Three Nations Bridge) would remain.
- BIN 1039990, carrying pedestrians over NYS Route 198 would undergo minor concrete repairs and joint repairs.
- BIN 1047259 carrying NYS Route 198 over Delaware Avenue would be rehabilitated to carry the new roadway, sidewalk and shared use path.
- Two new shared-use path structures would be constructed over Scajaquada Creek. One would cross near Buffalo State College and the other near Mirror Lake.

A summary of the proposed changes is available as **Exhibit 3.3.3.6** in **Appendix E**. All new and replacement bridges would be designed in accordance with the *NYSDOT LRFD Bridge Design Specifications* (AASHTO LRFD HL-93 live load and the NYSDOT Design Permit Vehicle). All rehabilitated highway bridges would be designed in accordance with the *NYSDOT Standard Specifications for Highway Bridges* (AASHTO HS-20 live load). However, highway bridges whose superstructures are completely replaced would be designed in accordance with the *NYSDOT LRFD Bridge Design Specifications* (AASHTO LRFD HL-93 live load and the NYSDOT Design Permit Vehicle). Existing substructures to remain

for superstructure replacements would not be upgraded solely to accommodate the higher live loads or AASHTO LRFD. Pedestrian bridges would be designed to carry loads specified in the NYSDOT *LRFD Bridge Design Specifications* and the AASHTO *LRFD Guide Specifications for Design of Pedestrian Bridge*s, *December 2009*. Each structure is discussed in the following text, grouped together by construction stage. Refer to **Appendix A2** for typical bridge plan, profile, and cross-section drawings.

3.3.3.6 (1) Stage 1 – Delaware Avenue to Parkside Avenue

BIN 1047259 - NYS Route 198 over Delaware Avenue

3.3.3.6. (1)-1 Description of Work – Bridge Rehabilitation

(a) Type of bridge, number of spans – The existing bridge consists of a two-span, earth-filled, deck-arch founded on timber piles. The total length of the bridge is 229 feet.

(b) Width of travel lanes, shoulders, and sidewalks – The rehabilitated bridge would carry two 11-foot-wide eastbound lanes and two 11-foot-wide westbound lanes. The bridge would have five-foot-wide shoulders. The existing median barrier would be removed. Existing concrete barriers between the travel lane and sidewalk would be replaced with steel railings. The northern sidewalk would become a 7-foot-eight-inch wide shared-use path. The southern sidewalk would be 5 feet wide.

(c) Utilities carried – The bridge would continue to carry electrical (lighting) utilities. A new fiber optic line would be installed under the southern sidewalk.

3.3.3.6. (1)-2 Clearances (Horizontal and Vertical) – There would be unlimited vertical clearance over the bridge on NYS Route 198. The non-standard vertical clearance of 13 feet under the bridge on Delaware Avenue (NYS Route 384) would remain. This would be less than the minimum standard of 14 ft.

3.3.3.6. (1)-3 Live Load – The bridge would be designed to carry an AASHTO HS-20 live load

3.3.2.6. (1)-4 Associated Work – The existing superstructure and substructure would remain. The asphalt roadway section would be replaced and the existing median barrier removed. Repairs would be made to the arches and a geomembrane installed prior to placing new fill. New railing would be installed between the travel lanes and sidewalk/shared use path.

3.3.3.6. (1)-5 Waterway – Not Applicable

3.3.3.6 (2) Stage 2 – Elmwood Avenue Section

BIN 1039959 - Elmwood Avenue Connector over Scajaquada Creek

3.3.3.6. (2)-1 Description of Work – Bridge Replacement

(a) Type of bridge, number of spans – The new bridge would consist of a single-span, steel, multi-girder superstructure founded on steel piles.

(b) Width of travel lanes, shoulders, and sidewalks – The new bridge would consist of two 11-foot left turn lanes and one 11-foot-wide lane shared by through movements and right turns in the eastbound direction. The westbound direction would consist of one 12-foot left turn lane and one 12-foot right turn lane. The bridge would have a 1-foot exterior eastbound shoulder, a 3-foot exterior westbound shoulder and a 4-foot raised median with one-foot curb offsets. A 13-foot-wide shared-use path would also be constructed adjacent to the eastbound travel lanes. The path would be separated from the travel lanes by a railing. A 10-foot-wide shared-use path would pass below the eastern end of the bridge.

(c) Utilities carried – The replacement bridge would carry electrical (lighting, signal and ITS service) utilities.

3.3.3.6. (2)-2 Clearances (Horizontal and Vertical) – There would be unlimited vertical clearance from the top of the bridge deck. The horizontal clearance would be one-foot from the edge of the travel lanes to the curb in the eastbound direction and three-foot from the edge of the travel lanes to the curb in the westbound direction. Vertical clearance above the shared-use path would be 10 feet. The proposed bridge would maintain the current freeboard of 1'-4" for the 50-year event.

3.3.3.6. (2)-3 Live Load – The bridge will be designed to carry an AASHTO HL-93 and NYSDOT Design Permit Vehicle.

3.3.2.6. (2)-4 Associated Work – A new bridge superstructure and substructure would be constructed. The application of aesthetic treatments would be considered during final design.

3.3.3.6. (2)-5 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required. See **Section 3.3.3.7** for further hydraulic information.

<u>BIN 1039969 - Elmwood Avenue over NYS Route 198 and Scajaquada Creek</u>

3.3.3.6. (2)-6 Description of Work – No bridge modifications are anticipated given final completion of the new structure in Spring 2017. The design of the new bridge was coordinated with the Scajaquada Corridor project.

(a) Type of bridge, number of spans – Two-span steel, multi-girder bridge with composite concrete deck with a skew angle of approximately 33°. The total bridge length is 280 feet. The integral abutments, wing walls and solid pier wall are reinforced cast-in-place concrete founded on bearing piles.

(b) Width of travel lanes, shoulders, and sidewalks – To remain unchanged.

(c) Utilities carried – The bridge would continue to carry water, electrical (lighting), and telephone lines.

3.3.3.6. (2)-7 Clearances (Horizontal and Vertical) – There would be unlimited vertical clearance from the top of the bridge deck. The vertical clearance from NYS Route 198, the Jesse Kregal Pathway, and a proposed shared-use path would meet or exceed those clearances listed in the design criteria. The horizontal clearances on the bridge would not be changed. There would be no change in freeboard for the 50-year event.

3.3.3.6. (2)-8 Live Load – The bridge was designed for an HL-93 Live Load and NYSDOT Design Permit Vehicle.

3.3.2.6. (2)-9 Associated Work – Removal of pier protection in the westbound direction in conjunction with the construction of a shared-use path and a railing to separate that path from NYS Route 198.

3.3.3.6. (2)-10 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No Coast Guard coordination would be required.

BIN 1039970 - Elmwood Avenue (Ramp EK) over Scajaquada Creek)

3.3.3.6. (2)-11 Description of Work – Bridge Removal

(a) Type of bridge, number of spans – Not applicable

(b) Width of travel lanes, shoulders, and sidewalks – Not applicable

(c) Utilities carried – Not applicable

3.3.3.6. (2)-12 Clearances (Horizontal and Vertical) – Not applicable

3.3.3.6. (2)-13 Live Load – Not applicable

3.3.2.6. (2)-14 Associated Work – The existing bridge superstructure and substructure would be removed. The electric (lighting) utilities carried on the existing bridge would be removed.

3.3.3.6. (2)-15 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required.

BIN 1039989 - NYS Route 198 over Scajaquada Creek at Mirror Lake and Hoyt Lake

3.3.3.6. (2)-16 Description of Work – Bridge Rehabilitation

(a) Type of bridge, number of spans – The existing bridge consists of a single-span, steel, multi-girder structure founded on steel piles. The total length of the bridge is 94.5 feet.

(b) Width of travel lanes, shoulders, and sidewalks – The rehabilitated bridge would consist of two 11-foot travel lanes and five-foot-wide shoulders in both the eastbound and westbound directions. There would be a 10-foot-wide (minimum) shared-used path along the north side of the bridge. The eastbound and westbound lanes would be separated by a 4-foot-wide median with two-foot-wide curb offsets.

(c) Utilities carried – The bridge would continue to carry electrical (lighting, signal, and ITS service) utilities.

3.3.3.6. (2)-17 Clearances (Horizontal and Vertical) – There is unlimited vertical clearance from the top of the bridge deck. The horizontal clearance would be five feet from the edge of the travel lanes to the curb. There would be no change in the freeboard for the 50-year event.

3.3.3.6. (2)-18 Live Load – The bridge will be designed to carry an AASHTO HS-20 live load.

3.3.2.6. (2)-19 Associated Work – The existing concrete bridge deck would be removed and replaced. All of the bridge bearings would be replaced. The steel framing would be cleaned and painted. Concrete repairs would be made to the substructure. New railings would be installed.

3.3.3.6. (2)-20 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required.

BIN 1039990 - Pedestrian Bridge over NYS Route 198

3.3.3.6. (2)-21 Description of Work – Bridge Maintenance

(a) Type of bridge, number of spans – The existing bridge consists of 22 approach spans constructed of reinforced concrete. The main span that crosses Route 198 consists of steel girders. The total bridge is 611.9 feet.

(b) Width of travel lanes, shoulders, and sidewalks – The curb to curb width of the bridge is 9.5 feet and would remain unchanged.

(c) Utilities carried – The bridge would continue to carry electrical utilities.

3.3.3.6. (2)-22 Clearances (Horizontal and Vertical) – The minimum vertical clearance under the bridge would be 14 feet. Refer to **Section 3.3.3.2 (1)** for additional information on this non-standard feature.

3.3.3.6. (2)-23 Live Load – The bridge was designed to carry an 85 lb/ft^2 pedestrian load.

3.3.2.6. (2)-24 Associated Work – The rehabilitation would include concrete repairs to the existing piers, joint replacement and localized spot painting.

3.3.3.6. (2)-25 Waterway – Not applicable

<u>BIN 2260460 - Lincoln Parkway over Scajaquada Creek</u>

3.3.3.6. (2)-26 Description of Work – No bridge modifications are planned. This bridge underwent Rehabilitation in 2013.

(a) Type of bridge, number of spans – The existing bridge consists of a three-span, steel, multi-girder structure founded on timber piles. Total bridge length is 107.9 feet.

(b) Width of travel lanes, shoulders, and sidewalks – A new 80-foot-wide concrete deck would be installed to accommodate pedestrians.

(c) Utilities carried – None

3.3.3.6. (2)-27 Clearances (Horizontal and Vertical) – There would be unlimited vertical clearance over from the top of the bridge deck. There would be no change to the freeboard for the 50-year event.

3.3.3.6. (2)-28 Live Load – The bridge would be designed to carry an AASHTO HS-20 live load.

3.3.2.6. (2)-29 Associated Work – No bridge modifications are planned.

3.3.3.6. (2)-30 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required.

<u>Proposed Shared-use-Path Bridge over Scajaquada Creek</u>

3.3.3.6. (2)-31 Description of Work – A new shared-use path bridge in a new location.

(a) Type of bridge, number of spans – The proposed shared-use-path bridge would consist of a single span prefabricated truss structure founded on piles.

(b) Width of travel lanes, shoulders, and sidewalks – The clear width between bridge railings would be 14 feet to accommodate the 10-foot-wide shared-use-path and two-foot offsets to railings.

(c) Utilities carried – Electrical utilities (lighting, ITS, and traffic signal services).

3.3.3.6. (2)-32 Clearances (Horizontal and Vertical) – There would be unlimited vertical clearance over from the top of the bridge deck. A minimum vertical clearance of four feet would be maintained above Scajaquada Creek to allow for travel by canoe and kayak. The proposed bridge would have a freeboard of -2.9 feet for the 50-year event.

3.3.3.6. (2)-33 Live Load – The bridge would be designed to carry a 90 lb/ft^2 pedestrian load or H-10 vehicle load.

3.3.2.6. (2)-34 Associated Work – Construct a single span shared-use path bridge spanning over Scajaquada Creek.

3.3.3.6. (2)-35 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No Coast Guard coordination would be required. **See Section 3.3.3.7** for further hydraulic information.

3.3.3.6 (3) Stage 3 – Grant Street Section

BIN 1039910 - Grant Street over NYS Route 198 and Scajaquada Creek

3.3.3.6. (3)-1 Description of Work – No bridge modifications are anticipated.

(a) Type of bridge, number of spans – This bridge consists of a two-span, steel, multi-girder structure founded on steel piles. The total bridge length equals 261.8 feet.

(b) Width of travel lanes, shoulders, and sidewalks – To remain unchanged.

(c) Utilities carried – The bridge would continue to carry existing utilities.

3.3.3.6. (3)-2 Clearances (Horizontal and Vertical) – There is unlimited vertical clearance from the top of the bridge deck. There would be a 14-foot (minimum) vertical clearance under the bridge on NYS Route 198. The existing 9.7-foot vertical clearance over the Jesse Kregal Pathway would be retained. Refer to **Section 3.3.3.2 (2)** for a discussion of this non-conforming feature.

3.3.3.6. (3)-3 Live Load –The bridge was designed to carry an AASHTO HS-25 live load.

3.3.2.6. (3)-4 Associated Work – Not applicable. A major rehabilitation was completed on the structure in 2003. A fascia panel was repaired in 2016. Work such as cleaning scuppers, resetting curbing and replacing light standards would be done under routine maintenance as a separate action.

3.3.3.6. (3)-5 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required.

Proposed Replacement Bridge (northern Grant Street Connector)

3.3.3.6. (3)-6 Description of Work – New Bridge

(a) Type of bridge, number of spans – The proposed bridge would consist of a single-span, steel, multi-girder structure founded on piles. The bridge girders would be flared to accommodate the geometry of the deck. The total bridge length would be approximately 104 feet.

(b) Width of travel lanes, shoulders, and sidewalks – The new bridge would consist of one 13-foot-wide travel lane in each direction and shoulders with a minimum width of three feet. A striped and raised median varying from 0 to 19 feet wide with a two-foot curb offset (on the bridge) would be constructed. A 10-foot-wide shared-use path would pass underneath the bridge.

(c) Utilities carried – The proposed bridge would carry electrical (lighting) utilities.

3.3.3.6. (3)-7 Clearances (Horizontal and Vertical) – There would be unlimited vertical clearance from the top of the bridge deck. A proposed shared-use path would cross below the bridge with an eight-

foot vertical clearance. **Section 3.3.3.2 (2)** for a discussion of this non-conforming feature. The minimum horizontal clearance would be three feet from the edge of the travel lanes to the curb. The proposed replacement bridge would have a freeboard of -2.7 feet for the 50-year event.

3.3.3.6. (3)-8 Live Load – The bridge would be designed to carry an AASHTO HL-93 and NYSDOT Design Permit Vehicle.

3.3.2.6. (3)-9 Associated Work – A new bridge superstructure and substructure would be constructed at this location. The shared-use path that runs under the bridge would require a large retaining wall on the east side of the bridge and a smaller retaining wall on the west side of the bridge.

3.3.3.6. (3)-10 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required. See **Section 3.3.3.7** for further hydraulic information.

<u>BIN 1039930 – Grant Street (Ramp GF) over Scajaquada Creek</u>

3.3.3.6. (3)-11 Description of Work – Bridge Removal

(a) Type of bridge, number of spans – Not applicable

(b) Width of travel lanes, shoulders, and sidewalks – Not applicable

(c) Utilities carried – Not applicable

3.3.3.6. (3)-12 Clearances (Horizontal and Vertical) – Not applicable

3.3.3.6. (3)-13 Live Load – Not applicable

3.3.2.6. (3)-14 Associated Work – Remove existing superstructure and substructure. The existing electrical (lighting) utility would be removed.

3.3.3.6. (3)-15 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required.

<u>BIN 1039940 – Grant Street (Ramp GE) over Scajaquada Creek</u>

3.3.3.6. (3)-16 Description of Work – Bridge Removal

(a) Type of bridge, number of spans – Not applicable

(b) Width of travel lanes, shoulders, and sidewalks – Not applicable

(c) Utilities carried – Not applicable

3.3.3.6. (3)-17 Clearances (Horizontal and Vertical) – Not applicable

3.3.3.6. (3)-18 Live Load – Not applicable

3.3.2.6. (3)-19 Associated Work – Remove existing superstructure and substructure. The existing electrical (lighting) utility would be removed.

3.3.3.6. (3)-20 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required.

<u>Proposed Shared-Use Path Bridge over Scajaquada Creek</u>

3.3.3.6. (3)-21 Description of Work – A new shared-use path bridge in a new location.

(a) Type of bridge, number of spans – The proposed pedestrian bridge would consist of a single span, prefabricated truss or a steel multi-girder structure founded on piles. A small retaining wall may be needed, extending the east wing wall, depending on grading during the detailed design stage.

(b) Width of travel lanes, shoulders, and sidewalks – The clear width between bridge railings would be 14-feet to accommodate the 10-foot-wide shared-use path with a two-foot offset to the railings.

(c) Utilities carried – Electrical utilities (lighting and traffic signal services).

3.3.3.6. (3)-22 Clearances (Horizontal and Vertical) – There would be a four-foot (minimum) vertical clearance over Scajaquada Creek to allow for travel on Scajaquada Creek by canoe. The proposed bridge would have a freeboard of 1.9 feet for the 50-year event.

3.3.3.6. (3)-23 Live Load –The bridge will be designed to carry a 90 lb/ft^2 pedestrian load or an AASHTO H-10 vehicle load.

3.3.2.6. (3)-24 Associated Work – Construct a single span shared-use path bridge spanning over Scajaquada Creek. Construct a low height (anticipated four-foot maximum) exposed height retaining wall that ties into the proposed southeast wing wall.

3.3.3.6. (3)-25 Waterway – This portion of Scajaquada Creek is a non-navigable waterway. No United States Coast Guard coordination would be required. See **Section 3.3.3.7** for further hydraulic information.

Grant Street Retaining Wall (East)

3.3.3.6. (3)-26 Description of Work – New Retaining Wall

3.3.2.6. (3)-27 Associated Work – Install a 200-foot-long retaining wall along the proposed shared-use path, east of the proposed Grant Street Connector bridge. The maximum exposed wall height would be approximately 8.6 feet high. It is anticipated that the proposed retaining wall would be a concrete cantilever wall founded on spread footings.

3.3.3.7. Hydraulics of Bridges and Culverts

3.3.3.7 (1) Freeboard Analysis

The alignment of Scajaquada Creek would remain unchanged under the Build Alternative. Work in Scajaquada Creek would be limited to the removal of the existing bridges carrying Ramps GF and GE (BIN 1039930 and BIN 1039940), the replacement of Elmwood Avenue Ramp EC (BIN 1039959), and the removal of Elmwood Avenue Ramp EK (BIN 1039970). The Grant Street ramps would be replaced by a single bridge, spanning Scajaquada Creek and the Jesse Kregal Pathway. Ramp EC would be replaced in the same location and on the same alignment by the Elmwood Avenue Connector, however the new bridge would be wider to accommodate multimodal traffic. The abutments would be set outside the existing abutments and the low chord would be similar to the existing bridge low chord to maintain or enlarge the current waterway opening. Additionally, two new shared-use path bridges would be constructed, one near Buffalo State College and the other near Mirror Lake, both spanning Scajaquada Creek.

The NYSDOT *Structures Division Policy for Hydraulic Design* of replacement structures is to design new or replacement highway bridges to pass the Design Flood (Q50) with two feet of freeboard whenever possible, and to convey the Base Flood (Q100) with reduced freeboard. Given site limitations, it is not always possible to achieve this goal in the case of replacement bridges, thus either reduced freeboard or submergence is sometimes allowed. However, the absolute minimum requirement is to assure that

replacement bridges will not raise the water surface profile upstream of the bridge for both the Design (Q50) and the Base Flood (Q100) or make conditions worse than those at the existing bridge. The shared-used path bridges will meet the requirements of the National Flood Insurance Program by not increasing the 100-year base flood elevations (BFE) nor increasing the floodway elevations, discussed further in **Appendix B4.** Proposed highway bridges that do not meet the standard are discussed as non-conforming features in **Section 3.3.3.2**

3.3.3.7 (2) Peak Discharges

Typically, NYSDOT procedure is to review both the Federal Emergency Management Agency (FEMA) effective/proposed discharges and the United Stated Geological Service (USGS) Stream Stats discharges based on regional regression equations. According to USGS Stream Stats, the watershed is currently approximately 95% developed and 44% impervious, which is outside the appropriate usage of regional regression equation analysis alone, thus, regression equation discharges were not pursued. A review was conducted of the discharges reported in the effective (September 26, 2008) and preliminary (December 31, 2009) FEMA Flood Insurance Studies (FIS) for Erie County, the discharges developed by NYSDOT for the Elmwood Avenue Bridge Replacement, and a 1994 Bridge Scour Evaluation Study prepared by Bergmann Associates for the New York State Thruway Authority (NYSTA) I-190 bridge over Scajaquada Creek near the mouth. The I-190 study adjusted the discharges from the WRI 79-83 regional regression equation discharges using the urbanization adjustment provided in WRI 84-4350.

For the preliminary analysis, the Design (Q50) and Base Flood (Q100) discharges used to analyze the replacement bridges will be the FEMA effective discharges. As discussed further in **Appendix B,** since the discharges already appear to be on the high side, and cannot be verified nor discredited, no additional increase due to climate change was included in this analysis. As for the shared-use path bridges, the NYSDOT intends to use as the freeboard standard no increase in the FEMA Base Flood Elevations (BFEs) or the floodway elevations. This provides more than four feet of vertical clearance during normal flow conditions to provide sufficient headroom for kayakers. The bridges over water are categorized as shown in **Exhibit 3.3.3.7 (2)-1**:

Based on a preliminary analysis using a HEC-RAS model developed for the Scajaquada corridor, including the four proposed bridges and the FEMA effective discharges with normal depth downstream boundary conditions, the proposed Elmwood Avenue Connector bridge would meet the two-foot freeboard requirement, but the other three bridges would not. The Grant Street Connector was shown to have a negative freeboard and to overtop along the main section of NYS Route 198. However, the bridge is considered a replacement structure and is anticipated to have to be longer, slightly higher, and narrower than the two bridges it is replacing but have a more hydraulically efficient bridge opening, reducing the risk of overtopping as compared to existing conditions, thus meeting the minimum NYSDOT requirements for a replacement bridge. The depth of overtopping along NYS Route 198 would be reduced under the Build Alternative.

The analysis showed no anticipated increase in the 50-year or 100-year water surface elevations or increase in the floodway elevations as the net result of removing the Elmwood Avenue Ramp EK bridge, replacing the Grant Street Connectors and Elmwood Avenue Connector and constructing the proposed shared-use path bridges.

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Exhibit 3.3.3.7 (2) - 1
Summary of Freeboard for Existing and Proposed Bridges Over Scajaquada Creek

Existing Bridges			Proposed Bridges			Comparison to Standards	
Bridge	**Description**	**Freeboard for Q50 (feet)**	**Bridge**	**Description**	**Freeboard for Q50 (feet)**	**NYSDOT 2 foot Minimum Freeboard Standard on Q50 Met?**	**Alternative Standard Met**
Grant Street Ramps GF and GE	2 narrow bridges spanning water way with central pier	-2.7 (Ramp GF) -3.4 (Ramp GE)	Grant Street Connector	Single girder bridge, no pier, spanning waterway and pathway along right bank, low chord similar to existing	-2.9	N	Same or greater waterway opening. No increase in upstream WSEL for FEMA Effective Q50 and Q100
--	--	--	Buffalo State Shared-use Path Bridge	Single span truss bridge that spans floodway, at grade, connecting NYS Route 198 to pathway on right bank	1.6	N	No Increase in FEMA BFE. No increase in floodway elevation.
Elmwood Avenue Connector (Ramp EB/ED)	Single span bridge, no pier	1.33	Elmwood Avenue Connector	Single span girder with abutments set outside of original abutments, low chord similar to existing, wider to accommodate travel lanes	1.33	N	Same or greater waterway opening. No increase in upstream WSEL for FEMA Effective Q50 and Q100
Elmwood Avenue Connector (Ramp EK)		-2.9	Elmwood Avenue Connector	Steel girder bridge with single pier in water connecting NYS Route 198 west to Elmwood Ave north – to be removed	N/A	N/A	N/A
--	--	--	Mirror Lake Shared-use Path Bridge	Single span truss bridge spanning floodway and connecting NYS Route 198 to path on right bank	-2.4	N	No increase for FEMA BFE. No increase in floodway elevation.

A cursory evaluation of the waterway opening for the highway structures considering Risk Analysis, as described in FHWA *Federal Aid Policy Guide 23 CFR 650, Sub-Part A* has been performed, and would be confirmed during Final Design. The overtopping flood would be identified if it occurs at a recurrence interval of less than 100 years. However, the actual minimum freeboard would be determined during detailed design.

3.3.3.7 (3) Bridge Scour

Evaluating Scour at Bridges (HEC-18) 5th Edition, is the FHWA guidance document for bride scour analysis. *Bridge Scour and Stream Instability Countermeasures* (HEC-23) 3rd Edition is the FHWA guidance document for the design of bridge scour countermeasures. New or replacement highway bridges over water within the project corridor would be designed in such a manner as to resist the estimated scour for the high risk flood events. Evaluation of the NYSDOT 100-year, 500-year and overtopping events, as necessary, would be made to determine the most scour critical condition. The highway bridge foundations would need to be stable during the passage of the most scour critical event. If the design is limited in such a way that this cannot be achieved, or the overall potential for frequent scour is substantial, additional scour countermeasures may be necessary to minimize the potential for future scour. Detailed modelling would be conducted by the NYSDOT during detailed design. No substantial changes in the bed elevation or incidents of scour have been reported at the highway bridges within the project corridor. Design of the shared-use path bridge foundations could be based on the loads and soils conditions and then supplemented with scour countermeasures. This means, for example, that if these single span bridge foundations could be designed with spread footings, then scour countermeasures in the form of riprap designed in accordance with HEC-23 could be implemented to assure protection of the foundations of the bridge to resist scour. Such a design would not be appropriate for bridges that carry highway traffic

3.3.3.8. Guide Railing, Median Barriers and Impact Attenuators

All guiderail within the project limits would be evaluated during final design for conformance to design standards and replaced or repaired, if necessary.

Several different barrier treatments are under consideration for use along NYS Route 198 in reconstruction areas. A concept plan showing their approximate location is included as **Exhibit 3.3.3.8** in **Appendix A1** and each type of barrier under consideration is listed below. Final barrier locations and treatments, based on both need and aesthetics, would be determined during final design.

- Standard box beam guiderail, both galvanized and custom painted
- Steel-backed timber guiderail (currently used along NYS Route 198 within Delaware Park)
- Custom painted bicycle-safe bridge rail
- Low-profile concrete barrier (similar to a treatment used on NYS Route 9A in New York City)

The existing median barrier would be removed and replaced with low-profile concrete barrier. No impact attenuators would be required.

3.3.3.9. Utilities

Exhibit 3.3.3.9 identifies public and privately owned utilities that may be impacted by construction. For facilities not impacted by construction, private utility owners may elect to improve their facilities with their own resources in advance of or during the construction phase. Owners of municipal utilities (sanitary sewer and water) may also have a need or desire to upgrade their facilities by installing new or larger mains within areas impacted by construction. These upgrades could be performed as part of the project work as a betterment funded by the owner of the utility.

Impacts to existing highway lighting are excluded from **Exhibit 3.3.3.9** as they are discussed in **Section 3.3.1.11**. Impacts associated with the proposed underground drainage system would be determined during final design.

Exhibit 3.3.3.9
Location of Potential Utility Impacts[1]

Owner	Type (OH/UG)	UIR Ref No.	Location	Impact
City of Buffalo	Fire Alarm (UG)	1A	Grant Street (Approx. Sta G 21+00 to Sta G 25+00, RT)	Relocate 2-4 inch fire conduits and cable in conflict with curb line, intersection, and drainage
City of Buffalo	Fire Alarm (UG)	1A	Elmwood Avenue (Approx. Sta E 22+00 to Sta E 23+50, RT)	Relocate fire conduits, call box, and cable in conflict with curb line, intersection, and drainage
City of Buffalo	Fire Alarm (UG)	1A	NYS Route 198 (Approx. Sta ML 90+00, LT)	Relocate fire conduits and cable in conflict with curb line, roadway, and drainage (if necessary)
Verizon	Telephone (UG)	3B	Elmwood Avenue (Approx. Sta E 22+00 to Sta E 23+50, RT)	Relocate conduit duct and cable in conflict with curb line, intersection, and drainage
Verizon	Telephone (UG)	3B	NYS Route 198 Crossing (Approx. Sta ML 61+50)	Relocate conduit duct and cable in conflict with curb line, roadway, and drainage
Verizon	Telephone (UG)	3B	NYS Route 198 Crossing (Approx. Sta ML 95+80)	Relocate conduit duct and cable in conflict with curb line, roadway, and drainage
National Grid	Electric (UG)	4A	South Meadow Drive (Approx. Sta. SM 24+50 LT)	Relocate transformer #178 in conflict with curb line and roadway
National Fuel	Gas Main (UG)	6B	Grant St. Connector to WB NYS Route 198 (Approx. Sta GN 16+00 to Sta GN 17+50, RT)	Relocate 12-inch-high pressure gas main away from the proposed bridge
National Fuel	Gas Main (UG)	6B	Nottingham Terrace / Delaware Avenue intersection – Northeast corner	Protect/lower/relocate 3-inch gas main (if necessary)
National Fuel	Gas Main (UG)	6B	NYS Route 198/Parkside Ave. intersection – Crossings at NY Route 198 & Parkside Ave. including under Delaware Park Entrance (Approx. Crossing Sta WB 209+00 and Sta P 11+85)	Lower or relocate 4-inch gas main
National Fuel	Gas Main (UG)	6B	NYS Route 198/Parkside Ave. intersection – Northeast side of NY Route 198 & Humboldt Parkway (Approx. Sta HP 12+50, LT)	Protect/lower/relocate 4-inch gas main (if necessary)
City of Buffalo	Water Main (UG)	7A	Grant Street (Approx. Sta G 20+00 to Sta G 22+00)	Spot relocate 10-inch water main (if necessary) to avoid conflicts with proposed signals and drainage

Exhibit 3.3.3.9 Location of Potential Utility Impacts[1]				
City of Buffalo	Water Main (UG)	7A	Elmwood Avenue and Nottingham Terrace intersection, east side (Approx. Sta. E 21+75 to Sta. E 23+75)	Relocate 16-inch water main
City of Buffalo	Water Main (UG)	7A	Delaware Avenue and Delaware Avenue Connector Intersection and Nottingham Terrace Intersection, east leg (Approx. Sta NB 15+00 to NB 17+00, RT, and Sta. NB 24+00 to Sta. NB 24+50, RT)	Relocate (lower) 20-inch water main
City of Buffalo	Water Main (UG)	7A	South Meadow Drive (Approx. Sta. SM 47+00, LT)	Relocate existing hydrant
City of Buffalo	Water Main (UG)	7A	Crossing of NYS Route 198, West of Parkside Ave (Approx. Sta WB 208+60 and Sta. P 12+30)	Lower or encase 8-inch water main
City of Buffalo	Combined Sanitary Sewer (UG)	8A	Corner of Nottingham Terrace and driveway from the Buffalo History Museum	Adjust manhole top of grate and/or sewer main location (if necessary)

Notes to Exhibit 3.3.3.9:
1. Does not include minor impacts associated with proposed profile changes (i.e. valve box and manhole frame and grate adjustments).
2. No information available at this time for Time Warner Cable TV.
3. Additional survey and utility location required during detailed design to further determine potential project impacts

3.3.3.10. Railroad Facilities

As indicated in **Section 2.3.3.10**, there are no railroads within the project limits and no at-grade crossings within one mile of the project that would impact traffic conditions.

3.3.4. Landscape and Environmental Enhancements

Refer to **Chapter 4** for additional discussion of visual impacts of the Build Alternative.

3.3.4.1. Landscape Development and Other Aesthetics Improvements

The Build Alternative would contain design features aimed at transforming the functional and visual characteristics of the project corridor. This section focuses on the landscape and other proposed aesthetic improvements.

Plantings would be installed throughout the corridor to complement the project setting. Native plants and those tolerant of a roadside environment would be utilized wherever possible. Existing vegetation to remain within the reconstruction limits would be protected using proper care and protection details. The project would incorporate the use of soil erosion control measures, including temporary and permanent seeding and mulch as needed. Turf would be established in areas where pavement is removed, particularly in ramp removal areas where embankments would be stripped down to expose native soils, replicating the topography prior to expressway construction to the greatest extent practical with new topsoil applied to the appropriate depth. Context sensitive elements would feature prominently throughout the corridor.

The Build Alternative would convert the Scajaquada Expressway into an urban boulevard, consistent with the project's purpose and objectives. Key landscape and aesthetic elements of the Build Alternative would include:

- A raised median separating two lanes of traffic in each direction. The median would include a colored and textured low-profile concrete barrier.
- Removal of grade separated interchanges (ramps) and their replacement with at-grade signalized intersections at Delaware Avenue and Elmwood Avenue and a roundabout at Grant Street.
- Addition of ornamental light poles in the Buffalo Olmsted style along the length of the corridor.
- Landscaping within widened portions of the new median and along the edge of the roadway, especially in areas of cut for slope stabilization and as a buffer adjacent to Delaware Park and Forest Lawn Cemetery.
- Installation of gateway elements. The final type, look and location of these features would be coordinated during final design in conjunction with the City of Buffalo, Buffalo Olmsted Parks Conservancy, and the community.
- A modern roundabout at the western end of the corridor that will act as a gateway.
- New recreational shared-use path and footpath connections providing a more consistent, continuous, and integrated pedestrian and bicyclist network along the corridor. The alignment of these paths would follow those of historic paths where practical within Delaware Park.
- Ornamental (e.g. stone, earthen berm, landscaping) treatments on the non-vehicular side of barriers such as the low profile concrete barrier.

These improvements would change the character of NYS Route 198 from an urban expressway to an urban boulevard. The center median would perceptually narrow the pavement and provide a sense of enclosure in areas where trees can be accommodated. Median landscaping would also screen views of the opposing travel lanes, helping to reduce the roadway's visual dominance, primarily near intersections. Ornamental lighting would primarily be installed within the center median, further reinforcing the boulevard character and working with other traffic calming features to encourage adherence to the 30 mile per hour posted speed limit. As previously noted, the ornamental poles and luminaires would be consistent with lighting used on wider Olmsted parkways throughout the City of Buffalo. Pedestrian scale lighting, where used, would be consistent with lighting in and around Delaware Park. The proposed median and median planting plans would be reviewed with appropriate agencies and stakeholders during final design and refinements may be made to the design at that time.

Gateway elements would be located within the project corridor to signal all users that they are within a zone of cultural, recreational, and historic significance. Gateway design would complement the adjacent landscape and be made of materials with textures compatible with the architecture of Delaware Park.

3.3.4.2. Environmental Enhancements

The conversion of NYS Route 198 from an urban expressway to an urban boulevard constitutes an enhancement that would make the roadway more compatible with its surroundings. The Build Alternative would improve pedestrian and bicycle connectivity throughout the project limits. The addition of trees and other landscaping would improve aesthetics, especially within Delaware Park. Furthermore, the Build Alternative would reduce the overall impervious area along the corridor by 3.4 acres. Other specific enhancements would include:

- Construction of two new shared-use path bridges over NYS Route 198 and Scajaquada Creek near Buffalo State College and Mirror Lake;
- Construction of a bicycle and pedestrian "bypass" of the Japanese Gardens;
- Relocation of the sculpture titled "Spirit of Womanhood" to a prominent, accessible location;
- Construction of new access to the McMillan Monument;

- The introduction of curvature along NYS Route 198, just west of Delaware Avenue interpreting the historic alignment of the Delaware Park Bridle Path; and
- Colored and textured concrete surface treatments along the corridor that complement the existing surroundings.

3.3.5. Miscellaneous

3.3.5.1 NYS Smart Growth Public Infrastructure Policy Act (SGPIPA)

Pursuant to Environmental Conservation Law (ECL) Article 6, this project is compliant with the New York State Smart Growth Public Infrastructure Policy Act (SGPIPA). The Smart Growth Screening Tool was used to assess the project's consistency and alignment with relevant Smart Growth criteria (included in **Appendix B1)**. To the extent practicable, this project has met the relevant criteria as described in ECL § 6-0107.

3.3.5.2 Complete Streets Policies

The New York State "Complete Streets Act" requires all state, county, and local agencies including the NYSDOT to consider the convenience and mobility of all users when developing transportation projects that receive federal and state funding. The improvements proposed under the Build Alternative are consistent with this policy. A Capital Projects Complete Streets Checklist is available in **Appendix C1**. The proposed improvements are also consistent with the City of Buffalo's Complete Streets Policy.

TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT / FINAL 4(f) EVALUATION

CHAPTER 4
Social, Economic and Environmental Conditions and Consequences

November 2017

PIN 5470.22
NYS Route 198 (Scajaquada Expressway) Corridor
Grant Street Interchange to Parkside Avenue Intersection
City of Buffalo
Erie County

NEW YORK STATE OF OPPORTUNITY. Department of Transportation
ANDREW M. CUOMO Governor
CATHY CALHOUN Acting Commissioner

U.S. Department of Transportation
Federal Highway Administration

CHAPTER 4 - SOCIAL, ECONOMIC and ENVIRONMENTAL CONDITIONS and CONSEQUENCES

4.1 Introduction

4.1.1 Environmental Classification

This Final Environmental Impact Statement (FEIS) for the Scajaquada Corridor Project ("the project") was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) (23 CFR 771) and the New York State Environmental Quality Review Act (SEQRA) (17 NYCRR Part 15). With respect to NEPA, the project is classified as a Class I project requiring an Environmental Impact Statement (EIS). The Federal Highway Administration (FHWA) is the Federal Lead Agency and the New York State Department of Transportation (NYSDOT) is the Joint Lead Agency for this action.

Under SEQRA, the project is a non-Type II Action, indicating that it has the potential for significant environmental impacts or substantial controversy on environmental grounds. In accordance with 17 NYCRR Part 15, given that a federal EIS is being prepared, NYSDOT and other New York State agencies undertaking a discretionary action for this project have no obligation to prepare an additional EIS under SEQRA. NYSDOT will give full consideration to the federal Final EIS and prepare a Record of Decision in accordance with Section 15.9 of 17 NYCRR Part 15.

4.1.2 Coordination with Agencies

A Cooperating Agency, according to Council on Environmental Quality (CEQ) regulations (40 CFR §1508.5), means any federal agency, other than a Lead Agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. A state or local agency of similar qualifications or, when the project effects are on lands of tribal interest, federally recognized Native American tribes may, by agreement with the lead agencies, also become a Cooperating Agency. CEQ regulations (40 CFR §1501.6) also state that an agency may request the Lead Agency to designate it as a Cooperating Agency.

The following agencies were invited to serve as Cooperating Agencies for this project:

- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (USEPA)
- U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS)
- U.S. Department of the Interior, National Park Service (NPS)
- NYS Department of Environmental Conservation (NYSDEC)
- NYS Office of Parks, Recreation and Historic Preservation (OPRHP): State Historic Preservation Office (SHPO)
- NYS Office of Parks, Recreation and Historic Preservation: State Parks
- NYS Department of State (NYSDOS)

Participating Agencies are those federal, state, or local agencies or federally recognized Native American Nations with an interest in the project. The following agencies were invited to serve as Participating Agencies on the project:

- City of Buffalo
- Greater Buffalo-Niagara Regional Transportation Council (GBNRTC)
- Niagara Frontier Transportation Authority (NFTA)
- New York State Thruway Authority (NYSTA)
- Erie County
- Erie County Soil and Water Conservation District

Cooperating and Participating Agencies are responsible for identifying, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval. Monthly conference calls to discuss the project have been held with the Cooperating Agencies since June 2016. Individual topic-specific meetings have also been held with the Cooperating and Participating Agencies as needed.

A Coordination Plan, which was prepared to facilitate and document the lead agencies' structured interaction with the public and other agencies and to inform the public and other agencies of how the coordination will be accomplished. The Coordination Plan is located in **Appendix B2**.

4.2 Social

The study area for the assessment of social effects includes the neighborhoods that could experience potential adverse impacts from traffic diversions to roadways running roughly parallel to the project corridor, including Hertel Avenue to the north, and West Ferry Street to the south (see **Sections 2.3.1.7.(1), 3.3.1.6** and **3.3.1.7**). The study area neighborhood boundaries correlate with those utilized by the City of Buffalo for planning purposes, and include 18 individual census tracts with a total population of approximately 37,000 as of 2010. The study area includes slightly greater than six square miles of neighborhoods surrounding NYS Route 198 (Scajaquada Expressway). The study area extends eastward past Main Street to the border of NY Route 33, north of Hertel Avenue from Tacoma Avenue to Kenmore Avenue, south along Forest Avenue to E. Ferry Street, and Route 256 on the western side of the study area (see **Exhibit 4.2-1** in **Appendix B1**).

The study area includes Buffalo State College, Medaille College, and Canisius College with a total combined enrollment of nearly 18,000 students. The study area is also home to the Richardson-Olmsted Complex, which has recently undergone an extensive restoration by the Richardson Center Corporation. Construction was completed in March 2017 and the complex now includes the Hotel Henry Urban Resort and Conference Center and the Buffalo Architecture Center (see **Section 2.2.1.2**).

4.2.1 Land Use

EXISTING CONDITIONS

The study area encompasses approximately 10,808 parcels, which account for 3,091 acres (See **Exhibit 4.2.1-1** in **Appendix B1**). **Exhibit 4.2.1-2** provides a summary of the land uses within the study area based on data from the New York State Office of Real Property Tax Services Classification System. Residential land use accounts for 36 percent of the study area. The second largest land use is community services, encompassing 24 percent of the total land area. This is followed by commercial (14 percent), and conservation lands and public parks, which account for eight percent of the total area.

Residential land uses dominate the Parkside, North Park, Starin Central, Albright and Hamlin Park neighborhoods, whereas the Black Rock, Military, North Delaware, and W. Forest neighborhoods contain a greater percentage of mixed residential, commercial and industrial properties. Commercial and industrial uses are concentrated along primary transportation corridors, including Main Street (NYS Route 5), Amherst Street, Elmwood Avenue, Delaware Avenue (NYS Route 384), Tonawanda Street and Niagara Street. However, the largest area of commercial/industrial uses is the Pierce Arrow Commerce Park located along the northern study area boundary between Delaware and Elmwood Avenues, which includes over one million square feet of warehouse and flex industrial space. Buffalo State College, Medaille College and Canisius College are major institutional uses located on approximately 150 acres adjacent to the roadway corridor and are generators and receptors of vehicular and pedestrian activity. The Scajaquada Expressway has few properties with direct frontage; approximately 50 percent of the project corridor travels through Delaware Park.

Exhibit 4.2.1-2
Land Use Classification

Property Classification Code	Land Use	Acres	Percent of Total Area	No. of Parcels
200	Total Residential	1117	36	8,731
300	Vacant Land	229	7	886
400	Commercial	427	14	869
500	Recreation & Entertainment	38	1	18
600	Community Services	728	24	111
700	Industrial	72	2	45
800	Public Services	30	1	31
900	Conservation Lands / Parks	237	8	10
--	No Data	213	7	107
TOTAL		**3,091**	**100**	**10,808**

Source: New York State Office of Real Property Tax Services Classification System (2013)

4.2.1.1 Demographics and Population

Population

The project corridor travels through a cross-section of 16 neighborhoods (study area) (see **Exhibit 4.2-1** in **Appendix B1**). Overall, the study area is comprised of families, young professionals, seniors, and students, representing a range of ages, races, and incomes, as indicated in **Exhibits 4.2.1.1-2** through **4.2.1.1-4**. The north side of the study area contains several affluent neighborhoods that are largely characterized by higher incomes and single-family homes. Several lower income neighborhoods directly border these communities, which are characterized by higher density single-, two-, and multi-family residential units, as well as low- and medium-income households. The diversity of the study area is also influenced by the interdependent colleges and institutions within the study area with thousands of students who live, work, study and recreate in the study area.

As of the 2010 Census, both the City and County population decreased between 2000 and 2010 (see **Exhibit 4.2.1.1-1**). The population within the study area increased from 2000 to 2010.

Exhibit 4.2.1.1-1
Population, 2000 - 2010

	2000	2010	% Change (2000-2010)
Study Area	***29,933[1]***	***37,833***	***26.3%***
City of Buffalo	292,648	261,310	(10.7%)
Erie County	950,265	919,040	(3.2%)

1 Population data for Census Tracts 168, 169, and 171 are not available for the 2000 Census.

Source: American Community Survey (2000, 2010)

Age

The median age of residents in the study area (30 years of age) is younger than the median age of residents in both the City of Buffalo and Erie County. The median age of the residents in the study area is likely due to higher than average levels of college-aged persons and young professionals; the three colleges provide a large influx of 20-34-year-old students seeking rental housing. The study area has a lower percentage of primary- and secondary-school-aged children than the City of Buffalo and Erie County. The study area has a smaller population above the age of 65 years than the City of Buffalo and Erie County (see **Exhibit 4.2.1.1-2**).

Exhibit 4.2.1.1-2 Population by Age, 2010				
	Under 18 yrs	**18 to 64 yrs**	**65 yrs and over**	**Median Age (yrs)**
Study Area	***18.3%***	***72.4%***	***9.3%***	***30.4***
City of Buffalo	23.6%	65%	11.4%	33.2
Erie County	21.6%	62.7%	15.7%	40.4

Source: 2010 U.S. Census

Income

In 2010, study area households generated greater income than the City of Buffalo as a whole, with 13 of the 18 neighborhoods experiencing higher median household incomes than the City of Buffalo median income of $30,043 (See **Exhibit 4.2.1.1-3**). Two neighborhoods (Albright and Starin Central) had median household incomes higher than the 2010 County median of $51,050. Portions of the North Park, Parkside, Delaware Park and Park Meadow neighborhood also had median household incomes higher than the City and County. The Starin Central neighborhood has a median household income greater than $100,000, while the northern portion of the Park Meadow neighborhood (Census Block Group 3) has a median household income of $94,219. In contrast, a portion of the Black Rock neighborhood located north of the Scajaquada Expressway has the lowest household median income in the study area of $9,767. Poverty rates within the study area are below City-wide levels, yet still greater than Erie County in 2010.

Exhibit 4.2.1.1-3 Median Household Income, 2010			
Neighborhood	**Census Tract**	**Geographic Unit**	**Median Household Income ($)**
City of Buffalo	**-**	**-**	**30,043**
Erie County	**-**	**-**	**51,050**
Leroy	40.01	Block Group 4	25694
		Block Group 5	27226
Starin Central	45	Block Group 4	106111
North Park	48	Block Group 1	79340
		Block Group 2	58750
North Park	49	Block Group 5	47438
		Block Group 2	60493
		Block Group 3	42500
		Block Group 4	58015
North Delaware	50	Block Group 1	32222
		Block Group 2	41111
		Block Group 3	45469
North Park	51	Block Group 4	51420
Parkside	52.01	Block Group 1	61450
		Block Group 2	59265
		Block Group 3	58859
		Block Group 4	42083
Hamlin Park	52.02	Block Group 1	33777
		Block Group 2	31250
Delaware Park	53	Block Group 1	62000
		Block Group 2	11373
Park Meadow	54	Block Group 1	48992
		Block Group 4	58984
		Block Group 3	94219
		Block Group 2	34625
Black Rock	55	Block Group 1	33793
		Block Group 2	24727
		Block Group 3	9767
		Block Group 4	35000
Military	56	Block Group 3	30972
Buffalo State	62.01	Block Group 1	0
Forest	63.01	Block Group 1	52155
Albright	63.02	Block Group 1	85556
		Block Group 2	69688
		Block Group 3	66339
Cold Spring	168	Block Group 3	20144
Delaware W. Ferry	169	Block Group 4	28021
Forest	171	Block Group 5	35162

Source: 2010 American Community Survey 5-Year Estimates

Housing

As of 2010, there were over 13,000 housing units within the study area, representing approximately 10 percent of the total City of Buffalo housing units. The study area mirrors the housing diversity found

throughout the City of Buffalo, with more than half of all housing units as rentals and approximately one third owner-occupied units. The vacancy rate within the study area is below the rate experienced Citywide, although pockets of vacancies are higher than the Citywide rate in the Hamlin Park and Forest neighborhoods (see **Exhibit 4.2.1.1-4**). The four neighborhoods directly adjacent to Delaware Park and the Scajaquada Expressway (Parkside, Park Meadow, Albright, and Delaware Park) have historically been the center of wealth throughout Buffalo's history. Their location, within close proximity to Delaware Park, has made these neighborhoods highly sought-after, which historically led to the construction of some of the largest private homes within the City of Buffalo. The study area has maintained high property values in comparison to the City of Buffalo as a whole (see **Exhibit 4.2.1.1-5**).

Exhibit 4.2.1.1-4
Housing by Occupancy and Tenure, 2010

	Total Housing Units	Percent Vacant	Percent Owner-Occupied	Percent Renter-Occupied
Study Area	***13,015***	***13***	***34***	***53***
City of Buffalo	133,444	16	34	50
Erie County	420,537	9	60	31

Source: 2010 U.S. Census

Exhibit 4.2.1.1-5
Median Housing Value, 2010

	Median Housing Value
Study Area	***$130,000***
City of Buffalo	$66,000
New York State	$304,000

Source: 2010 U.S. Census

4.2.1.2 Comprehensive Plans and Zoning

Queen City in the 21st Century: Buffalo Comprehensive Plan

The most recent City of Buffalo Comprehensive Plan was adopted in 2006 and establishes a vision for the City in 2030 based on sustainable development, smart growth principles and the leveraging of current assets (see **Section 2.2.1.1**). The Olmsted Park and Parkway System is a network of interconnected neighborhood parks, parkways, boulevards, and avenues that further incorporate residential squares, circles, and landscaped central areas. Envisioned and designed by Frederick Law Olmsted between 1868 and 1915, the Olmsted Park and Parkway System is described as a substantial City-wide asset in the Comprehensive Plan, and activities associated with the maintenance, restoration and reinvestment in these public infrastructures are a key principle outlined in the document. Further, the Comprehensive Plan identifies the restoration of the Olmsted Park and Parkway System (Scajaquada Expressway included) as a development priority, stating the "elements of this urban structure should be preserved, restored, expanded and reconnected as a central task in the revitalization of Buffalo."

Buffalo Green Code

The City of Buffalo's current zoning ordinance dates back to 1953, with a myriad of changes, additions and modifications since that time. The 2006 Comprehensive Plan recommended a complete overhaul of the zoning ordinance to reflect the key principles and development priorities of the 2030 vision plan. As a result, the City of Buffalo developed a new set of land use regulations in 2010 known as the Buffalo Green Code. The Buffalo Green Code is a place-based economic development strategy that is designed to support and implement the Comprehensive Plan as well as provide the necessary update to the City of Buffalo's current zoning ordinance. Components of the Green Plan include the City of Buffalo's first land use plan (2011), Unified Development Ordinance (zoning), Local Waterfront Revitalization Plan (2014), Brownfield Opportunity Areas, Urban Renewal Plans, and Generic Environmental Impact Statement.

The proposed Unified Development Ordinance provides a new framework for zoning within the City of Buffalo. The updated code proposes three types of zones within the City of Buffalo: Neighborhood Zones, District Zones, and Corridor Zones. Within each zone is a number of specific zones/districts that regulate the land use. A Draft Generic Environmental Impact Statement (DGEIS) was accepted by the Common Council and a formal public comment period was held between February and April of 2016, with subsequent revisions to the document. The Final Generic Environmental Impact Statement (FGEIS) was prepared and filed with the Common Council, and a revised Unified Development Ordinance was filed on September 15 2016. After public hearings and meetings, the code was adopted by the Buffalo Common Council on January 3, 2017.

The Scajaquada Corridor and adjacent Delaware Park are proposed to be included in the District - Green Zone (D-OG), which is intended to address civic greens and parks characterized primarily by trees and landscape, framed by landscape elements or building facades, and designed for passive or recreational use. The future land use patterns of surrounding neighborhoods are anticipated to remain largely unchanged and include single-family residential, residential, mixed-use, and campus zones. The Study Area is comprised of the following 16 zones as proposed in the Unified Development Ordinance:

- Neighborhood Zones
  - Urban Core – Secondary Employment Center (N-1S)
  - Urban Center – Mixed-Use Center (N-2C)
  - Urban Center – Mixed-Use Edge (N-2E)
  - Urban Center – Residential (N-2R)
  - Urban Neighborhood – Mixed-Use Center (N-3C)
  - Urban Neighborhood – Mixed-Use Edge (N-3E)
  - Urban Neighborhood – Residential (N-3R)
  - Urban Edge – Single Family (N-4 30)
  - Urban Edge – Single Family (N-4 50)

- District Zones
  - Open Space – Green (D-OG)
  - Educational Campus (D-E)
  - Medical Campus (D-M)
  - Employment – Retail Strip (D-S)
  - Employment – Flex Commercial (D-C)
  - Employment – Light Industrial (D-IL)

- Corridor Zones
  - Metro Rail

Buffalo Olmsted Parks Conservancy Master Plan

The Buffalo Olmsted Parks Conservancy is a non-profit corporation charged with the protection, preservation, maintenance and operations of the City of Buffalo's Olmsted Parks and Parkway System, including Delaware Park (**see Section 4.4.12**). The 2008 Buffalo Olmsted Parks Conservancy Master Plan identified a series of individual projects for Delaware Park, specifically highlighting the upgrade[1] of the Scajaquada Expressway to a parkway to reconnect the fragmented northern and southern portions of the park. Additional projects identified in the Master Plan include traffic calming measures at park roads, and appropriate wayfinding and branding signage.

Long-Range Transportation Planning

The Greater Buffalo-Niagara Transportation Council, the Metropolitan Planning Organization (MPO) for Erie and Niagara Counties, is responsible for the oversight and administration of the Transportation Improvement Program (TIP) and 2035 Long-Range Transportation Plan, which includes an assessment

[1] The plan uses the term "upgrade" to refer to the conversion of the expressway into a "parkway," or a "boulevard." This document refers to this conversion as a "downgrade" Because the highway classification will be lowered.

of existing conditions and on-going long range planning activities. As noted in Section 2.2.1, the NYS Route 198 (Scajaquada Corridor) Project, Phase I, PIN 5470.22 is recognized on the current TIP.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would involve relatively minor changes to the overall land use pattern in the study area. One change would be in the adjustment between the use of land for transportation and the use of land for parkland. This is discussed in more detail in **Section 4.4.12**, which documents how the Build Alternative would require less acreage than the existing, resulting in a net increase in parkland of 3.5 acres.

The Build Alternative would include the reconstruction of the Scajaquada Expressway to better emulate the former Humboldt Parkway alignment and improve connectivity between both sections of Delaware Park on either side of the roadway and between the park and adjacent neighborhoods, which directly correlates to the Key Principles and Development Priorities outlined in the City of Buffalo's Comprehensive Plan and is reflected in the proposed zoning for the City of Buffalo. The Build Alternative is consistent with applicable state, regional, and local land use, recreation and transportation plans for the study area.

4.2.2 Neighborhoods and Community Cohesion

EXISTING CONDITIONS

The neighborhoods and community characteristics within the study area are described in **Section 4.2.1**. Currently, the existing expressway divides Delaware Park and the neighborhoods to the north and south of the corridor. There is limited connectivity between neighborhoods on either side of the corridor (see also **Section 2.2.2.3**) and the only crossings for pedestrians and bicyclists are located at:

- Parkside Avenue
- Delaware Avenue
- Pedestrian overpass near Lincoln Parkway
- Elmwood Avenue
- Grant Street

The study area is comprised of a range of recreation, historic, and cultural facilities that directly contribute to the overall quality of life for residents, visitors, and students. In addition to natural areas, including Delaware Park and the Jesse Kregal Pathway, the Buffalo Zoo, located on the north side of Delaware Park, provides education and recreation resources for all ages. The Delaware Park Golf Course is an 18-hole public course located on Parkside Avenue within the Park.

East of Delaware Park on Jewett Parkway is Frank Lloyd Wright's Martin House Complex. Designated as a National Historic Landmark in 1986, the house is considered as one of Wright's finest achievements of the Prairie period and his career. The complex consists of six interconnected buildings that are undergoing extensive renovations following decades of damage and neglect.

Located west of the Martin House on the north of the Scajaquada Expressway, the Buffalo History Museum overlooks Mirror Lake and the Jesse Kregal Pathway. Founded in 1862, the museum was designed for the 1901 Pan-American Exposition where it now contains thousands of collections, including physical objects, photographs, and books.

The Albright-Knox Art Gallery, also founded in 1862, is a part of the Buffalo Fine Arts Academy, one of the oldest public arts institutions in the country. Located south of the Scajaquada Expressway on Elmwood Avenue, the gallery is an important community resource dedicated to the acquisition, exhibition, and preservation of modern and contemporary art.

In addition to the museum and art gallery, the Rockwell Hall Performing Arts Center (PAC), located adjacent to the gallery, serves as the Study Area's largest performing arts venue. The PAC hosts more than 180 events annually, welcoming over 50,000 patrons in an 856-seat, multi-purpose theatre. The theatre is located on the eastern edge of Buffalo State College, and is an important venue for both college and community groups, including the Buffalo Opera Unlimited, Greater Buffalo Youth Ballet, and St. Joseph Collegiate Institute.

Area colleges further provide amenities that serve both students and the greater community. Buffalo State College, Canisius College, and Medaille College provide important facilities within the college campuses that are open to the public. An example of such facilities includes the Burchfield Penny Art Center at SUNY Buffalo State, a museum exclusively dedicated to the art and artists of Western New York, as well as the Richardson Olmsted Complex (see **Section 2.2.1.2**).

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would improve bicycle and pedestrian connectivity between portions of Delaware Park and between neighborhoods and businesses along and across the corridor through several new and/or improved bicycle and pedestrian facilities.

The Build Alternative would add six new crossing opportunities at the following locations:

- Buffalo State College,
- Elmwood Avenue,
- Lincoln Parkway,
- Hoyt Lake,
- Delaware Avenue, and
- Buffalo Parks Maintenance Facility.

These crossings, in addition to four existing grade-separated crossing opportunities and two existing at-grade crossings at Parkside Avenue, would provide pedestrians with 12 different opportunities to cross NYS Route 198. **Section 3.3.2** includes more information about the facilities included for pedestrians and bicyclists.

The Build Alternative would expand sidewalks and shared-use paths, primarily along the south side of the corridor, providing enhanced access to Delaware Park and numerous adjacent cultural facilities for adjacent neighborhoods, students attending McKinley High School, and Buffalo State College students. Improved pedestrian and bicycle access within the project corridor would result in improved community cohesion.

The Build Alternative would require no displacement of residences or businesses and there would be no relocation impacts. See Section 4.2.3.3 for a discussion of potential impacts from a diversion of traffic.

4.2.3 Social Groups Benefited or Harmed

EXISTING CONDITIONS

4.2.3.1 Elderly and/or Disabled Persons or Groups

Elderly

As indicated earlier in **Exhibit 4.2.1.1-2**, 9.3 percent of the study area is comprised of persons 65 years of age and over. A high concentration of this age cohort resides north of the corridor in the Black Rock, Park Meadow, and Parkside neighborhoods. According to the 2010 Census, there are approximately 1,200 persons 65 and over residing in these three neighborhoods. The neighborhoods south of the corridor include large educational institutions that are typically home to a younger, student-age population; however, there are also over 1,200 persons 65 year of age and over in these neighborhoods. The only nursing home located in the study area is associated with St. Catherine Laboure Health Care Center and Sisters of Charity Hospital located at the intersection of Kensington Avenue, Route 198, and Main Street.

Disabled Persons or Groups

Disability characteristics were available only by census tract, thus covering an area greater than the study area (see **Exhibit 4.2.3-1** in **Appendix B1**). Erie County and the City of Buffalo have a total population with a disability at 12.8 and 16.3 percent, respectively. The census tracts that include the study area have a total population with a disability of 9,264 or 13.6 percent of the total population. Comparatively, this rate is higher than Erie County (12.8 percent) but lower than the City of Buffalo (16.3 percent). As indicated in **Exhibit 4.2.3.1-1**, Census Tract 169, which includes a portion of the Delaware W. Ferry neighborhood, has a higher rate of disability for children under 5 years old (0.3 percent) when compared to the City and County. No other census tract reported disabilities for children under 5 years old. Other neighborhoods had a higher percentage of individuals with disabilities ages 5 to 17 years old when compared to the City and County, including the Leroy, North Park, Parkside, Black Rock, Military, Cold Spring, and W. Forest/State Hospital neighborhoods (indicated in **bold** on **Exhibit 4.2.3.1-1**). Overall, there were more individuals with disabilities in the 18 to 64 age cohort compared to the 65 and over. The highest rate of reported disability in the 18-64 age cohort was in the Leroy neighborhood with 623 persons (Census Tract 40.01) and the highest rate of reported disability in the 65+ cohort was in the Cold Spring neighborhood (Census Tract 168) with 351.

There are two known group homes located in the study area that support persons with disabilities. Heritage Centers is an organization dedicated to providing educational, residential, vocational, and community support to those with disabilities. The Center staff manages a number of group homes known as Individual Residential Alternatives (IRAs) throughout Erie County, which provides varying levels of supervision based on each person's needs. Two of these group homes are located in the study area on Tennyson Avenue and Wallace Avenue, one block north of Hertel Avenue.

Saint Mary's School for the Deaf, located on Main Street in the Study Area, provides academic and recreational activities serving eight counties in Western New York. The school offers education to students from infancy to 21 years old. It further offers some students a five-day residential program to receive additional academic, physical education, and recreational activities.

Disability characteristics were assessed for the population 65 years of age and over, including hearing, vision, cognitive, ambulatory, and self-care difficulties (see **Exhibit 4.2.3.1-2**). Erie County reported over 47,000 persons 65 years of age and over with a disability (5.2 percent of the County's population), while the City of Buffalo reported over 12,000 persons 65 years of age and over with a disability (4.8 percent of the City's population). For this age cohort, each census tract reported at least 50 people 65 years of age and over with a disability. This excludes Census Tract 62.01 - Buffalo State College.

The Cold Spring neighborhood (Census Tract 168; 351 reported disabilities) had the highest rate of hearing and cognitive difficulty with 6.6 percent reporting hearing challenges, and 21.1 percent with cognitive challenges. The North Delaware neighborhood (Census Tract 50) has the highest rate of vision difficulty for persons over 65 years of age with a disability (3.9 percent). Of the 172 persons with a disability over 65 years of age in the Military neighborhood (Census Tract 56), 66 (1.4 percent of the population in that tract) were reported to have self-care challenges, which is defined by the American Community Survey (ACS) as a "physical, mental, or emotional condition lasting 6 months or more, the person has difficulty going outside the home alone to shop or visit a doctor's office." The number of persons 65 years of age and over with a an ambulatory disability, that includes physical and permanent disabilities that prevent them from moving without the aid of a wheelchair, indicates a need for improved pedestrian pathways and accommodations within the study area.

Exhibit 4.2.3.1-1
Disability Characteristics in the Project Study Area and Community of Comparison[1]

Geographic Unit / Census Tract	Total Population	Total Population With a Disability		Population Under 5 years old		Population 5 to 17 years old		Population 18 to 64 years old		Population 65 years and over	
		Total	%	Total w/ a disability	%	Total w/ a disability	%	Total w/ a disability	%	Total w/ a disability	%
Erie County	919,040	117,912	12.8	402	0.04	8,756	1.0	61,082	6.7	47,672	5.2
City of Buffalo	261,310	42,628	16.3	109	0.04	3,583	1.4	26,471	10.1	12,465	4.8
40.01	4,215	921	21.9	0	0	110	**3.6**	623	14.9	188	4.5
45	5,585	548	9.8	0	0	0	0	397	7.1	151	2.7
48	4,247	366	8.6	0	0	9	0.2	220	5.2	137	3.2
49	5,594	661	11.8	0	0	47	**0.8**	420	7.5	194	3.5
50	2,245	420	18.7	0	0	0	0	327	14.6	93	4.1
51	4,671	576	12.3	0	0	46	**1.0**	350	7.5	180	3.9
52.01	2,658	236	8.9	0	0	38	**1.4**	132	5.0	66	2.5
52.02	2,581	336	13.0	0	0	0	0	199	7.7	137	5.3
53	1,577	262	16.6	0	0	0	0	204	12.9	58	3.7
54	4,098	409	10.0	0	0	0	0	318	8.8	91	2.2
55	3,920	625	15.9	0	0	75	**1.9**	433	11.1	117	3.0
56	4,597	854	18.6	0	0	81	**1.8**	601	13.1	172	3.7
62.01	1,879	101	5.4	0	0	0	0	101	5.4	0	0
63.01	4,820	620	12.9	0	0	23	0.5	348	7.2	249	5.2
63.02	2,638	178	6.7	0	0	0	0	60	2.3	118	4.5
168	3,618	894	24.7	0	0	85	**2.4**	458	12.7	351	9.7
169	3,832	452	11.8	11	0.3	17	0.4	261	6.8	163	4.3
171	5,131	805	15.7	0	0	165	**3.2**	466	9.8	174	3.4
TOTAL	**67,906**	**9,264**	**13.6**	**11**	**-**	**696**	**1.0**	**5,918**	**8.7**	**2,639**	**3.9**

[1] Census Data for disability characteristics is only available at the Census Tract level, thus encompassing a greater area than the Project Study Area (Census Bureau, 2010)
Percentages are of the total population for that geographic unit/census tract.

Exhibit 4.2.3.1-2
Disability Characteristics in the Population 65 Years and Over[1]

Geographic Unit / Census Tract	Total Population 65 Years and Older With a Disability		With a Hearing Difficulty		With Vision Difficulty		With a Cognitive Difficulty		With an Ambulatory Difficulty		With a Self-Care Difficulty	
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
Erie County	47,672	5.2	18,804	2.1	7,400	0.8	9,690	1.1	30,612	3.3	9,893	1.20
City of Buffalo	12,465	4.8	3,232	1.2	4,058	1.6	11,001	4.2	15,687	6.0	4,253	1.6
40.01	188	4.5	50	1.2	0	0	38	0.9	125	4.0	62	1.5
45	151	2.7	99	1.8	0	0	0	0	52	0.9	9	0.2
48	137	3.2	43	1.0	10	0.2	20	0.5	95	2.2	21	0.5
49	194	3.5	20	0.4	42	0.8	34	0.6	147	2.6	43	0.8
50	93	4.1	42	1.9	34	1.5	40	1.8	69	3.1	16	0.7
51	180	3.9	56	1.2	31	0.7	52	1.1	129	2.8	18	0.4
52.01	66	2.5	26	1.0	17	0.6	14	0.5	31	1.2	0	0
52.02	137	5.3	23	0.9	29	1.1	17	0.7	129	5.0	51	2.0
53	58	3.7	9	0.6	0	0	0	0	49	3.1	0	0
54	91	2.2	41	1.0	11	0.3	14	0.3	51	1.2	20	0.5
55	117	3.0	54	1.4	28	0.7	53	1.4	82	2.1	13	0.3
56	172	3.7	77	1.7	35	0.8	48	1.0	158	3.4	66	1.4
62.01	0	0	0	0	0	0	0	0	0	0	0	0
63.01	249	5.2	79	1.6	0	0	33	0.7	197	4.1	14	0.3
63.02	118	4.5	42	1.6	20	0.8	36	1.4	70	2.7	30	1.1
168	351	9.7	38	1.1	54	1.5	121	3.3	231	6.4	19	0.5
169	163	4.3	86	2.2	38	1.0	34	0.9	102	2.7	46	1.2
171	174	3.4	47	0.9	29	0.6	33	0.6	109	2.1	6	0.1

[1] Census Data for disability characteristics is only available at the Census Tract level, thus encompassing a greater area than the Project Study Area (Census Bureau, 2010) Percentages are of the total population for that geographic unit/census tract as shown in Exhibit 4.2.3.1-1.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would be designed and constructed in accordance with NYSDOT standards and the 2011 United States Access Board's *Proposed Guidelines for Pedestrian Facilities in the Public Right of Way* (PROWAG); therefore, accessibility would be improved for the elderly and individuals with disabilities.[2] Further, the Build Alternative would expand connectivity for pedestrians of all ages and improve motorist and pedestrian safety along the corridor by reducing vehicular speeds, providing pedestrian signals at crosswalks and increasing pedestrian visibility at crossings. The Build Alternative would not result in adverse impacts to the elderly or individuals with disabilities.

See Section 4.2.3.3 for a discussion of potential impacts from a diversion of traffic.

4.2.3.2 Transit Dependent

EXISTING CONDITIONS

The Niagara Frontier Transportation Authority (NFTA) provides bus service within the study area as described in **Section 2.3.2.3**. While buses utilize the Scajaquada Expressway, the mainline does not contain transit stops or facilities.

The study area includes a large population of college students attending three educational institutions on the south side of the corridor, and includes housing options regularly utilized by students on both sides of the expressway.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

No impacts to the transit system are anticipated beyond a minor increase in travel time (just over two minutes during peak periods of commuter traffic) due to the installation of signals along NYS Route 198 (see **Sections 3.3.2.3** and **3.3.1.5**).

4.2.3.3 *Environmental Justice (Minority and Low Income Populations)*

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by the President on February 11, 1994, directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and/or low-income populations to the greatest extent practicable and permitted by law.

Minority and low-income populations were identified using the following reference guides and data:

- FHWA Environmental Justice Reference Guide (April 1, 2015)
- NCHRP Report 523: Effective Methods for Environmental Justice Assessment
- American Community Survey, Aggregate Data, 5-Year Summary File 2007-2011
- 2010 Census Data

EXISTING CONDITIONS

[2] **Section 3.3.2.1**, includes a discussion with regard to existing pedestrian accommodations.

To identify income, poverty levels, and minority populations, data from the American Community Survey were reviewed and analyzed at the Census Block Group level. The study area is comprised of 18 census tracts and 38 census block groups. For comparison purposes, the analysis considered data for Erie County, the City of Buffalo, and NY State.

Minority Populations

As shown in **Exhibit 4.2.3.3-1**, approximately 66.9 percent of the population within the study area is white, which is higher than the population of the City of Buffalo as a whole, but lower than Erie County. The next largest racial groups in the study area include Black or African American at 21.8 percent, which is a higher percentage than Erie County, but lower than the City of Buffalo, which is 38.6 percent Black or African American. Other populations represented in the study area include Asian (3.4 percent) and American Indian / Alaska Native (0.8 percent), which are comparable to the County and City. The percentages for Some Other Race (5.2 percent) and Two or More Races (4.4 percent) were slightly higher than the County and City. There are no Native Hawaiian or Pacific Islander populations in the study area, which is a comparable percentage with the County and City, which have 0.0 and 0.1 percent respectively.

Exhibit 4.2.3.3-1
Race and Ethnicity

	Erie County		City of Buffalo		Study Area[1]	
	Total	**Percent**	**Total**	**Percent**	**Total**	**Percent**
Total Population	919,040	100.0	261,310	100.0	37,833	100.0
Race						
White	735,244	80.0	131,753	50.4	25,290	66.9
Black or African American	123,931	13.5	100,774	38.6	8,245	21.8
American Indian and Alaska Native	5,908	0.6	2,009	0.8	307	0.8
Asian	23,789	2.6	8,409	3.2	1,282	3.4
Native Hawaiian and Other Pacific Islander	219	0.0	119	0.1	0.0	0.0
Some Other Race	13,427	1.5	10,247	3.9	1,959	5.2
Two or More Races	16,522	1.8	7,999	3.1	1,659	4.4
Ethnicity						
Hispanic or Latino[2]	41,731	4.5	27,519	10.5	3,756	9.9

Source: American Community Survey 2007-2011
[1] Includes Census Block Groups in the Study Area
[2] Hispanic or Latino refers to an ethnicity and language, not race therefore population total overlaps with the race.

The FHWA and USDOT EJ Orders[3] define "minority" individual as:

> "a person who is (1) Black: a person having origins in any of the black racial groups of Africa; (2) Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race; (3) Asian American: a person having origins in any of the original people of the Far East, Southeast Asia, or the Indian Subcontinent; (4) American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through Tribal affiliation or community recognition; or (5) Native Hawaiian and Other Pacific Islander: a person having origins in any of the original people of Hawaii, Guam, Samoa, or other Pacific Islands."

[3] http://www.fhwa.dot.gov/environment/environmental_justice/publications/reference_guide_2015/section05.cfm

The American Community Survey 2007-2011 and 2010 Census data for the following geographic areas were used to analyze effects of the project with respect to minority populations:

- Erie County
- The City of Buffalo
- Census Tracts 40.01, 45, 48, 49, 50, 51, 52.01, 52.02, 53, 54, 55, 56, 62.01, 63.01, 63.02, 168, 169, and 171
- All individual Census Block Groups making up the Study Area (See **Exhibit 4.2.3-1** in **Appendix B1** for Census Block Groups included in the Study Area)

Exhibit 4.2.3.3-2 shows the racial and ethnic compositions of the Census Tracts and Census Block Groups in the study area. To provide regional context, the same indicators are presented for Erie County and the City of Buffalo. Of the 38 Census Block Groups, six have minority populations that exceed 50 percent. The racial distribution in the study area as a whole is 66.6 percent white and 33.4 percent minority. The minority population is higher in the study area than Erie County (20 percent); however, it is lower than the City of Buffalo, which has an overall minority population of almost 50 percent.

According to 2010 U.S. Census data, portions within the Black Rock, Delaware Park, Cold Spring, Leroy, and Hamlin Park neighborhoods are greater than 50 percent minority population (See **Exhibit 4.2.3.3-3** in **Appendix B1**). Parts of these neighborhoods have a majority African American population, including Hamlin Park, Cold Spring, Military, Black Rock, Delaware Park, and Forest. The Cold Spring neighborhood (Census Tract 168 – Block Group 3) has a 96.8 percent minority population, while the eastern side of Hamlin Park is 79.7 percent minority.

Compared to the County and City of 4.5 and 10.5 percent respectively, the total Hispanic / Latino population is higher in five Census Block Groups with over 20 percent Hispanic / Latino (see **Exhibit 4.2.3.3-2**). These concentrations are in the Leroy, Black Rock, and Forest neighborhoods.

Exhibit 4.2.3.3-2
Minority Population

Census Tract	Geographic Unit	Total Population	White[1]		Total Non-White Population[2]		Hispanic or Latino[3]	
			Total	%	Total	%	Total	%
--	Erie County	919,040	735,244	80.0	183,796	20.0	41,731	4.5
--	City of Buffalo	261,310	131,753	50.4	129,557	49.6	27,519	10.5
40.01	Block Group 4	800	101	12.6	699	87.4	52	6.5
	Block Group 5	670	462	69.0	208	31.0	151	22.5
45	Block Group 4	1037	752	72.5	285	27.5	47	4.5
48	Block Group 1	1402	1219	86.9	183	13.1	129	9.2
	Block Group 2	1468	1199	81.7	269	18.3	43	2.9
49	Block Group 5	1171	863	73.7	308	26.3	118	10.1
	Block Group 2	1601	1246	77.8	355	22.2	182	11.4
	Block Group 3	756	459	60.7	297	39.3	55	7.3
	Block Group 4	600	529	88.2	71	11.8	0	0.0
50	Block Group 1	989	577	58.3	412	41.7	183	18.5
	Block Group 2	480	371	77.3	109	22.7	53	11.0
	Block Group 3	784	407	51.9	377	48.1	0	0.0
51	Block Group 4	1291	1082	83.8	209	16.2	73	5.7
52.01	Block Group 1	845	771	91.2	74	8.8	0	0.0
	Block Group 2	648	589	90.9	59	9.1	0	0.0
	Block Group 3	462	327	70.8	135	29.2	49	10.6
	Block Group 4	814	631	77.5	183	22.5	13	1.6
52.02	Block Group 1	1340	796	59.4	544	40.6	86	6.4
	Block Group 2	1241	252	20.3	989	79.7	15	1.2
53	Block Group 1	646	434	67.2	212	32.8	26	4.0
	Block Group 2	931	459	49.3	472	50.7	37	4.0
54	Block Group 1	1412	1082	76.6	330	23.4	125	8.9
	Block Group 4	1283	954	74.4	329	25.6	17	1.3
	Block Group 3	656	632	96.3	24	3.7	0	0.0
	Block Group 2	747	592	79.3	155	20.7	0	0.0
55	Block Group 1	1122	581	51.8	541	48.2	304	27.1
	Block Group 2	1153	683	59.2	470	40.8	329	28.5
	Block Group 3	721	457	63.4	264	36.6	241	33.4
	Block Group 4	924	361	39.1	563	60.9	87	9.4
56	Block Group 3	1421	557	39.2	864	60.8	281	19.8
62.01	Block Group 1	1879	1001	53.3	878	46.7	216	11.5
63.01	Block Group 1	1162	884	76.1	278	23.9	163	14.0
63.02	Block Group 1	959	953	99.4	6	0.6	51	5.3
	Block Group 2	1184	1120	94.6	64	5.4	50	4.2
	Block Group 3	607	607	100.0	0	0.0	0	0.0
168	Block Group 3	473	15	3.2	458	96.8	0	0.0
169	Block Group 4	1156	642	55.5	514	44.5	34	2.9
171	Block Group 5	998	548	54.9	450	45.1	219	21.9
Project Study Area Totals		**37,833**	**25,195**	**66.6**	**12,638**	**33.4**	**3,429**	**9.1**

Source: American Community Survey 2007-2011
[1] Reported as one race.
[2] Includes: Black or African American; Asian; American Indian or Alaskan Native; Native Hawaiian or Other Pacific Islander; Some Other Race Alone; and Two or More Races.
[3] Hispanic or Latino refers to an ethnicity and language, not race therefore population total overlaps with the race.

Income and Poverty Rates

The FHWA and USDOT EJ Orders[4] define a "low-income" individual as:

> "a person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines. This differs from CEQ guidance on EJ, which suggests the use of U.S. Census Bureau poverty thresholds."[5]

Income and poverty data were derived from the 2007 – 2011 American Community Survey and 2010 Census. Income and poverty data are available for Census Block Groups, and not individual Census Blocks, thus Census Block Group data were used to evaluate effects on low-income populations (See **Exhibit 4.2.3-1** in **Appendix B1**).

There are several portions of the study area where over 50 percent of the households are below the poverty level. As indicated in **Exhibit 4.2.3.3-4** in **Appendix B1**, these are located in the eastern side of the Black Rock neighborhood (Tract 55, CBG 4), directly north of the Scajaquada Expressway, as well as Delaware Park (Tract 53, CBG 2).

Additional neighborhoods that have household poverty rates greater than 40 percent include the Leroy neighborhood (41 percent), while several others experience a household poverty rate greater than 30 percent, including Military (35 percent), Cold Spring (32 percent), and western side of the Black Rock (36 and 37 percent) and Hamlin (39 percent) neighborhoods.

The high rate of poverty and a low median household income for a number of these neighborhoods may be skewed as a result of a high student population. The Black Rock neighborhood is near Buffalo State College, the Delaware Park neighborhood includes Medaille College, and the Hamlin Park neighborhood includes Canisius College.

The poverty rates identified in **Exhibit 4.2.3.3-5** directly correspond to the median household income. According to the 2010 American Community Survey, the overall study area median household income ($46,823) is higher than the City of Buffalo, but lower than the remainder of the County and New York State.

The lowest reported household median income is $9,767 within the Black Rock neighborhood (Census Tract 55, CBG 4) where 63 percent of the households are below the poverty level. Several other areas have a median household income of less than $25,000, including Cold Spring ($20,144), and Black Rock ($24,727). In contrast, the Starin Central neighborhood has a median household income of $106,111. The Albright neighborhood, located directly adjacent to the Scajaquada Expressway, has a household median income that ranges from $66,339 - $85,556 and a poverty level of one percent to 15 percent. Data were not collected for Buffalo State, thus entered as "0."

[4] http://www.fhwa.dot.gov/environment/environmental_justice/publications/reference_guide_2015/section05.cfm

[5] The Census Bureau's poverty statistics represent the number of people below the Census Bureau poverty thresholds. Neither the Census Bureau nor the U.S. Department of Health and Human Services publish tabulations of the number of people below the HHS poverty guidelines, which are a simplified version of the poverty thresholds used for program eligibility purposes, although they are used when estimating the number of persons eligible for particular programs. The best approximation for the number of people below the HHS poverty guidelines in a particular area would be the number of persons below the Census Bureau poverty thresholds in that area.

Exhibit 4.2.3.3-5
Low-Income and Poverty Populations

Census Tract	Geographic Unit	Total Households	Median Household Income ($)	Households Below the Poverty Level	
				Total	%
--	New York State	7,317,755	58,687	1,071,715	14.7
--	Erie County	383,164	51,050	54,924	14.3
--	City of Buffalo	112,536	31,668	31,749	28.2
40.01	Block Group 4	302	25,694	124	41.1
	Block Group 5	293	27,226	92	31.4
45	Block Group 4	298	106,111	2	0.7
48	Block Group 1	543	79,340	36	6.6
	Block Group 2	646	58,750	45	7.0
49	Block Group 5	708	58,015	130	18.4
	Block Group 2	393	47,438	54	13.7
	Block Group 3	322	60,493	0	0.0
	Block Group 4	567	42,500	43	7.6
50	Block Group 1	544	45,469	96	17.6
	Block Group 2	248	41,111	63	25.4
	Block Group 3	382	32,222	79	20.7
51	Block Group 4	441	51,420	41	9.3
52.01	Block Group 1	383	61,450	25	6.5
	Block Group 2	276	59,265	26	9.4
	Block Group 3	152	58,859	31	20.4
	Block Group 4	442	42,083	132	29.9
52.02	Block Group 1	302	33,777	120	39.7
	Block Group 2	544	31,250	153	28.1
53	Block Group 1	264	62,000	35	13.3
	Block Group 2	275	11,373	163	59.3
54	Block Group 1	761	48,992	96	12.6
	Block Group 4	410	58,984	89	21.7
	Block Group 3	281	94,219	35	12.5
	Block Group 2	537	34,625	101	18.8
55	Block Group 1	404	35,000	120	29.7
	Block Group 2	522	33,793	197	37.7
	Block Group 3	301	24,727	109	36.2
	Block Group 4	386	9,767	243	63.0
56	Block Group 3	574	30,972	205	35.7
62.01	Block Group 1	0	0	0	0.0
63.01	Block Group 1	498	52,155	114	22.9
63.02	Block Group 1	434	85,556	8	1.8
	Block Group 2	488	66,339	51	10.5
	Block Group 3	303	69,688	48	15.8
168	Block Group 3	221	20,144	71	32.1
169	Block Group 4	209	28,021	48	23.0
171	Block Group 5	241	35,162	59	24.5
Project Study Area Totals		**14,895**	**46,823**	**3,082**	**20.70**

POTENTIAL EFFECTS: BUILD ALTERNATIVE

Although minority and low-income populations are present within the study area, the Build Alternative would not result in significant adverse effects, as described in various sections of this FDR/FEIS.

The area that has the potential to be affected by traffic diversion from NYS Route 198 was identified through traffic studies as discussed in **Section 2.3.1.7.(1)**. The GBNRTC, in cooperation with the NYSDOT, performed studies to assess the expected magnitude of diversion (away from NYS Route 198) that would be induced after completion of the project (see **Section 3.3.1.6**). The combined studies concluded that the change from the 50 mile per hour posted speed limit to the 30 miles per hour speed limit and other changes of May 2015, showed that 15% to 25% of traffic had found an alternate route, and it was estimated that an additional 5% diversion would occur along NYS Route 198 as a result of the Build Alternative. Based on capacity analyses of local intersections within the traffic diversion area, which is included in the study area, the adjacent street network is anticipated to have adequate capacity to absorb the diversion of traffic calculated for the Build Alternative. Minor traffic operations improvements are recommended at the intersection of Nottingham Terrace and Amherst Street and on the Delevan Avenue approach to Delaware Avenue (see **Section 3.3.1.7(1)**). These improvements would ensure that peak hour operations become no worse than the No-Build conditions at those intersections.

As part of a traffic noise analysis for the project (see **Section 4.4.17** and **Appendix B10**), receiver locations B, C and P1 were located in the Black Rock Neighborhood and receiver locations N and O were located in the Hamlin Park Neighborhood. Traffic noise levels were predicted to be the same between the existing conditions and Build Alternative for the years studied at receiver locations C, P1, N and O. Traffic noise levels at location B were predicted to be lower by 1 dBA.

An air quality microscale analysis for particulate matter (PM) was conducted for the project (see **Section 4.4.15** and **Appendix B8**). The Parkside Avenue and Scajaquada Expressway intersection was selected for the analysis. The results of the analysis showed that no exceedances of the $PM_{2.5}$ or PM_{10} National Ambient Air Quality Standards are estimated at any of the modeling receptor points under the Build Alternative.

The Build Alternative would also not involve the taking of any residential properties.

Residents in the immediate area and region would benefit from the enhanced roadway safety, improved compatibility of the roadway with its surroundings (including enhanced bicycle and pedestrian facilities), and improved infrastructure that would be provided under the Build Alternative. This would include students at Buffalo State College, Medaille College and Canisius College, who would realize benefits in attending classes and resources in the surrounding area. Further discussion on the benefits for college students is included in **Section 4.7**.

Potential impacts during construction are discussed in **Section 4.5**.

Therefore, the Build Alternative would not result in disproportionate and adverse effects on the minority and low-income populations of the adjacent neighborhoods.

Public Outreach

Consistent with NYSDOT's commitment to Title VI of the Civil Rights Act of 1964 and Executive Order 12898 Environmental Justice, efforts were made to provide minority and low-income populations with meaningful access to public information and involve the public in the development of reasonable alternatives. Documentation of the public involvement for the project is provided in **Appendix G**. This has included over 40 public involvement meetings at various locations throughout the Study Area. Meetings located in or near Environmental Justice Neighborhoods are shown in **Exhibit 4.2.3.3-6**.

A Project Stakeholder Group was formed at the beginning of project development. **Section G.2** in **Appendix G** outlines the responsibilities of the stakeholder group. A list of stakeholder group members is provided as **Exhibit G.2.1** in **Appendix G**. Many of these members represent the various neighborhoods in the study area, including:

- Black Rock-Riverside Alliance
- Black Rock-Riverside Good Neighbors Planning Alliance

- Elmview Place Block Club
- Elmwood Village Association
- Forest District Civic Association
- Grant-Amherst Business Association
- Parkside Community Association
- Restore Our Community Coalition

To encourage participation in the project by populations within the Environmental Justice neighborhoods, meeting notices were not only published in newspapers in general circulation, but also in in the Buffalo Rocket, a local newspaper in the study area.

Exhibit 4.2.3.3-6
Public Outreach Meetings Near Environmental Justice Neighborhoods

Meeting(s)	Date(s)	Location	Associated Environmental Justice Neighborhoods*
NEPA Scoping Meeting	November 28, 2007	Medaille College Lecture Hall	Hamlin Park Cold Spring
Interactive Design Workshop #2	November 4, 2009	Saint Mary's School for the Deaf	Hamlin Park Leroy
Meeting with the Humboldt Community Association / Glenwood Neighborhood	March 2, 2016	Sister's Hospital	Hamlin Park Leroy
Stakeholder Group Meeting #4	April 29, 2009	Buffalo Zoo	Delaware Park
Interactive Design Workshop #3 Stakeholder Group Meeting #5 Stakeholder Group Meeting #6 Stakeholder Group Meeting #7	April 29, 2010 April 28, 2011 February 15, 2012 March 21, 2013	Marcy Casino	Delaware Park
Stakeholder Group Meeting #3 Buffalo State College Campus Update Interactive Design Workshop #1 Public Meeting #1 Public Meeting #3 Public Meeting #5	April 23, 2008 July 9, 2009 September 16, 2009 April 9, 2014 February 10, 2016 August 8, 2017	Buffalo State College	Black Rock
Public Meeting #4 Public Hearing	May 19, 2016 January 25, 2017	Frederick Law Olmsted School	Black Rock

*Associated Neighborhoods are within walking distance (less than 0.5 miles)

Limited English Proficiency (LEP)

Since 2000, the City of Buffalo and Erie County have experienced an increase in the number of refugees settling in the City of Buffalo and surrounding neighborhoods.[6] As a result, the number of languages represented in both the public schools and community has increased. According to the American Community Survey (2010), which provides data at the County level for languages spoken, the primary

[6] Immigrants, Refugees, and Languages Spoken in Buffalo. (2015). Partnership for Public Good. Accessed on August 8, 2016: http://archives.ppgbuffalo.org/wp-content/uploads/2011/01/Immigrants-Refugees-and-Languages-Spoken-in-Buffalo.pdf

language spoken is English where over 90 percent of County residents are fluent. The next most common languages include Spanish (3 percent), Polish (< 1 percent), Chinese (< 1 percent), and Italian (< 1 percent). All languages other than English combined account for 9.5 percent (83,650 people).

As discussed above, census data indicate that the Hispanic / Latino population makes up over 20 percent of five Census Block Groups, which exceeds the percent of the general population in both Erie County (4.5%) and the City of Buffalo (10.5%).

For compliance with EO 13166, "Improving Access to Services for Persons with Limited English Proficiency," and New York State Executive Order 26, “Statewide Language Access Policy,” many meeting notices were translated into Spanish and published in local newspapers as well as those in general circulation. Opportunities have been available to have meeting materials translated into other languages. “I Speak Cards” and interpretive services were made available at formal public meetings.

4.2.4 School Districts and Places of Worship

4.2.4.1 School Districts

EXISTING CONDITIONS

The City of Buffalo School District has two facilities within or adjacent to the study area, including McKinley High School located on Elmwood Avenue, on the north side of Scajaquada Creek, and PS 54 (Dr. George E. Blackman School), which is located along Main Street on the eastern edge of the Parkside neighborhood. The City of Buffalo School District Transportation Program Policy states that all students living within 1.5 miles from their school are not provided transportation services, and therefore may be required to walk to school.

There are also three college campuses in the study area: Buffalo State College, Medaille College and Canisius College. They are located in the Buffalo State, Delaware Park and Hamlin Park neighborhoods respectively (see **Exhibit 4.2-1** in **Appendix B1**). Many college students find housing and services off-campus in the surrounding neighborhoods, and many students walk or bicycle to these locations. Access to off-campus resources is limited by the lack of crossings over NYS Route 198 (see **Section 4.2.2.1**).

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The proposed bicycle and pedestrian accommodations under the Build Alternative, especially the pedestrian facilities on the corridor’s south side (see **Section 3.3.2**), have the potential to decrease vehicular traffic by providing convenient alternative transportation options for area students to access on- and off-campus destinations. The Build Alternative would also provide the additional crossing and shared-use paths (see **Sections 3.3.2**) for area high school students to safely walk to McKinley High School from within the City of Buffalo School District’s 1.5 mile no-transportation zone.

4.2.4.2 Places of Worship

EXISTING CONDITIONS

There are 25 properties associated with places of worship within the study area, with just one of these properties, the Church of the Assumption, located directly adjacent to the Scajaquada Expressway. The nearest crossing of NYS Route 198 to this church is at Grant Street.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would not adversely affect places of worship in the study area. The Build Alternative would not reduce the number of housing units within the Study Area and would not impact the size of existing or

potential congregations for any religious community. The crossing that would connect Buffalo State with the Jesse Kregal Pathway would provide another means for parishioners to access the Church of the Assumption.

4.3 Economic

EXISTING CONDITIONS

The three colleges in the study area (see **Exhibit 4.2-1** in **Appendix B1)** are a substantial component of the area economy (see **Section 4.2.4.1** and **Section 4.6** for additional information). Besides serving the local area, the cultural amenities along the project area attract tourists from beyond the project study area, which contributes to the local economy.

There are also several established business districts and commercial corridors located within the study area, including the "Elmwood Strip" commercial district, as well as portions of the Black Rock, Park Meadow, W. Forest, and Hamlin Park neighborhoods as shown in **Exhibit 4.3-1** in **Appendix B1**.

The Elmwood Strip commercial district is approximately 2.1 miles long and runs north-south along Elmwood Avenue between Forest Avenue and Virginia Street. Approximately one-half mile is located within the Study Area. The Elmwood commercial district contains a high concentration of cafes, restaurants, night clubs, and specialty shops. This corridor serves surrounding residential neighborhoods, as well as Buffalo State students who are within short walking distance of the corridor. In addition to these uses, the commercial corridor features a summer concert series, music festivals, and holiday tree lighting ceremony.

The Black Rock neighborhood also contains a well-established commercial district along Amherst Street located in the northwest portion of the Study Area. The corridor is approximately 0.7 miles long and runs east-west, gradually transitioning from commercial uses to residential. This corridor contains a number of small, local businesses that range from professional offices and services (e.g., tax preparer, insurance office), to florists, restaurants, specialty grocery, coffee bars, and salons.

Adjacent to the Black Rock neighborhood, the Park Meadow neighborhood contains two commercial corridors located north of NYS Route 198. Running north-south, there is a concentration of commercial businesses located along Delaware Avenue that extends approximately 0.45 miles north to the edge of the study area. There are a range of businesses located within a number of shopping plazas that contain common big-box and national retail establishments. Located along Hertel Avenue to the west is another district that contains commercial businesses primarily concentrated in the area from Delaware Avenue to Tuxedo Place.

The Hamlin Park neighborhood contains commercial businesses along the Main Street corridor, located on the southeastern edge of the study area. Commercial uses along Main Street include storage and moving facilities, a number of restaurants, and service and repair shops. Within this corridor are a number of vacant store fronts and properties along the corridor that are classified by the Office or Real Property and Tax Services as vacant commercial, and do not contain any active businesses.

Similarly, a concentration of commercial properties, classified as both vacant and occupied, can be found along Niagara Street in the W. Forest neighborhood on the western edge of the study area. Scattered along the corridor are several restaurants and bars, as well as a high concentration of service businesses including car lots, repair shops, gas stations, and car washes.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would improve local connectivity among the colleges and cultural resources along NYS Route 198. The Build Alternative would support the growth of the colleges and surrounding area, and potentially promote economic growth and development in the study area. The enhancement of the

cultural amenities along the corridor would continue to promote tourism and the economic contributions from this tourism.

Despite the number of businesses and commercial corridors in the study area, the crossings and other roadway improvements proposed under the Build Alternative would not directly cross or include any of these districts. The Build Alternative includes bicycle and pedestrian connectivity improvements along and across the corridor that would enhance access to local neighborhood businesses and commercial corridors. For example, the Build Alternative includes a pedestrian bridge over NYS Route 198 to link on-campus housing on the Buffalo State College Campus with commercial and retail establishments along Amherst Street. This direct connectivity would enhance the ability of on-campus pedestrians to access goods, services and employment opportunities previously accessible only by automobile or from a longer walk to the Grant Street Bridge or the Elmwood Avenue Bridge.

There would be no relocations as a result of the Build Alternative. The economic impact on the tax base from the Build Alternative would be negligible, since most of the right-of-way acquisition would be from public parcels that do not generate tax revenue (see **Section 3.3.3.1. (1)**).

The Build Alternative would involve the relocation of driveway access to one business to improve safety for ingress/egress to Grant Street south of the (southern) Grant Street Connector. Access would be maintained to this business throughout construction and no adverse impacts are anticipated to result from this minor alteration.

Potential impacts during construction are discussed in **Section 4.5**.

4.4 Environmental

4.4.1 Wetlands

EXISTING CONDITIONS

The study area for wetlands included the project corridor and those areas immediately adjacent to the corridor (see **Section 1.4.2**).

There are no NYSDEC regulated (Environmental Conservation Law (ECL) Article 24) freshwater wetlands or adjacent areas within the study area, as mapped per the Environmental Resource Mapper on the NYSDEC website[7] and confirmed during a site visit. The nearest mapped New York State state-regulated wetland is approximately 3.3 miles to the northwest of the west end of the wetlands study area.

The National Wetland Inventory maps[8] maintained by the USFWS identify both riverine and lacustrine wetlands associated with the alignment of the Scajaquada Creek in the study area.[9] Field wetland delineations were completed in 2008 and 2013 to determine the type, size and boundaries of these wetlands using the methodology of the USACE 1987 Wetlands Delineation Manual and the 2012 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region. Two wetland areas meeting the USACE methodology were delineated in the riparian zone of Scajaquada Creek and are shown on **Exhibit 4.4.2-1** in **Appendix B1**. A report outlining the wetland identification and delineation is found in **Appendix B3**.

[7] http://www.dec.ny.gov/animals/38801.html

[8] https://www.fws.gov/wetlands/Data/Mapper.html

[9] While the majority of the USFWS NWI wetland areas do not meet the criteria of wetlands per the 1987 USACE methodology, they are considered waters of the United States and are discussed in **Section 4.4.2**.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative was designed to avoid impacts to the two federal jurisdictional wetlands within the study area. The Build Alternative would therefore have no effect on wetlands.

During final design, a signed preliminary Jurisdictional Determination form would be submitted to the USACE with the Pre-Construction Notification for fill in Scajaquada Creek (see **Section 4.4.2**). The submission package to the USACE would acknowledge that wetlands are present but will not be impacted, and would seek authorization for stream impacts. Please see **Section 4.4.2** for details regarding stream impacts.

4.4.2 Surface Waterbodies and Watercourses

EXISTING CONDITIONS

The study area for surface waterbodies and watercourses included the project corridor and those areas immediately adjacent to the corridor.

Surface waters in the NYS Route 198 project area are shown in **Exhibit 4.4.2-1** in **Appendix B1**.

Scajaquada Creek: Scajaquada Creek flows east to west through the study area to its mouth in the Black Rock Canal section of the Niagara River. The watershed covers an area of 29 square miles. The source of Scajaquada Creek is a spring in the Town of Lancaster, approximately 15 miles east of the study area. Historically, the creek was wide, shallow and meandering, surrounded by extensive marshes and meadows. Over time, the main channel became routed through underground tunnels in three areas. One of the underground tunnels is where Scajaquada Creek flows under the Walden Galleria Mall.

The largest of the underground tunnel areas resulted from the "Scajaquada Drain" project (completed in 1928), which tunneled 3.5 miles of the creek underground. This tunnel starts near Pine Ridge Road and outlets in Forest Lawn Cemetery near its Main Street entrance. Sewer systems crossing the creek were disconnected in the 1930s, allowing the creek to become a conduit for sewer overflows. In 1938, the "Delevan Drain" was built to divert the combined sewage at Main Street directly to the Bird Island Treatment Plant; however, the Delevan Drain was designed to allow high flows, such as during storm events, to exit the tunnel and continue flowing down the stream channel.

As the creek resurfaces just inside the Main Street entrance to Forest Lawn Cemetery, it flows through the cemetery and is recharged by underground springs. The Onondaga Escarpment creates Serenity Falls on Scajaquada Creek in Forest Lawn Cemetery, the only waterfall in the City of Buffalo.

Hoyt Lake: In the original design of Delaware Park, the prominent water feature was a 42-acre lake formed by damming Scajaquada Creek. It was originally called "The Gala Waters" or "The Lake," and is now named Hoyt Lake. The northwest bay of the lake on the north side of the Scajaquada Expressway is known as "North Bay" and as "Mirror Lake[10]."

As part of the construction of the Scajaquada Expressway in 1960, large portions of the park lake were filled. The lake retained little of its original shoreline. The sewage overflows during times of high flow in Scajaquada Creek (described above) extended to the lake. A 1950s study by the Erie County Health Department declared the lake a health hazard and it was closed to the public. To protect the lake from the creek's polluting waters, the two were separated in the early 1980s. The creek was rerouted next to the lake in two conduits that outlet west of Lincoln Parkway, where a dam keeps the lake and creek separate in all but high flow situations. This further reduced the shoreline of the lake.

[10] There is another waterbody known as "Mirror Lake" located within Forest Lawn Cemetery which would not be associated with this project.

Stream velocity slows at the tunnel outlet, and sewage and sediment accumulate in the channel. Water quality in the lake has improved, but it still does not support desirable fish species. The disconnected lake now requires periodic recharge from wells. An upgrade to two groundwater wells along Hoyt Lake to improve water quality started in September 2012. A fountain was installed in September 2013, which improves dissolved oxygen in the lake. Other projects being developed to improve water quality at Hoyt Lake include the dredging of contaminated sediments from the lake.

Further downstream at the tunnel outlet is a finger dam that was constructed by the USACE and is known to trap garbage that enters the creek. This reach of the creek is channelized downstream of Hoyt Lake with banks that are hard-armored with rip-rap.

Just west of the I-190 interchange, Scajaquada Creek empties into the Black Rock Canal of the Niagara River. The finger dam is also known to trap material from traveling up Scajaquada Creek from the backwaters of the Black Rock Canal at times of high flow on the Canal and River.

Based upon a review of the NYSDEC Geographic Information System (GIS) data maps for regulated streams, Scajaquada Creek and Hoyt Lake are both Class B Streams with B Standards. The best usages for Class/Standard B waters are for primary and secondary contact recreation and fishing. The water quality is suitable for fish propagation and survival.

Scajaquada Creek is on the Final New York State 2014 Section 303(d) List of Impaired Waters Requiring a Total Maximum Daily Load (TMDL). These are waters with verified impairments that are expected to be addressed by a segment/pollutant-specific TMDL. Pollutants listed include floatables, dissolved oxygen/oxygen demand, phosphorus and pathogens. The sources for these pollutants are listed as Combined Sewer Overflows (CSOs)[11] and Urban Runoff.

Hoyt Lake is listed as “Delaware Park Lake” on the Final New York State 2014 Section 303 (d) List of Impaired Waters Requiring a TMDL. More specifically, the lake is listed as “Multiple Segment/Categorical Impaired Waterbody Segments (fish consumption).” The pollutant named is polychlorinated biphenyl (PCB), and the source is listed as “Contaminated Sediment, Land Disposal.”

Scajaquada Creek is a major contributor of pollutants to the Niagara River, a Great Lakes “Area of Concern” as defined in the Lake Ontario Lakewide Management Plan, and is listed as a high priority stream on the Erie County Water Quality Coordinating Committee’s Water Quality Strategy.

The pollutants presenting the greatest threats to Scajaquada Creek are discussed below.

Combined Sewer Overflows (CSOs)

There are two CSO locations shown on the NYSDEC’s Stormwater Interactive Map[12] for the study area. They are shown on **Exhibit 4.4.2-1** in **Appendix B1**, and listed in **Exhibit 4.4.2-2.**

[11] Most of Buffalo’s sewers are combined sewers, which carry sewage, industrial waste, and stormwater in a single pipe system. During a rain storm, runoff water flowing over hard surfaces rushes quickly into sewers. This flow can cause a dramatic increase of water flowing into and through the combined sewers. When this happens, control devices may allow some of the flow (a combination of stormwater and sewage) to overflow into area waterways to prevent urban flooding and damage to wastewater treatment facilities. This event is called a combined sewer overflow or CSO.

[12] See http://www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Exhibit 4.4.2-2
Combined Sewer Overflows affecting Scajaquada Creek in the vicinity of NYS Route 198

Coordinates (UTM 18)	Outfall No.	Street
E: 183601 N: 4760893	56	Nottingham Terrace
E: 183529 N: 4760836	60	Elmwood Ave

Source: http://www.dec.ny.gov/imsmaps/stormwater/viewer.htm
SPDES No: NY0028410

Sediment Accumulation and Dredging

Lack of flushing and circulation in Hoyt Lake, and a decrease in stream velocity at the outlet of the lake by-pass has led to sediment deposition in both waterbodies. Sediments at the by-pass conduit outfall include high concentrations of sewage, while lake sediments may contain high concentrations of heavy metals and organic matter. Water quality at both locations is hazardous to aquatic species survival and propagation.

Sediments from upstream bank erosion accumulate in the creek and Hoyt Lake, degrading water quality and stressing fish. Sediment remediation took place in 1999 to remove coal tar sludge on National Fuel Gas property under the Scajaquada Expressway. Many tons of contaminated sediment still remain at several sites downstream of Delaware Park.

Scajaquada Creek is identified in the January 2012 Remedial Action Plan, Stage 2 Addendum to the Niagara River Area of Concern under a Beneficial Use Impairment (BUI) for restrictions on dredging activities. Dredging is necessary in the Black Rock Canal for the purpose of commercial navigation. Open lake disposal of this sediment is not possible due to the high levels of metals and cyanide present. The implication in the report is that removal of contaminated sediments in Scajaquada Creek would prevent the contamination from migrating downstream into the sediments in the Black Rock Canal.

Nutrients, Salts and Thermal Pollution

Many of the pollutants found in Scajaquada Creek enter through stormwater and direct runoff. Fertilizers and pesticides applied to streamside properties often run off or leach directly into the stream. Fertilizers and grass clippings leaching into the stream increase nutrient levels in the water supply, which cause excess algae blooms, depleting dissolved oxygen in the stream. Common household herbicides/pesticides, such as glyphosate and chlorpyrifos, are toxic to avian and aquatic species.

Stormwater runoff from driveways, parking lots, rooftops and streets contains animal waste, road salt, oil, chemicals, fertilizer, yard waste, soil particulates and litter, flowing untreated into the stream. Stormwater is often much warmer than natural stream flow from contact with heated surfaces, further degrading aquatic habitat.

Pathogens

A continuing problem in Scajaquada Creek is the frequent flushing of CSOs upstream of Forest Lawn Cemetery and the resulting degradation of water quality and sludge buildup. Scajaquada Creek is contaminated with Type C Botulism, which is fatal to birds, waterfowl and some other wildlife, but not harmful to humans.

PCB Contamination

During September 1996, the NYSDEC collected young-of-year (y-o-y) fish for contaminant monitoring from upstream locations in 14 Lake Ontario tributaries and two Niagara River tributaries, including Scajaquada Creek. Fish composites were analyzed for PCBs, pesticides and other toxins. The analytical data show detectable levels of PCBs, DDE, DDD, DDT, mirex, chlordane, trans-nonachlor, dieldrin, 3 dioxin congeners and 8 furan congeners. The highest PCB level (1407 ppb wet weight) was in y-o-y fish from Scajaquada Creek.

The NYSDEC has been (see discussion below) and will continue to be consulted regarding potential restrictions to construction activities due to fish spawning seasons or other water quality concerns.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

Exhibit 4.4.2-3 summarizes the work under the Build Alternative that is anticipated to occur in or in proximity to surface waters.

Exhibit 4.4.2-3
Proposed Work in or in Proximity to Surface Waters

Structure	Proposed Work	Work in Water
Bridge carrying Grant Street over NYS Route 198 and Scajaquada Creek (BIN 1039910)	No changes	None
Bridge carrying Ramp GF (Grant Street) over Scajaquada Creek (BIN 1039930)	Remove structure	Temporary work in water
Bridge carrying Ramp GE (Grant Street) over Scajaquada Creek (BIN 1039940)	Remove structure	Temporary work in water
New Bridge carrying new Grant Street Connector over Scajaquada Creek	New bridge	See Exhibit 4.4.2-4
New Shared-Use Path Bridge over Scajaquada Creek east of Grant Street	New bridge	No work in water
Bridge carrying Elmwood Avenue Connector over Scajaquada Creek (BIN 1039959)	Bridge replacement	See Exhibit 4.4.2-4
Elmwood Avenue over NYS Route 198 and Scajaquada Creek (BIN 1039969)	No changes	None
Bridge carrying Westbound (WB) Ramp to Elmwood Ave (BIN 1039970)	Remove structure	Temporary work in water
New Shared Use Path Bridge over Scajaquada Creek adjacent to Ramp EK	New bridge	See Exhibit 4.4.2-4
Bridge carrying NYS Route 198 over Hoyt/Mirror Lake (BIN 1039989)	Bridge Rehabilitation	*None*
Bridge carrying Lincoln Parkway over Scajaquada Creek (Three Nations Bridge (BIN 2260460)	No changes	None

The structures to be removed (BINs 1039930, 1039940 and 1039970) would involve removal of the abutments, middle piers and superstructure. The bottom slabs would remain in the creek.[13] Demolition of these structures would involve work to be conducted within Scajaquada Creek.

Abutments for a new shared-use path bridge over Scajaquada Creek between Grant Street and Elmwood Avenue would be placed away from the banks of Scajaquada Creek. There would therefore be no work or permanent fill anticipated in Scajaquada Creek from this structure.

For a new shared-use path bridge over Scajaquada Creek adjacent to Ramp EK near Mirror Lake, abutments would be placed on the banks of Scajaquada Creek, above the ordinary high water level. Riprap would likely be placed along the channel banks for protection during larger storm events.

The replacement of the Elmwood Avenue Bridge over NYS Route 198 and Scajaquada Creek (BIN 1039969) is being completed as a separate independent project prior to completion of the subject project. Reviews under NEPA and SEQRA, and permitting were conducted separately from the subject project.

[13] The bottom slabs are covered with sediment, and are attached to piles. Removal of the slabs would involve excavation and cutting of piles in contaminated sediments, which would be more disruptive to water quality than leaving the slabs in place.

For the rehabilitation of the bridge carrying NYS Route 198 over Scajaquada Creek at Hoyt Lake (BIN 1039989), the work would include replacing the concrete deck and bearings. It would also include repair of the substructure; however, the abutments are located above Ordinary High Water (OHW). The work would also include painting of steel under the bridge, which may require temporary scaffolding in the water.

The widening of the bridge carrying the proposed Elmwood Avenue Connector over Scajaquada Creek (BIN 1039959) would include construction of new abutments situated behind the existing abutments and a new wingwall on the channel bank and the west side of the bridge. Also, a new bridge to carry the new Grant Street Connector to NYS Route 198 Eastbound over Scajaquada Creek would involve construction of abutments at the edge of the creek. Proposed work on these structures would involve some cut and fill below OHW. Initial preliminary estimates were made for the quantities of cut and fill below OHW for these structures and are shown in **Exhibit 4.4.2-4**.

Temporary work in the water may be required for a number of these bridges. Temporary work in the water could include the need for scaffolding, temporary causeways and cofferdams. All temporary structures and fills needed for construction would be removed at the conclusion of the work. The specific need for temporary fills for construction would be assessed during final design.

Some of the proposed work on the structures may involve work in the stream sediments. See **Section 4.4.19** for discussion of the potential for contaminated sediments and how they would be addressed during construction.

See **Section 4.4.8** for discussion on potential impacts related to stormwater.

Exhibit 4.4.2-4
Preliminary Impact Quantities Below Ordinary High Water for the Build Alternative

Structure	Linear Impact, feet	Cut/Fill Area, Acres	Cut Volume, cubic yards	Volume Fill, cubic yards		
				Earthwork	Concrete	Total
Contract 1 (Stages 1 and 2)						
Elmwood Avenue Connector over Scajaquada Creek (BIN 1039959)	158	0.02	500	335	174	509
Mirror Lake Shared-Use Path Bridge	42	0.01	20	19	0	19
Total for Contract 1	**200**	**0.03**	**520**	**354**	**174**	**528**
Contract 2 (Stage 3)						
New Grant Street Connector Bridge	105	0.01	70	70	0	70
Total for Contract 2	**105**	**0.01**	**70**	**70**	**0**	**70**
Total for the Build Alternative	**305**	**0.04**	**590**	**424**	**174**	**598**

Permit Requirements: Scajaquada Creek and Hoyt Lake are considered to be "waters of the United States." Work to be done below OHW in constructing the Build Alternative is under the jurisdiction of the USACE through Section 404 of the Clean Water Act. The proposed work would be covered under Section

404, Nationwide Permit No. 14, "Linear Transportation Projects." This nationwide permit (NWP) is for "Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways and taxiways) in waters of the United States."[14] For this nationwide permit, a Preliminary Pre-Construction Notification (PCN) is required to be submitted to the USACE for any impact larger than 0.1 acres and for potential effects to a federally threatened or endangered species. A discussion of permitting applicability was held between the NYSDOT and the USACE Buffalo District on September 9, 2017.

The NYSDEC has granted Blanket Section 401 Water Quality Certification for NWP 14, provided that the project complies with the General Conditions, one of which is that "this certification does not authorize discharges greater than 0.25 acres in size or more than 300 feet of stream disturbance." Discussions with the USACE Buffalo District on September 9, 2017 indicate that the project would be permitted by contract. As such, it is anticipated that the project would be able to be covered under the Blanket Section 401 Water Quality Certification based on the preliminary disturbances shown on **Exhibit 4.4.2-4**. In a letter dated August 30, 2016, the NYSDEC stated that the usual restrictive dates for work in these water bodies are from April 15 to May 15 (see **Appendix B1**). In a letter dated January 20, 2017, the NYSDEC noted that the Blanket Water Quality Certification for Nationwide Permit No. 14 contains work restrictive dates prohibiting in-stream work from March 1 to July 15 (see **Appendix B1**). In a communication on October 19, 2016, the NYSDEC informed the NYSDOT that the specific restrictive dates for Scajaquada Creek are April 1st to June 30th (see **Appendix B1**). The NYSDOT will comply with date restrictions required by NYDEC *and evaluate methods which isolate the work area from the creek and are protective of water quality*.

All required permits would be obtained during the final design phase of the project. Work would not commence until the permit(s) are acquired and would adhere to conditions identified in the permit documents.

A NYSDEC Article 15 Protection of Waters Permit is required for disturbing the bed or banks of a stream with a classification of C(T) or higher. Scajaquada Creek and Hoyt Lake are classified as Class B waterbodies; therefore, work within these waters would require coverage under an Article 15 Protection of Waters Permit. However, consistent with the Memorandum of Understanding (MOU) between NYSDOT and NYSDEC dated December 1996, NYSDOT is not required to obtain Individual Permits for projects regulated under Article 15. The MOU does specify the need for coordination for projects involving "protected" streams and including measures to avoid and/or minimize effects. Coordination with the NYSDEC would continue during final design, and include such topics as discussion of the restrictive dates for work in water bodies. A discussion of the avoidance and minimization follows.

Avoidance and Minimization: The requirements of Section 404 of the Clean Water Act include avoidance and minimization of impacts to aquatic resources. The Build Alternative avoids impacts to federal wetlands and impacts have been minimized to Scajaquada Creek. The abutments of the proposed bridges have been set outside of the limits of the OHW, where practicable, and no piers are proposed. The Elmwood Avenue Connector bridge has been shifted to keep the necessary fill for the proposed southwest wingwall to the minimum necessary within the channel. Additionally, erosion and sediment control measures would be designed and a Stormwater Pollution Prevention Plan prepared during final design to further minimize the impacts of the construction-related stormwater runoff from impacting the adjacent waterbodies (see **Section 4.4.8**).

Mitigation Summary: The quantities shown in **Exhibit 4.4.2-4** are preliminary. Since the cut/fill area indicates less than 0.1 acres of cut/fill, which includes area that would be excavated for abutments from below OWH and then filled, the result would not equate to a loss in surface area of the stream. It is therefore anticipated that mitigation would not be required.

[14] Other Nationwide Permits that could apply to some of the proposed work include Nationwide Permit No. 3, "Maintenance" and Nationwide Permit No. 33, "Temporary Construction, Access, and Dewatering."

4.4.3 Wild, Scenic, and Recreational Rivers

There are no National Wild or Scenic Rivers or State Wild, Scenic or Recreational Rivers within or adjacent to the project area.

4.4.4 Navigable Waters

4.4.4.1 State Regulated Waters

EXISTING CONDITIONS

New York State regulations (6 NYCRR Part 608.1) define navigable waters of the state as "all lakes, rivers, streams and other bodies of water in the state that are navigable in fact or upon which vessels with a capacity of one or more persons can be operated notwithstanding interruptions to navigation by artificial structures, shallows, rapids or other obstructions, or by seasonal variations in capacity to support navigation. It does not include waters that are surrounded by land held in single private ownership at every point in their total area." Small boats have been used on Hoyt Lake. Scajaquada Creek downstream of Hoyt Lake is capable of supporting canoes and small boats. These waterbodies are therefore assumed to be state-regulated navigable. These waterbodies are discussed in further detail in **Section 4.4.2**.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

Section 4.4.2 discusses potential effect to the waters in the project area. The Build Alternative would not impede navigation on these water bodies.

A NYSDEC Article 15 Protection of Waters Permit is required for excavation or placement of fill in navigable waters. Scajaquada Creek and Hoyt Lake are considered navigable; therefore, work within these waters would require coverage under an Article 15 Protection of Waters Permit. However, consistent with the Memorandum of Understanding (MOU) between NYSDOT and NYSDEC dated December 1996, NYSDOT is not required to obtain Individual Permits for projects regulated under Article 15. The MOU does specify the need for coordination for projects involving "protected" streams. See **Section 4.4.2** for a discussion of work within and potential effects to Scajaquada Creek and Hoyt Lake and associated permitting and mitigation measures.

4.4.4.2 Rivers and Harbors Act

In 1937, the U.S. Congress stated "Scajaquada Creek, Erie County, New York, is declared to be nonnavigable east of a line 130 feet west of the west line of Niagara Street, City of Buffalo, County of Erie, New York, within the meaning of the Constitution and laws of the United States." (33 USC 51). The creek is therefore navigable between its mouth and 130 feet downstream of Niagara Street (see **Exhibit 4.4.2-1** in **Appendix B1**). The navigable portion of the creek is outside the study area. The western project limit is approximately 3,700 feet upstream of Niagara Street. Since the project does not involve the construction or modification of any bridge, dam, dike, or causeway over any navigable water of the United States, neither a U.S. Coast Guard Section 9 nor Bridge Permit are applicable.

Since the project does not involve the creation of an obstruction to the navigable capacity of any waters of the United States, or in any manner alter or modify the course, location, condition, or capacity of any navigable water of the United States, Section 10 is not applicable.

A federally authorized civil works project of the USACE, the "Cheektowaga Scajaquada Creek Flood Damage Reduction Project" was built in 1981, and is located approximately three miles upstream (east) of the study area. The Build Alternative would not make alterations to, temporarily or permanently occupy, or use the federally authorized civil works project or affect the USACE project's ability to meet its authorized purpose.

4.4.5 Floodplains

Scajaquada Creek is a mapped stream in the National Flood Insurance Program (NFIP). Thus, a floodplain evaluation was conducted to comply with the provisions of Executive Order 11988, Flood Plain Management, as amended by Executive Order 13690, including the Federal Flood Risk Management Standard (FFRMS). The facilities and structures associated with the project would also be designed to be consistent with the intent of the standards and criteria of the requirements of the National Flood Insurance Program (NFIP) contained in 44 CFR Part 60. The federal requirements pertaining to floodplains are implemented in 23 CFR 650 Subpart A, Location and Hydraulic Design of Encroachments on Floodplains. New York State requirements include 6 NYCRR 502, Flood Plain Management Criteria for State Projects. Together, these regulations are applied to determine potential effects on NFIP floodplains within the study area to assure that the project is consistent with all applicable provisions of the State and Federal floodplain requirements. The detailed findings of the floodplain evaluation study are documented in **Appendix B4** – Floodplain Evaluation Report.

EXISTING CONDITIONS

The effective FEMA Flood Insurance Study (FIS) 1% annual chance floodplain boundaries include Scajaquada Creek, as determined from the FEMA Flood Insurance Rate Map (FIRM), Erie County, New York (All Jurisdictions), September 26, 2008. Scajaquada Creek is located within the project limits. The effective FEMA FIS delineates Scajaquada Creek as a Zone-AE[15] with a floodway. Additionally, there are multiple Zone-X[16] areas in the vicinity of NYS Route 198; however, these areas are not regulatory, meaning that proposed development in Zone X areas does not require further coordination with FEMA. The effective FIS products are presented in **Appendix B4** Floodplain Evaluation Report. There are no additional delineated floodplains within the study area.

Much of the NYS Route 198 roadway itself is located in the floodplain or Special Flood Hazard Area (SFHA). The FEMA FIRM and FIS show that the mainline NYS Route 198 would be overtopped in certain areas by the 50-year flood event. Several of the bridges over Scajaquada Creek in the corridor, including the Grant Street ramps, Elmwood Avenue ramps, NYS Route 198, and Lincoln Parkway are shown as having zero or negative freeboard for the 50-year event.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative is within the 1% annual chance floodplain of Scajaquada Creek as indicated by the effective FEMA FIS and the preliminary highway and bridge plans for the Build Alternative. In accordance with the provisions of 6 NYCRR 502 – Flood Plain Management for State Projects, NYSDOT has considered and evaluated the practicality of alternatives to floodplain encroachments. Since the Build Alternative is located in a floodplain, the Part 502 regulations require that the following be determined: (1) a significant encroachment does not exist; (2) there is no significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles; (3) there is no significant risk; and (4) there are no significant impacts on natural and beneficial floodplain values. The floodplain analysis conducted for this FDR/FEIS supports these four items. Revisions to the detailed hydraulic modeling would be conducted during final design to confirm the findings of this section; however, no substantial changes to these findings are anticipated. The detailed findings of the floodplain evaluation study are documented in **Appendix B4** Floodplain Evaluation Report.

[15] Zone AE = areas on a Flood Insurance Rate Map where water surface elevations for the 1% annual chance flood (100-year flood), also known as the Base Flood, have been determined.

[16] Zone X = areas on a Flood Insurance Rate Map of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot, or with drainage areas less than1 square mile.

4.4.6 Coastal Resources

EXISTING CONDITIONS

The New York State Department of State (NYSDOS) has authority from State and Federal legislation to insure that State and Federal government activities along the coasts and waterways of New York State are consistent with NYS Coastal Policies and approved Local Waterfront Revitalization Programs (LWRP). The western portion of Scajaquada Creek within the project limits is located in the Landward Coastal Boundary Line (see **Exhibit 4.4.6-1**).

A Federal Aid Notification letter dated August 3, 2016 and a Coastal Assessment Form (CAF) were sent to the NYSDOS (see **Appendix B1**).

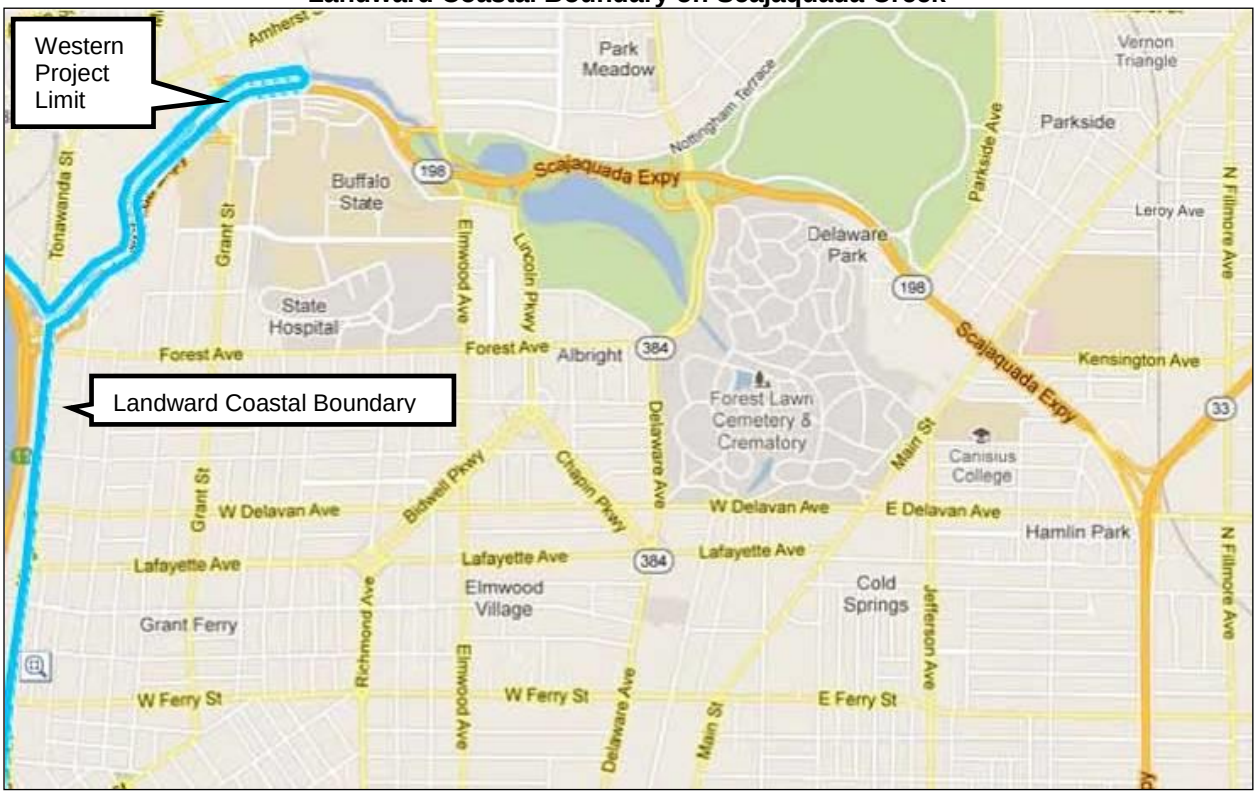
The project is not located in a Significant Coastal Fish and Wildlife Habitat, as defined by the NYSDOS Division of Coastal Resources and Waterfront Revitalization.

The project is not located in or near a Coastal Erosion Hazard Area.

The City of Buffalo has a Draft LWRP dated October 2015. Scajaquada Creek is within the LWRP boundary and considered a valuable community resource. The Scajaquada Pathway (now the Jesse Kregal Pathway) is recognized as an important part of the city's recreational infrastructure.

The project is not located in or near a coastal area under the jurisdiction of the Coastal Barrier Resources Act (CBRA) or the Coastal Barrier Improvement Act (CBIA).

Exhibit 4.4.6-1
Landward Coastal Boundary on Scajaquada Creek



Source: NYSDOS Office of Planning and Environment Website.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The work anticipated in the coastal zone waters is summarized in **Exhibit 4.4.6-2**. **Section 4.4.2** includes a discussion of potential impacts to Scajaquada Creek. **Exhibit 4.4.2-4** presents the preliminary impact quantities below ordinary high water for the Build Alternative, which includes those from the new bridge carrying the new Grant Street Connector over Scajaquada Creek. Based on the draft Nationwide Permit (NWP) reissuance for 2017 released in the Federal Register, this work would be covered under a Section 404, NWP 14 (Linear Transportation Projects) with a Preconstruction Notification (PCN). Since a Federal permit (Section 404 NWP 14) would be required, a Federal Coastal Assessment Form (FCAF) would be completed during the permitting process in final design.

In a letter dated September 9, 2016, the NYSDOS stated that it has determined that the project meets the NYSDOS's general consistency concurrence criteria (see **Appendix B1)**.

Exhibit 4.4.6-2
Proposed Work in Coastal Zone

Structure	Proposed Work	Work in Water
Bridge carrying Grant Street over NYS Route 198 and Scajaquada Creek (BIN 1039910)	No changes	None
Bridge carrying Ramp GF (Grant Street) over Scajaquada Creek (BIN 1039930)	Remove structure	Temporary work in water
Bridge carrying Ramp GE (Grant Street) over Scajaquada Creek (BIN 1039940)	Remove structure	Temporary work in water
New Bridge carrying new Grant Street Connector over Scajaquada Creek	New bridge	See **Exhibit 4.4.2-4**

The City of Buffalo Draft LWRP has not yet been approved by the NYSDOS; however, the Build Alternative is consistent with that program. The conversion of the Scajaquada Expressway to a boulevard or parkway is specifically listed as a proposal for continued and new land use. The Build Alternative would also be consistent with the intent of the program to improve recreation in the coastal area. The beneficial effects on recreation are discussed in **Section 4.4.12. Section 4.4.8** includes a discussion of how the Build Alternative would reduce impervious area and treat stormwater before entering Scajaquada Creek. Improvement of the water quality in Scajaquada Creek is also consistent with the City of Buffalo Draft LWRP.

4.4.7 Groundwater Resources, Aquifers, and Reservoirs

EXISTING CONDITIONS

Based on a review of mapping of aquifers on the NYSDEC website, the project area is not located over or near any NYSDEC primary or principal aquifers.[17] There are no mapped aquifers on the U.S. Geological Survey maps of unconsolidated aquifers shown on their Niagara sheet.

A review of the USEPA-designated Sole Source Aquifer Areas Federal Register Notices, Maps, and Fact Sheets indicates that the project is not located in a Sole Source Aquifer Project Review Area.[18] No federal

[17] The NYSDEC Technical and Operational Guidance Series (TOGS) 2.1.3 discusses the identification of certain groundwater sources as "Primary Water Supply Aquifer Areas" or "Principal Aquifer Areas" as part of "geographic targeting." This "geographic targeting" does not directly regulate such areas, but serves as a method for enhancing existing regulatory protection (such as SPDES, Section 401 Water Quality Certification, and the SEQRA process) in critical locations where the groundwater resource is most productive and most vulnerable. Technical and Operational Guidance Series 2.1.3. defines "Primary Water Supply Aquifers" as "highly productive aquifers presently utilized as sources of water supply by major municipal water supply systems." It defines "Principal Aquifers" as "aquifers known to be highly productive or whose geology suggests an abundant and high quality potential water supply, but which are not intensively used as sources of water supply by major municipal systems at the present time."

review and/or approvals are required pursuant to Section 1424(e) of the Safe Drinking Water Act. Public drinking water is provided to the project area by the Buffalo Water Authority and is sourced from Lake Erie. There are no municipal drinking water wells, wellhead influence zones, or reservoirs within or near the project area.

Hoyt Lake is located within the project area. It is recharged through the use of groundwater wells (see **Section 4.4.2**). Also, Scajaquada Creek is recharged in the Forest Lawn Cemetery by means of underground springs. None of these waters are suitable for drinking water.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would include appropriate erosion and sediment control practices (see **Section 4.4.8**). These measures would be designed to minimize contamination from highway runoff and construction activities. It is therefore not anticipated that the Build Alternative would result in adverse effects to the groundwater wells used to recharge Hoyt Lake. Also, the portion of the water aquifer that recharges Scajaquada Creek in the Forest Lawn Cemetery is up slope of the project area and would therefore not be exposed to project activities.

4.4.8 Stormwater Management

EXISTING CONDITIONS

The watershed area identified within the project area is Scajaquada Creek, which also contains sub-watershed areas for the adjacent Mirror and Hoyt Lakes. It is noted that Scajaquada Creek and Hoyt Lake ("Delaware Park Lake") are listed on the Final New York State 2014 Section 303(d) List of Impaired Waters Requiring a TMDL. Existing stormwater runoff from highway pavements in the NYS Route 198 corridor is either conveyed directly to Scajaquada Creek or collected in closed drainage systems. The existing closed drainage systems consist of drainage inlets and receivers in the median and at the edges of shoulders, connected by series of pipes. Additional details regarding the existing drainage system and drainage deficiencies in the current system are provided in **Section 2.3.3.4**. As the construction of NYS Route 198 predates the implementation of stormwater regulations, none of the stormwater that enters directly into Scajaquada Creek receives treatment.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

A stormwater analysis was prepared for the Build Alternative, and is provided in **Appendix B5**. For the Build Alternative, approximately 50 acres of post-construction disturbed impervious area and approximately 32.8 acres of post-construction roadway impervious area would drain into Scajaquada Creek, Mirror Lake, and Hoyt Lake. The post-construction roadway impervious area would be a reduction of 9.4% from the existing 36.2 acres of roadway impervious area. The preliminary values include all roadways and adjacent sidewalks and driveways disturbed for the project as part of the impervious area. There is an additional 3.2 acres of shared-use pathways being constructed for the Build Alternative. These pathways are not included in the impervious area calculations because bike paths and trails are exempt from meeting post-construction stormwater requirements per the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-15-002).

Site disturbance for the Build Alternative is calculated to be greater than one acre; therefore, a Stormwater Pollution Prevention Plan (SWPPP) would be required for compliance with the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-15-002). The project SWPPP document would include the

[18] The USEPA defines a sole source aquifer as one where: The aquifer supplies at least 50 percent of the drinking water for its service area and where there are no reasonably available alternative drinking water sources should the aquifer become contaminated.

following required components: Erosion and Sediment Control (E&SC) Plans; description of the reduction in stream channel erosion, application of runoff reduction via green infrastructure techniques, prevention of overbank flooding, control of extreme flood events (water quantity controls) and stormwater management practices to provide for pollutant removal (water quality controls). Post-construction stormwater measures are required to treat the impervious surfaces from the roadway portion of the project; however, the shared-use pathways are exempt from post-construction stormwater requirements. A detailed discussion of these required components is provided in **Appendix B5**.

The water quantity controls for the project would be waived because anticipated project redevelopment activities result in no increased stormwater runoff into Scajaquada Creek, Mirror Lake, and Hoyt Lake. Water quality controls for the project are determined using the water quality volume (WQv) calculation, which is based on rainfall amount, land cover type, and contributing area. It is assumed that the project would be constructed in two contracts (see **Section 3.3.1.7(5)**), and it is typically required that for each construction contract, the water quality treatment features be constructed in that contract, or possibly a prior contract that meets the requirements for that contract. The current proposed construction sequence includes Contract 1 (Elmwood Avenue Section and Delaware Avenue to Parkside Avenue Section) and Contract 2 (Grant Street Section).

Several water quality treatment areas have been identified to meet the water quality treatment volume requirements of the proposed activities. The proposed water quality treatments include wet swales, bioretention areas and hydrodynamic separators spread throughout the project corridor. Required WQv's were calculated for each construction contract, and **Exhibit 4.4.8-1** provides an approximate breakdown of water quality requirements and facilities provided assuming a two contract construction process. The approximate location of the potential water quality management areas, and detailed calculations are provided in **Appendix B5**.

Exhibit 4.4.8-1
Summary of Water Quality Volumes by Stage

Stage	Contract 1	Contract 2
Approximate Limits	Elmwood Avenue and Delaware Avenue to Parkside Avenue Sections	Grant Street Section
Water Quality Volume Required	*1.*09 ac-ft	*0.13 ac-ft*
Number of Facilities Provided	10	4
Facility Types	Hydrodynamic Separators	Bioretention Wet Swales
Water Quality Volume Provided	1.61 ac-ft	0.33 ac-ft
Net Water Quality Volume	+0.51 ac-ft	+0.20 ac-ft

The proposed hydrodynamic separators within Contract 1 would be designed to treat roadway runoff within the corridor and will be placed beneath the roadway or adjacent to the roadway, minimizing the need for additional right-of-way and impacts to the adjacent Delaware Park. The exact configuration of the devices would be determined during final design. The relatively shallow bedrock conditions in the project corridor (which is known to range between 7 and 14 feet below grade) is of concern for underground treatment. Borings and rock cores would be conducted during final design to ensure that

the proposed locations of the underground facilities would be constructible. The effects associated with potential adjustments to the hydrodynamic separators would be determined during final design.

Options for treating portions of impervious surfaces from the Buffalo State campus within the project corridor would be further investigated during final design. If reasonable, additional water quality treatment would be added to the western construction stage.

The project construction staging and sequencing has not yet been finalized, and as a result, the amount of disturbed area open at one time during construction has not been established. The E&SC Plan would include appropriate measures to address the final design. The NYSDEC has set regulations for Effluent Limitations for all projects covered under SPDES Permit No. GP-0-15-002 in New York State. These requirements are provided in **Appendix B5**.

ADDITIONAL STORMWATER QUALITY CONSIDERATIONS

Post-construction activities of the Build Alternative would decrease the number of lane-miles of roadways as well as decrease the amount of impervious surfaces in the project area (lane-miles are defined as the measure of the total length of traveled pavement surface, where lane-miles is the centerline length (in miles) multiplied by the number of lanes (not including walkways)). Please note that even though there would be a reduction in lane-miles for the Build Alternative, the number of travel lanes would be the same as the No-Build Alternative and existing conditions. Lane-miles and impervious area are variables used to determine water quality and quantity impacts associated with de-icing chemicals and highway pollutant loadings.

Exhibit 4.4.8-2
Summary of Roadway Lane Miles and Impervious Area

	Lane-Miles	Net Impervious Area, Ac
No-Build Alternative	16.2	36.1
Build Alternative	15.9	30.2
Percent Difference	-1.9%	-16%

Sodium and calcium chloride salts are used to maintain safe travel conditions during winter months. These de-icing salts reach surface water in the form of highway runoff and can affect the overall water quality of the Scajaquada Creek and Hoyt Lake drainage basins. The Toler Method is a predictive methodology that can be used to determine potential chloride concentrations in surface water from existing and anticipated salt applications on adjacent roadways (Toler, 1973).

The Toler Method was used to analyze runoff within the Scajaquada Creek watershed. Results indicate that the annual average chloride concentrations in runoff from the total project area would be 8.1 mg/L for the No-Build Alternative and 7.8 mg/L for the Build Alternative. The Toler Method was also used to analyze runoff within the Hoyt Lake watershed, which receives runoff from the eastern end of the project corridor. Even though overall there are less lane-miles under the Build Alternative as compared to the No-Build Alternative, the portion of the highway that drains to Hoyt Lake has 0.2 more lane-miles under the Build Alternative; therefore, the annual average chloride concentrations of runoff to Hoyt Lake would be slightly higher under the Build Alternative (4.4 mg/L for the No-Build Alternative and 4.6 mg/L for the Build Alternative).

Exhibit 4.4.8-3 Summary of Toler Method Chloride Concentrations		
Site Condition	**Average Annual Chloride Concentrations Scajaquada Creek – Entire Project Area (mg/L)**	**Average Annual Chloride Concentrations Sub Area Draining to Hoyt Lake (mg/L)**
No-Build Alternative	8.1	4.4
Build Alternative	7.8	4.6
Percent Difference	-3.7%	4.5%

Urban highway runoff includes many vehicular by-products, including metals, oil and grease, and soluble compounds formed by the combination of precipitation and vehicle exhausts. Potential water quality impacts may result from overland runoff that includes sedimentation, increased water temperatures and increased toxic substances, such as heavy metals, pesticides, oil and synthetic organic compounds. Many of these effects directly correspond to the amount of impervious paved road areas nearby. The "Simple Method" was utilized in providing gross analysis results of the No-Build Alternative and the Build Alternative, which are summarized in **Exhibit 4.4.8-4**. The summary is provided as a method of comparison of the No-Build Alternative and the reduction of each known pollutant, assuming that the remainder of the watershed remains unchanged.

Exhibit 4.4.8-4 Annual Pollutant Loading[(1)] Summary				
Pollutant	**No-Build Alternative**	**Build Alternative**	**Total Pollutants Removed By WQv Treatment**	**Total Reduction of Build from No-Build Alternative**
Total Suspended Solids (TSS)	37,316 lbs	33,798 lbs	17,582 lbs	57%
Total Phosphorus (TP)	84 lbs	76 lbs	41 lbs	59%
Total Nitrogen (TN)	788 lbs	714 lbs	136 lbs	27%
Copper (Cu)	14 lbs	13 lbs	2.3 lbs	25%
Lead (Pb)	105 lbs	95 lbs	--	9%
Zinc (Zn)	86 lbs	78 lbs	14 lb	26%

[(1)]Pollutant Concentrations are obtained from Table 2.1 "Natural Median Concentrations for Chemical Constituents in Stormwater," Chapter 2 of the New York State Stormwater Management Design Manual, 2015

Detailed analysis and calculations for additional stormwater quality considerations are provided in **Appendix B5**.

4.4.9 General Ecology and Wildlife Resources

4.4.9.1 Habitat Areas, Wildlife Refuges, and Wildfowl Refuges

EXISTING CONDITIONS

The study area for general ecology and wildlife resources included the project corridor and those areas immediately adjacent to the corridor.

Habitat Areas
Recent aerial photographs of the study area show the Scajaquada Creek corridor as a narrow band of naturalized riverine and riparian covertypes within the urban area of the City of Buffalo. Within the larger "green belt" made up by the park lawns, trees, and meadow covertypes of the adjacent Forest Lawn Cemetery, Delaware Park, and museum grounds, the riparian covertypes serve as a terrestrial and aquatic wildlife corridor.

The USFWS NWI mapping labels Scajaquada Creek within the study area as a riverine habitat as follows:

> "The Riverine system includes all wetlands and deepwater habitats contained in natural or artificial channels containing flowing water or which forms a connecting link between the two bodies of standing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System."

Scajaquada Creek is an urbanized stream that has been modified several times since the 1800s (see **Section 4.4.2**). It emerges in Forest Lawn Cemetery from an underground tunnel that carries the creek through the urban area to the east. The creek is channelized downstream of Hoyt Lake with banks that are hard-armored with rip-rap.

A field inspection identified six general habitat categories in the vegetated and aquatic covertypes. They include: mowed lawn, successional field, successional shrub, successional forested uplands, unconsolidated bottom riverine and emergent marsh. The majority of the vegetated areas inspected consisted of mowed lawn and specimen trees in the park areas and successional vegetation on the creek banks, while emergent marsh vegetation was found only in small areas at the water's edge. The study area includes impervious areas (as detailed in **Section 4.4.8**) and landscaped areas (as detailed in **Section 3.3.4**).

Aquatic Resources
The NYSDEC Region 9 Fisheries Bureau was contacted in May 2012 for an opinion on potential fisheries concerns in Scajaquada Creek. The response (see **Appendix B1**) indicates that some steelhead (rainbow trout) ascend Scajaquada Creek in the fall and winter months, presumably for spawning purposes. The response goes on to say that it is highly unlikely that any successful steelhead reproduction occurs in the creek. There may be some limited opportunity for fishing for steelhead; furthermore, there are likely opportunities for catching other fishes along the shoreline of the creek, including: carp, largemouth bass, sunfish and suckers.

Invasive Species
The site inspection identified monocultures of invasive vegetative species to be prevalent in several locations. European buckthorn and Japanese knotweed were seen in large colonies on the steep slopes of Scajaquada Creek, primarily in the portions of the corridor west of Elmwood Avenue.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would include a lower amount of impervious area (see **Section 4.4.8**) and a higher amount of landscaped area (see **Section 3.3.4**) compared to the No-Build Alternative. Construction of the Build Alternative would remove up to approximately 346 trees spread over 78 acres (see **Appendix B1**). Efforts would be made during final design to avoid tree removals, especially those trees deemed to be important in consideration of their size, species, state of health and location. There is minimal construction proposed in the stream, and the Build Alternative would not result in the creation of impassable barriers for steelhead migration or other aquatic life; therefore, fisheries are not likely to be adversely affected by the project.

Turf or landscaping would be established in areas where pavement is removed. In general, appropriate plantings would be installed throughout the corridor. Native plants would be utilized wherever possible, but plant survivability would be a key consideration. Measures would be taken to avoid and/or minimize disturbance to existing vegetation to remain within the construction limits. It is anticipated that the Build Alternative would provide more habitat for wildlife in the corridor. In a letter dated January 25, 2017 (see **Appendix I**), the USEPA recommended that NYSDOT mitigate the tree loss as much as possible by working with the Buffalo Olmsted Park Conservancy to determine if there are any other sites in the park that would be enhanced by the planting of native trees.

The Build Alternative would not contribute to the introduction, continued existence, or spread of invasive species. Construction of this alternative would require the removal of concrete and asphalt pavement and stripping of vegetation. The final design for the Project would include measures to restore disturbed areas with non-invasive materials, designed with future maintenance and ecological stability in mind. Standard construction methods, including reasonable measures and best management practices would be used to minimize the possibility of introducing or spreading invasive species during construction.

4.4.9.2 Endangered and Threatened Species

EXISTING CONDITIONS

The USFWS Information, Planning and Conservation (IPaC) database was reviewed in August 2016 for threatened and endangered species that have the potential to occur within the project area. The USFWS IPaC Trust Resources Report for the project area included one listed species, the northern long-eared bat (NLEB), *Myotis septentrionalis*. The IPaC Trust Resources Report is included in **Appendix B1**.

A review of the NHP database for the study area was conducted by NYSDOT in August 2016. According to the NYSDEC Natural Heritage information database, there is the potential for one historical state listed endangered plant species, which was last seen in 1898, and one historical state listed threatened plant species, which was last seen in 1930. The NHP also indicated the lake sturgeon, occurring in the open waters of Lake Erie, which is located upstream of the Niagara River's confluence with Scajaquada Creek and is outside the project limits.

Subsequent to this search, in a letter dated September 9, 2016, the NYSDEC NHP stated that it has no records of rare or state-listed animals or plans, or significant natural communities at the site or in the immediate vicinity. The correspondence may be found in **Appendix B1**.

Northern Long-Eared Bat

The NLEB is a federal and New York State listed threatened species. The range for the NLEB encompasses most of New York State. Summer roosting of NLEB occurs in trees and snags three inches in diameter at breast height (DBH) and larger. Thus, the removal of trees and snags three-inch DBH and greater is considered to have a potential to adversely affect the NLEB. According to USFWS and NYSDEC guidance, the risk of adverse effects to NLEB is substantially reduced if trees are removed during the winter (October 1 – March 31) when the bats are expected to have migrated to their winter

hibernaculum. Based on NYSDOT's August 2016 NYNHP database review, the study area is located more than 0.5 miles from a known hibernacula and more than 150 feet from known roost trees (USFWS required buffers) and more than five miles from a known hibernacula and more than 1.5 miles from known roost trees (NYSDEC required buffers).

Golden Dock

Golden dock (*Rumex fueginus*) is a New York State listed endangered plant species. The NYNHP database indicated that this species was last found on the site in 1898. Since then, the study area has been substantially disturbed and regularly mowed. Due to the historic nature of this plant species and the substantial disturbance that has occurred in the study area, the NYSDOT has determined that it is unlikely that this species would occur within the study area; therefore, "no take" of this plant species is anticipated. No further coordination with NYSDEC is required regarding this species.

Lake Sturgeon

Lake sturgeon (*Acipenser fulvescens*) is a New York State listed threatened species. The NYNHP database indicated that lake sturgeon are located in Lake Erie, which is upstream of the Niagara River's confluence with Scajaquada Creek and is outside the project limits. NYSDEC previously indicated that under current environmental conditions, lake sturgeon are highly unlikely to frequent the Scajaquada Creek. Based on the NYSDEC comment, no further coordination with NYSDEC is required regarding this species.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

A tree survey was performed within the study area to locate trees that are three inches DBH or larger. The tree survey was then compared with the areas proposed for disturbance from the Build Alternative to identify potential tree removals. It was determined that approximately 974 trees, including standing dead trees, are currently within the disturbance area (78.0 acres) and have the potential to be removed under the Build Alternative. Efforts would be made during final design to avoid tree removals, especially those trees deemed to be important in consideration of their size, species or state of health. Based on the proposed staging of the project (see **Section 3.3.1.7(5)**) which would occur over two more years, it is anticipated that the trees could be cut outside the winter hibernation period, which may affect the NLEB. However, tree-cutting would not occur during pup-rearing season from May 1st through July 31st. A table listing potential tree removals is included in **Appendix B1**.

The potential effects on the NLEB have been determined using the FHWA–NY ESA Section 7 Process established with the USFWS for federal-aid projects. This determination process requires the completion of several documents for a submission package to USFWS. Completed documents include the Suitable Habitat Assessment Form for Trees (SHAFT), the NLEB Consultation Form (30-Day Form) and the ESA Transmittal Sheet. A copy of this package is included in **Appendix B1**. In a letter dated October 11, 2016 (see **Appendix B1**), the FHWA noted that it had reviewed and forward the documentation to the USFWS on September 7 for their independent review, and 30 days have passed with no response, and the FHWA concurs with the recommendation that the project "May Affect, but is Not Likely to Adversely Affect" the Northern long-eared bat.

According to USFWS guidance, structures such as bridges have the potential to provide summer roosting habitat for NLEB. Therefore, as specified in the guidance, a bridge/bat inspection would be conducted within one year prior to work on a bridge to confirm whether NLEB are present. If bats, or evidence of bats, are found, USFWS and NYSDEC would be consulted to determine the species present before work begins.

The Build Alternative would not directly affect the Niagara River or the major waterfowl feeding areas noted in the river, the nearest of which is located downstream between Motor Island and Strawberry Island.

With regard to the historical state listed endangered plant species identified in the 2016 NHP plant review,

the property along NYS Route 198 has been previously disturbed and is regularly mowed. Due to the historical nature of these plants and the previously disturbed nature of the project area, it was determined that the Build Alternative would have no impacts to state threatened or endangered plant species.

Therefore, other than the NLEB, it was determined that this project would have "No Effect" on any other state listed species. Furthermore, pursuant to 6 NYCRR Part 182, NYSDOT determined that the proposed activity is not likely to result in the take or taking of the NLEB and therefore, is not subject to regulation under this Part.

4.4.10 Critical Environmental Areas

According to lists of State Critical Environmental Areas on the NYSDEC website, there are no Critical Environmental Areas[19] designated within the City of Buffalo.

4.4.11 Historic and Cultural Resources

The project is subject to review pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations, 36 CFR Part 800: *Protection of Historic Properties*. This review also satisfies the requirements of the New York State Parks, Recreation and Historic Preservation Law, Section 14.09.

Section 106 of the NHPA requires federal agencies to consider the effects of their actions on properties listed in or determined eligible for listing in the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings.

The Section 106 process for the Build Alternative included:

- Definition of the Area of Potential Effects (APE) for the Build Alternative
- Identification of historic properties in the APE
- Evaluation of effects on the identified historic properties within the APE
- Consideration of measures to avoid and minimize adverse effects
- Documentation of an effect finding
- Consultation to resolve adverse effects

Participants in the Section 106 process included the New York State Historic Preservation Office (SHPO), FHWA, NYSDOT, Seneca Nation of Indians, Tonawanda Seneca Nation, Seneca Cayuga Nation of Oklahoma, and other Consulting Parties approved by the FHWA. Correspondence documenting Section 106 consultation is provided in **Appendix B6**.

[19] Local agencies may designate specific geographic areas within their boundaries as "Critical Environmental Areas" (CEAs). State agencies may also designate geographic areas they own, manage or regulate. To be designated as a CEA, an area must have an exceptional or unique character with respect to one or more of the following:

- a benefit or threat to human health;
- a natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality);
- agricultural, social, cultural, historic, archaeological, recreational, or educational values; or
- an inherent ecological, geological or hydrological sensitivity to change that may be adversely affected by any change.

APE for the Build Alternative

The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR § 800.16[d]). The APE for the Build Alternative is depicted in Attachment A to the Section 106 Finding Documentation (August 18, 2016) in **Appendix B6**. The APE for direct effects extends approximately 2.3 miles along NYS Route 198 from just west of Grant Street to the NYS Route 5 (Main Street) overpass. It incorporates the limits of ground disturbance associated with the project's construction-related activities. Within Delaware Park, the direct effects portion of the APE incorporates the proposed locations of shared-use paths (see **Section 3.3.2.1**). The APE for indirect effects includes areas associated with the introduction of visual elements in the setting and viewshed of identified historic properties.

Identified Historic Properties in the APE

The NYSDOT obtained information on properties listed in the NRHP through the Office of Parks, Recreation and Historic Preservation's Cultural Resource Information System (CRIS), and from staff in the Division for Historic Preservation, Archaeology and National Register Units. Previously evaluated historic properties within or partially within the APE include:

- Delaware Park - listed in the National Register under Criterion C in the area of landscape architecture, as a component of the Delaware Park-Front Park System, an element of the Olmsted Parks and Parkway Thematic Resources in the City of Buffalo, Erie County.
- Lincoln Parkway - a component of the Delaware Park-Front Park System.
- Lincoln Parkway Bridge (BIN 2260460) - a Neo-Classical stone bridge built in 1900 and a contributing resource within Delaware Park.
- Parkside East Historic District - listed in the National Register under Criteria A and C in the areas of architecture, community planning and development, and landscape architecture. Contributing resources include Agassiz Circle (contributing streetscape), the ca. 1906 residence at 23 Agassiz Circle, and the ca. 1910 residences at 17 Parkside Avenue.
- Parkside West Historic District - listed in the National Register under Criterion C under architecture and landscape architecture. Both the Parkside East and Parkside West Historic Districts are additional components of the Olmsted Parks and Parkways Thematic Resources.
- Albright-Knox Art Gallery (1285 Elmwood Avenue) - listed under Criterion C in the areas of architecture and art.
- Forest Lawn Cemetery - listed under Criterion C in the areas of landscape architecture, architecture, sculpture, and funerary art.
- Spirit of Womanhood Statue - individually eligible under National Register Criterion C as the work of a master. The statue is located within Delaware Park, but is not a contributing resource.
- Rockwell Hall at Buffalo State College, 1300 Elmwood Avenue – National Register eligible
- Properties on Meadowview Place, Agassiz Circle, and Humboldt Parkway - determined eligible as part of the proposed Agassiz Circle Historic District

A series of cultural resource surveys identified archaeological resources within the APE for the Project, including both Native American occupations dating to the Precontact period, and historic land use pre-dating the construction of the park in the 1870s. In consultation with the SHPO, nine (9) archaeological sites were determined individually eligible for the NHRP under Criterion D for their potential to yield information important in history or prehistory. Archaeological sites located within Delaware Park do not contribute to the characteristics that qualify the park for the NRHP.

Assessment of Effects on Identified Historic Properties

The Build Alternative includes a number of physical changes associated with direct and indirect effects to Delaware Park and other identified historic properties within the APE for the project.

Measures to Avoid and Minimize Adverse Effects

The Scajaquada Expressway, as it currently exists, is paved with wide shoulders, interchanges and limited pedestrian connectivity between either side of the park. It is considered to be at odds with its rich cultural and recreational surroundings, acting as a physical barrier between the two sides of Delaware Park and adjacent land uses. Consistent with the project objective to enhance the compatibility of the roadway with the unique characteristics of Delaware Park and adjacent land uses, the Build Alternative incorporates elements designed to retain the historic character and integrity of Delaware Park and other historic properties.

- The Build Alternative would remove existing features, such as ramps, grade separations, overhead sign structures, median barriers, interchanges, and other typical expressway features.
- Ramps at Grant Street, Elmwood Avenue, and Delaware Avenue would be replaced with connecting roadways.
- Signalized intersections or roundabouts would be constructed where each connecting roadway meets NYS Route 198.
- New bicycle and pedestrian accommodations, as well as improved links to the existing pedestrian and bicycle features within the park, corridor and the surrounding communities, would be incorporated.
- Safety barriers would be installed along NYS Route 198 to prevent vehicles from encroaching into the park.
- Existing overhead and other expressway-style signs within the project limits would be removed and replaced with ground mounted signs. Overhead signing would be restricted to lane use and street name applications, primarily at signalized intersections and crossing. A corridor-wide approach to signing would be explored during detailed design to promote consistency and aesthetics.
- On NYS Route 198, the existing lights, poles and arms would be removed and replaced with ornamental lighting to match those recently installed on the bridge carrying Elmwood Avenue over NYS Route 198 and other roadways within the vicinity of Delaware Park.
- The proposed bicycle and pedestrian network incorporates a 10-foot wide shared-use path and 5-foot wide pedestrian path that follow the layout and alignment of the Olmsted-designed circulation system in the park, where possible (see the 1899 General Plan for Delaware Park, in Attachment D to **Appendix B6**).

- To minimize the effects of potential tree removals within the area of disturbance for the Build Alternative in Delaware Park, new plantings would be consistent with Olmsted design principles and plant materials, as determined in coordination with the BOPC.

The construction of the proposed intersections and crossings to improve access to Delaware Park and between the two sides of Delaware Park would require approximately 1.7 acres of green space in the park. In addition, the Build Alternative would involve the purchase of right-of-way to establish a highway boundary where none currently exists through the eastern portion of the park, and would include permanent easements to maintain highway drainage structures within the project limits (approximately 1.0 acres). However, the project would also include the removal of approximately 5.6 acres of existing roadway use, which includes approximately 2.0 acres of pavement and hardscape, returning the land to green space within Delaware Park, resulting in a net increase of approximately 2.9 acres to the park.

The minor acquisition of land within Delaware Park would not diminish the integrity of location, design, setting, feeling, or association of the National Register listed property. In addition to the net increase in green space, the right-of-way acquisition would be offset by the beneficial effects resulting from the removal of existing expressway features from the park.

On Parkside Avenue and at the northeast quadrant of Agassiz Circle, the reconstruction of the sidewalk on its existing location could require minor temporary easements from residential properties that are contributing resources within the Parkside East Historic District. Activities associated with the proposed temporary easements of 0.02 acres at 23 Agassiz Circle and 0.01 acres at 17 Parkside Avenue would not alter the characteristics that qualify these properties as contributing resources, and would not affect the integrity of the National Register Listed historic district as a whole.

As an objective of the project (see **Section 1.2.2**), the Build Alternative would improve connectivity between both sections of Delaware Park on either side of NYS Route 198, and between the park and adjacent neighborhoods. Non-vehicular travel to and within the park would be improved as a result of the proposed new pedestrian crossings, connecting roadways and pedestrian/bicycle network that would provide safe access from the residential neighborhood represented by the Parkside East Historic District.

A part of Olmsted's comprehensive master plan for parks and parkways in the City of Buffalo (1876), the Parkside subdivision was designed as a buffer between the green space of Delaware Park and urban development beyond, "… to provide an ideal residential environment, partaking of the aesthetic amenities of adjacent public parkland" (National Register of Historic Places Inventory-Nomination Form, 1986: Item no. 4, p. 1). As a result of substantial connectivity improvements between the two sides of Delaware Park and improved access to the entire park from the surrounding communities, the Build Alternative would enhance the historical association between Delaware Park and the Parkside District, and the setting of Delaware Park within the context of Olmsted's master plan.

Identified historic properties that are subject to indirect visual effects consist of Delaware Park, Rockwell Hall at Buffalo State College, the Albright-Knox Art Gallery, the Buffalo History Museum, the Parkside Subdivision (West) Historic District, Forest Lawn Cemetery, the Parkside Subdivision (East) Historic District and residential buildings on Meadowview Place, Agassiz Circle and Humboldt Parkway. The visual effects to the setting or viewshed of these historic properties are associated with the removal of existing expressway infrastructure and features within the NYS Route 198 corridor, the construction of a new pedestrian bridge over Scajaquada Creek and the Jesse Kregal Pathway at the western end of Delaware Park and construction on Iroquois Drive, NYS Route 198 and Parkside Avenue.

These changes would not alter contributing features of the setting or diminish the integrity of location, design, materials, or setting of identified historic properties. As a result of the Build Alternative, proposed changes associated with the NYS Route 198 corridor would result in positive visual impacts to historic properties adjacent to the Scajaquada Expressway Corridor, compared to existing conditions.

Adverse Effect Finding

In coordination with the FHWA, the NYSDOT documented the assessment of effects on historic properties in accordance with the documentation standards outlined in 36 CFR §800.11(e). Applying the *Criteria of Adverse Effect* (36 CFR § 800.5(a)(1)) the *Section 106 Finding Documentation* (August 18, 2016, **Appendix B6**) concluded that the project would have an "Adverse Effect" as a result of anticipated damage or destruction of identified archaeological properties within the APE

The NYSDOT provided the Section 106 Finding Documentation to the SHPO, the Seneca Nation of Indians, Tonawanda Seneca Nation, Seneca Cayuga Nation of Oklahoma, and other Consulting Parties as an opportunity for review and comment. The SHPO concurred with the finding that the project would have an Adverse Effect on archaeological sites, stating that "A review of the submitted material demonstrates that alternatives have been explored that might avoid or minimize these affects" (August 30, 2016, **Appendix B6**). Subsequent to this consultation, the NYSDOT in coordination with FHWA provided the SHPO with updated project information, providing an opportunity for input on minor design modifications and refinements (November 1, 2016). By letter dated November 3, 2016, the SHPO agreed that the proposed changes to the project, as outlined in the November 1st letter, "will not alter or impact any of our previous consultation of determinations for this undertaking." (November 3, 2016, **Appendix B6**).

Based on the concurrence of the SHPO and views of Consulting Parties, the FHWA formally issued an Adverse Effect determination for the undertaking in a letter dated November 3, 2016. The FHWA notified the Advisory Council on Historic Preservation (ACHP) of the adverse effect finding, provided the required documentation, and formally invited the ACHP to participate in the Memorandum of Agreement (MOA) for the undertaking. By letter dated November 16, 2016, the ACHP responded to the FHWA, declining to participate in consultation for the resolution of adverse effects (**Appendix B6**).

Subsequent to the publication of the DDR/DEIS for the project, the NYSDOT amended the Finding Documentation to address additional design modifications based on a consideration of public comments (April 21, 2017, **Appendix B6**). Modifications to the center median treatments, crosswalks, bicycle and pedestrian network, Delaware Park entrance, and Agassiz Circle will improve connectivity with no increase in the overall project footprint, and no additional adverse effects to historic properties. Due to the previously identified impacts to archaeological sites, the existing Adverse Effect determination for the project remains valid. This was submitted to the SHPO in an email dated April 21, 2017. In a reply email dated May 9, 2017, the SHPO concurred with the findings of the minor amendments to the project.

Resolution of Adverse Effects

A Draft Memorandum of Agreement (MOA) was developed among the FHWA, SHPO and NYSDOT to resolve adverse effects on National Register eligible archaeological sites identified within the APE for the project. The Draft MOA was distributed to Section 106 Consulting Parties for review, and was made available to the public as part of the DDR/DEIS for the project. In the absence of Consulting Party and public comments, the FHWA, in coordination with NYSDOT, prepared the Final MOA with the following minor changes:

- Scajaquada Site 14 was removed from the title, since the site will be avoided and not subject to Data Recovery; and
- A Whereas clause discussing Scajaquada Site 11 was moved so that it now immediately follows the Whereas clause that discusses the Scajaquada 14 site.

Consulting Parties were provided an opportunity to sign the agreement as concurring parties in letters dated May 17, 2017.

In consultation with the Seneca Nation, the Tonawanda Seneca Nation, and the Seneca Cayuga Nation of Oklahoma, data recovery was determined to be an appropriate treatment to mitigate the project's adverse effects on archaeological sites. The NYSDOT, in coordination with FHWA, solicited input from

the SHPO and the Nations on a Data Recovery Plan, prepared by qualified professional archaeologists in accordance with established standards.

In a letter dated September 21, 2017, the FHWA transmitted a copy of the fully executed MOA, noting that the requirements of 36 CFR Part 800 have been satisfied for this project and that the Section 106 process is compete. The executed MOA is provided in **Appendix B6**.

Public Involvement

Section 1.7.2 summarizes public involvement activities for the project. Pursuant to 36 CFR § 800.6(a)(4), the public has been notified of the project's adverse effects on historic properties through the publication of the DDR/DEIS, and provided an opportunity to express their views as part of the public review of the environmental document.

4.4.12 Parks and Recreational Resources

This section was prepared in accordance with the following regulations and programs intended to protect parkland:

Section 4(f): Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (now 49 USC §303) prohibits the Secretary of Transportation from approving any program or project that requires the use of: (1) any publically owned land in a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or (2) any land from a historic site of a national, state, or local significance (collectively, "Section 4(f) resources"), unless there is no feasible and prudent alternative to the use of such land and all possible planning has been undertaken to minimize harm to the 4(f) resource. A Section 4(f) Evaluation is provided in **Chapter 5** of this DDR/DEIS.

Niagara River Greenway Plan: The Niagara River Greenway is a linear system of State and local parks and conservation areas linked by a network of multi-use trails within the greenway area established by the Niagara River Greenway Plan ("Greenway Plan") of the Niagara River Greenway Commission. The Greenway boundary follows municipal lines and encompasses the municipalities of Porter, Youngstown, Lewiston (Town and Village), Niagara, Niagara Falls, Wheatfield, North Tonawanda, Grand Island, Tonawanda (City and Town), Kenmore and Buffalo.

The vision of the Greenway Plan is to promote an ecologically sustainable and accessible area of conservation value that provides connections to related corridors and resources across the region. The Greenway is a means to establish a clear sense of "place" and identity that reflects the traditional spirit and heritage of the area. The goals of the Greenway Plan are to:

- Promote public access to the Greenway through the development of multi-use trails, water-based trails, waterfront access points, scenic overlooks, and interpretive centers;
- Promote physical connections that link destinations and communities;
- Protect and restore environmental systems for environmental purposes and promote the future revitalization of the region's economic health;
- Celebrate the region's shared history and heritage through consistent signage and way-finding systems, interpretive centers, and thematic frameworks for coordination of interpretive activities;
- Spark revitalization, reinvestment, and renewal in the cities and communities along the Greenway through sustainable development, tourism, and improved quality of life factors;
- Promote long-term sustainability through rehabilitation and improvement of aging facilities to ensure their long-term viability and world-class stature; and
- Extend Olmsted's legacy by achieving Olmsted's vision of a necklace of parks and open spaces along the length of the Niagara River.

Section 1010: The Urban Park and Recreation Recovery Act (UPARRA) of 1978 (16 USC §2501) was created by Congress to "assist physically and economically distressed urban jurisdictions to revitalize their recreation systems, and to enhance overall recreation opportunities through the use of existing and potential recreational resources." Under UPARRA, conversion of existing parkland that has received UPARRA funding to a non-park use can be granted by DOI through National Park Service only if alternatives have been evaluated and steps are taken to identify, evaluate, and supply replacement parkland. The City of Buffalo has also received a total of $2,225,500 from the Urban Park and Recreation Recovery Program. The funds were used for Cazenovia Park, Lasalle Park and Massachusetts Avenue Park. None of these parks are located near the study area.

Section 6(f): Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 (now 16 USC § 460i-4) requires that any property acquired and/or developed with LWCF funds remain forever available for public outdoor recreation use or be replaced by lands of equal market value and recreational usefulness. The U.S. Department of the Interior (DOI), through the National Park Service (NPS), provides funding under the LWCF program for state and local efforts to plan, acquire, or develop land to advance outdoor recreational activities. The New York State Office of Parks, Recreation, and Historic Preservation (NYS OPRHP) serves as the New York State agency that administers LWCF funds received from DOI. Using LWCF funds creates certain limitations on future changes to the LWCF-funded projects. Once LWCF funds are used for a particular recreation project, that recreational facility cannot be converted to non-recreational use, either wholly or partially (either permanently or on a temporary basis for greater than six months) without approval from NPS in accordance with the requirements of Section 6(f).

The project is located within Delaware Park, which has received LWCF grants (**Exhibit 4.4.12-1**). The Delaware Park boundaries are depicted on the 1976 Delaware Park Comprehensive Development Plan (**Exhibit 4.4.12-2 in Appendix B1**).

Exhibit 4.4.12-1
LWCF Grants for Delaware Park

Grant Element Title	Amount	Date Approved
Delaware Park Improvements	$ 460,710.00	12/14/1977
Buffalo Zoo Improvements	$ 238,150.00	1/17/1978
Pedestrian Zoo Walkway	$ 47,317.00	2/3/1979
Buffalo Zoo Center Court	$426,750.00	9/21/1983
Delaware Park Lake Shoreline Phase 1	$50,000.00	4/24/1985

EXISTING CONDITIONS

Delaware Park was designed by Frederick Law Olmsted, Sr., who was the designer of New York City's Central Park. It was originally called "The Park." It was known as Buffalo's own "Central Park" and is considered by the Buffalo Olmsted Parks Conservancy to be the centerpiece of the Buffalo Olmsted Park System. The 350-acre park is the largest of six major parks in Buffalo's Olmsted Park System, which also includes multiple parkways, circles and small spaces. The system was listed in the National Register of Historic Places in 1982 as a cultural landscape, specifically a "historic designed landscape" (See **Section 4.4.11**). Notable features of the park include:

- Parkside Lodge
- Marcy Casino
- Hoyt Lake
- Rumsey Woods
- Rose Garden
- The Ivy Bridge
- Japanese Garden

Delaware Park facilities include an 18-hole golf course, baseball/softball diamonds (3), football/soccer/ rugby fields (6), lawn bowling courts (2), tennis courts (17), basketball courts (4), playgrounds (3), picnic tables (17), and picnic shelters (1).

The Friends of the Olmsted Parks was founded in 1978 to preserve and promote Buffalo's Olmsted Parks System. It has since become the non-profit organization, "Buffalo Olmsted Parks Conservancy" (BOPC). In 2004, Erie County and the City of Buffalo contracted with the BOPC to become the official steward of Buffalo's Olmsted Parks System. In January 2008, the BOPC produced, *The Olmsted City, The Buffalo Olmsted Park System: Plan for the 21st Century*. This plan describes the BOPC's goal to restore the historic landscape of the Olmsted Parks System. The plan lists the following goals for restoration of Delaware Park:

- Reconnect the fragments of the park
- Restore the historic integrity of the park from the period of significance
- Restore Gala Waters and other water features
- Improve or rationalize recreation and services by balancing unstructured recreation with structured recreation
- Improve access and circulation within the park for vehicles and pedestrians
- Establish connections to areas surrounding the park
- Restore the basic park elements

NYS Route 198 was constructed in several stages (separate projects) during the 1950s through the City of Buffalo's Delaware Park, following the same general alignment as the former park road. The easternmost section is located within Delaware Park and was constructed in 1952 under a contract identified as the "Humboldt Parkway Extension Arterial," which connected the City of Buffalo's Humboldt Parkway from its terminus at Parkside Avenue westward to Delaware Avenue. Right-of-way was not acquired from the City of Buffalo for this first section of highway through Delaware Park.

Subsequent contracts in 1958 and 1959 connected the "Humboldt Parkway Extension" project westward to I-190 and completed the facility that exists today as Scajaquada Expressway. The NYSDOT acquired highway right-of-way for the 1958 expansion of the Scajaquada Expressway through the adjacent portion of Delaware Park; however, NYSDOT did not acquire right-of-way for portions of the expressway previously constructed through the eastern portion of the park. Thus, the western portion of the expressway in Delaware Park, beginning just west of the Delaware Avenue interchange and extending westward, lies on highway right-of-way owned by New York State, while the eastern portion is located within an operational right-of-way with no official ownership boundaries (see **Exhibit 4.4.12-3** in **Appendix B1**).

To the west of Delaware Park, from the 1976 boundary of Delaware Park and on the north side of the expressway, there is an area owned by the City of Buffalo, which was established in 2001 as the Olmsted Parks and Parkways Local Preservation District (see **Exhibit 4.4.12-3** in **Appendix B1**).[20] The Jesse Kregal Pathway is located in this area. The pathway is a 2.4-mile shared-use path along the north side of Scajaquada Creek that connects Delaware Park with the Niagara River Greenway (known as the "Riverwalk" in the City of Buffalo).

In order to establish operational right-of-way limits in areas where right-of-way was not officially acquired in 1952 from the City of Buffalo, the highway right-of-way boundary lines acquired under the 1958 contract and design standards at that time were evaluated. The typical dimensions and offsets from the 1958 project were then applied to the 1952 section of the highway in order to determine the operational right-of-way limits. Where applicable, consideration was given to constraining features within the park, such as tennis courts, a park road, and the City of Buffalo Park Maintenance Facility.

[20] The park boundary is discussed in detail in "Potential Effects: Build Alternative."

The right-of-way width to the west of the Delaware Avenue interchange (1958 contract) varies depending on location, but can be characterized by a typical width of 120 feet, or 60 feet from the roadway centerline on each side of the roadway. Features included within this right-of-way include curbs and pavement, center median, median barrier and guiderail, closed drainage system, bridges and overhead sign structures.

To establish the operational right-of-way limits for the eastern portion of the Scajaquada Expressway, assumed highway boundary lines 60 feet off the centerline were placed on each side of the expressway based on the typical (1958 contract) right-of-way width of 120 feet. The operational right-of-way width was reduced in areas to exclude adjacent features including the Delaware Park Comfort Station, South Meadow Drive, the City of Buffalo Radio Tower, and the City of Buffalo Parks Maintenance Facility. As a result, the operational right-of-way limits generally fall between 52 and 60 feet from the centerline of the expressway, and 17 to 24 feet from the existing curb.

Operational right-of-way limits at the Delaware Avenue interchange were created by setting a line 15 feet off the face of curb and then striking best-fit tangents to simulate the highway boundary lines at ramps, as established by the NYSDOT to the west of Delaware Avenue under the 1958 contract. Areas within on-off ramps that are not accessible to park users were considered to be within the operational right-of-way.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

Niagara River Greenway Plan

The project is located along a key linkage to the Niagara River Greenway (Scajaquada Creek and Delaware Park). As such, the NYSDOT has completed a Niagara River Greenway Commission Consistency Review Form for this project. A summary statement of the consistency screening is included below.

The proposed project supports the Niagara River Greenway Plan. Specifically, the proposed project is consistent with the *Greenway Principles*. In addition, the project is consistent with several initial priorities for the Greenway, including improved access to waterfront access, development of an integrated trail and park system, and restoration of the Niagara River ecosystem. The project improves waterfront access through the addition of shared-use paths that connect the Niagara River Greenway with Hoyt Lake, Mirror Lake, and Scajaquada Creek. The project helps to restore the Niagara River ecosystem through improved water quality, as described in **Sections 4.4.2** and **4.4.8,** and through additional landscaping as described in **Section 4.4.9.** The project helps to establish strong linkages between the Greenway focus area and the surrounding area. This is also accomplished through the additional crossings of NYS Route 198 and through additional shared-use paths as documented in **Section 3.3.2**. Finally, the project takes into consideration other planning efforts, including the City of Buffalo's Comprehensive Master Plan, LWRP, and 'Complete Streets' policy, the SUNY Buffalo State University Facilities Master Plan, and various plans by the Olmsted Parks Conservancy, NYSDEC, Forest Lawn Cemetery, and other private developments.

A copy of the Niagara River Greenway Consistency Review Form is included in **Appendix B1**.

Section 6(f) of the LWCF Act

The Delaware Park boundaries, as filed with the NPS, are depicted on the 1976 Delaware Park Comprehensive Development Plan (**Exhibit 4.4.12-2** in **Appendix B1**) and were used to evaluate effects under Section 6(f). In a meeting on March 14, 2016 with FHWA, NPS, NYS OPRHP and NYSDOT, it was agreed that the area for the conversion process would include both the Delaware Park boundary of 1976 and the Olmsted Parks and Parkways Local Preservation District of 2001 as shown on **Exhibit 4.4.12-3** in **Appendix B1**. It was determined at the meeting that the areas within the existing right-of-way and the operational right-of-way are being used for transportation purposes. **Exhibit 4.4.12-3** in **Appendix B1**

illustrates the parkland boundaries along with the established highway right-of-way and the operational right-of-way.

Under the LWCF Act and applicable federal Department of the Interior regulations (36 CFR Part 59), conversion of parkland may be approved only if NPS finds that the following nine criteria have been met:

1. All practical alternatives to the proposed conversion have been evaluated;

2. The fair market value of the park property to be converted has been established and that the property proposed for substitution is of at least equal fair market value, as established by an approved appraisal in accordance with the Uniform Appraisal Standards for Federal Land Acquisition, excluding the value of structures or facilities that will not serve recreational purposes;

3. The proposed replacement property is of reasonably equivalent usefulness and location as the converted property;

4. The property proposed for substitution meets the eligibility requirements for LWCF-assisted acquisition;

5. For properties that are proposed to be partially rather than wholly converted, the impact of the converted portion on the remainder must be considered and the unconverted area must remain recreationally viable, or be replaced as well;

6. All necessary coordination with other federal agencies has been satisfactorily accomplished, including compliance with Section 4(f) of the U.S. Department of Transportation Act of 1966;

7. The guidelines for environmental evaluation have been satisfactorily completed and considered by the National Park Service during its review of the conversion proposal;

8. If the proposed conversion constitutes a significant change to the original LWCF project, State intergovernmental clearinghouse review procedures have been adhered to; and

9. The proposed conversion is in accordance with the applicable Statewide Comprehensive Outdoor Recreation Plan (SCORP) and/or equivalent recreational plans.

These criteria were evaluated and are discussed below.

1. Alternatives to Conversion of Section 6(f) Land

As discussed in Chapter 3 of this FDR/FEIS, several alternatives were considered during the scoping process of this project and subsequently dismissed from further study. One of these was called, "**Alternative 4: Removal between Elmwood Avenue and Parkside Avenue**." This potential alternative would involve the removal of NYS Route 198 from Delaware Park. Two stubs of the existing roadway would remain: the first would extend from I-190 to Elmwood Avenue and the other would connect Parkside Avenue with NYS Route 33.[21] Traffic analyses were conducted in cooperation with the GBNRTC using its calibrated regional travel demand model. The model was used to predict changes in traffic patterns that would occur as a result of this potential alternative. The model predicted that large traffic volumes would be diverted to local roadways. Increased traffic on the local street system during rush hour would cause local intersections to operate inefficiently, resulting in congestion, delay, and potential air quality impacts. Mitigating these impacts would, in turn, impact established homes, businesses, and neighborhoods. This potential alternative would not be practical because:

[21] Conceptual plans for this alternative appear in Appendix D of the Scoping Document.

- It would not meet the stated purpose of maintaining a critical transportation link between I-190 and NYS Route 33,
- It would result in unacceptable operational problems, and
- It has a potential for adverse social and economic impacts.

The **No-Build Alternative** would not require conversion of parkland. This would not be practical as the No-Build Alternative would not meet the stated purpose, need, and objectives for the project.

Only one reasonable alternative was identified in the scoping process that met the project's purpose and objectives: the **Build Alternative**. The Build Alternative has been developed and designed to minimize, to the greatest extent practicable, the need to acquire parkland. Since parkland is present immediately adjacent to both sides of the roadway, it was not possible to completely avoid the conversion of parkland, as some parkland would still be required for minor alignment shifts needed to optimize the geometry for traffic calming; provide a buffer near the tennis courts; for the reconfiguration of interchanges into intersections; and for permanent easements for drainage structures.

As described in Chapter 3, the Build Alternative would convert the current urban expressway into an urban boulevard with a posted speed limit of 30 miles per hour. The new roadway would include traffic calming measures and decrease the overall footprint of the paved surface by removing paved shoulders and constructing a hardscaped center median (planted in locations where the medians will be wider), for example at the Grant Street roundabout and, as appropriate, at intersections opposite turn lanes. The Build Alternative would sign NYS Route 198 as a bicycle route and result in 5-foot wide shoulders that could be used along with the travel lanes by commuter bicyclists. Additional landscaping improvements would also be incorporated throughout the corridor. These improvements would address safety concerns and multimodal deficiencies, enhance context sensitive elements throughout the corridor, and be designed to incorporate features consistent with Olmsted's principals within Delaware Park, as appropriate.

The Build Alternative would have a beneficial effect for use of the park by pedestrians and bicyclists. A combination of new and existing shared-use paths (10 feet wide) and footpaths (5 feet wide) would provide continuous accommodation along NYS Route 198 from Grant Street to Parkside Avenue. Six new crossing opportunities would be added along the project corridor, including at Buffalo State College (connecting to the Jesse Kregal Pathway), Elmwood Avenue, Lincoln Parkway, Hoyt Lake, Delaware Avenue and at the Buffalo Parks Maintenance Facility. These crossings, in addition to four existing grade separated crossing opportunities and two improved at-grade crossings at Parkside Avenue, would provide pedestrians with 12 different opportunities to cross NYS Route 198.

Highlights of some of the pedestrian features include:

- New shared-use paths and footpaths within Delaware Park would follow the alignment of historic park pathways to the greatest extent practical.

- New pedestrian crossings would improve access between both sides of the parkland and would provide access to areas previously not readily accessible.

- Removing the highway interchanges and replacing them with at-grade intersections improves connections for pedestrians

- A direct connection between the paths along NYS Route 198 and the Jesse Kregal Pathway would be provided using the Elmwood Avenue Connector.

- A direct connection between Buffalo State College and the Jesse Kregal Pathway would be provided over NYS Route 198 and Scajaquada Creek.

- A new segment of path, passing over Scajaquada Creek along with NYS Route 198 in the vicinity of Hoyt Lake and Mirror Lake, would improve the pedestrian experience within the Japanese Gardens by providing a bypass for other pedestrians and bicyclists.

Additional details regarding these features are available in **Section 3.3.2**.

The Build Alternative is consistent with the BOPC's plan, *The Olmsted City, The Buffalo Olmsted Park System: Plan for the 21st Century*. In particular, the Build Alternative would remove ramps and provide new areas for park use; (see **Section 3.2.1**); construct pathways in the park along their approximate historic alignments (see **Section 3.3.4.1**); and reduce impervious area (see **Section 4.4.8**).

Exhibit 4.4.12-4 in **Appendix B1** illustrates the areas that have been determined to be within the existing highway boundary or operational right-of-way and would be available for park use after the Build Alternative is completed (approximately 5.6 acres). The graphic also shows areas currently available for park use that would be used for intersections, crossings and slight alignment shifts to improve access to Delaware Park and between the two sides of Delaware Park (approximately 1.7 acres). Proposed permanent easements would also be needed to maintain highway drainage structures within the project limits (approximately 1.0 acre). This would result in a net benefit, or increase in the area that would be changed from highway use to park use, of 2.9 acres.

Section 4.4.8 includes information regarding the reduction of impervious area. **Exhibit 4.4.12-5** in **Appendix B1** illustrates the existing pavement/hardscape areas within the parkland at approximately 15.1 acres. The total proposed pavement/hardscape area would be approximately 13.1 acres. This would be a net decrease in pavement/hardscape area of 2.0 acres, or 13% less hardscape area within the parkland area. With the removal of hardscape area, the amount of greenspace in the parkland would therefore be increased. This would also help to lower the amount of pollutants entering into Hoyt Lake, Mirror Lake and Scajaquada Creek (see **Section 4.8**).

Temporary easements covering approximately 14.2 acres will be needed for the Build Alternative within parkland (see **Exhibit 5.4.2-1** in **Appendix B1**). These include those required for reconstruction of NYS Route 198 (including the removal of existing pavement), for reconstruction of some segments of the Jesse Kregal Pathway, and for construction of new shared-use paths and footpaths within Delaware Park that would follow the alignment of historic park pathways to the greatest extent practical (see **Sections 3.3.2** and **5.4.2**). Construction activities in the temporary easements within the existing parkland would occur for less than six months.

2. Appraisal of Fair Market Value

For a conversion to be approved, the parcel to be converted must be replaced with a substitute parcel. The replacement parcel must be of at least equal fair market value, and at least as equivalent in such aspects as recreational value and location.

Since the property being offered as a replacement is already within or immediately adjacent to the parkland, it would have equivalent fair market value. The replacement will be appraised in compliance with the provision for conversion.

3. Reasonably Equivalent Usefulness and Location

The proposed replacement property would serve the same users that have used the property to be converted. The replacement property would be accessible to the public in the same way that the conversion property is accessible, and in many locations where additional paths and crossings are to be located, the replacement property would be more accessible. The Build Alternative would not only offer replacement property that is a viable recreation entity, but it would enhance the viability of recreation of the surrounding parkland in providing additional adjacent green space and by increasing recreational connectivity of the various parts of the parkland on either side of NYS Route 198.

4. Replacement Parcel Meets Eligibility Requirements for Acquisition

In order to approve a conversion, NPS must find that the property proposed as a replacement property would itself meet the eligibility requirements for LWCF-assisted acquisition (36 CR Section 59.3(b)(4)). According to the NPS LWCF *Federal Financial Assistance Manual*, the property would have to be accessible to the public and must constitute or be part of a viable recreation area.

The replacement property would become part of Delaware Park or the Olmsted Parks and Parkways Local Preservation District (see **Exhibit 4.4.12-4** in **Appendix B1**), which are viable recreation areas that are currently adjacent to the replacement property. The replacement property would be even more accessible to the public than the current recreation areas. The new parkland would be available once construction is complete in each area. Construction is proposed to be accomplished in three stages under two contracts (see **Section 3.3.1.7(5)**). Following construction of each stage, the replacement area for that stage would be available for recreation. Stage 1 (from Delaware Avenue to Parkside Avenue) and Stage 2 (Elmwood Avenue Section) would be constructed in the first contract. At the end of Stage 1, areas that are no longer needed for transportation purposes would be converted for use as parkland. Stage 3 (Grant Street Section) would be constructed in the second contract. The remaining area in transportation use that would be converted to recreation use would be available at the end of this stage. The final schedule for the second contract would be dependent upon funding. It is anticipated that right-of-way would be acquired in stages to match construction.

5. Remaining Park Area Must Remain Viable

For parks where only a portion of the Section 6(f) property is proposed to be converted, the impact of the conversion on the remaining area must also be considered and the unconverted area must remain viable or be replaced as well (36 CFR Section 59.3(b)(5)). While *2.7* of the 350 acres of existing parkland would be converted (0.8%) due to shifts in the existing highway alignment and improved pedestrian accommodations, the project would include an overall net increase in parkland areas (2.9 acres). The conversion would not affect the access or activities available in the remaining parkland. In fact, as discussed above, the remaining parkland would be enhanced by the Build Alternative.

6. Coordination with Federal Agencies

Section 4.1.2 provides a discussion of coordination with federal and state agencies. Regarding Section 6(f), NYSDOT has been coordinating with the NYS OPRHP as the liaison with the NPS. A meeting was held on March 14, 2016 with FHWA, NPS, NYS OPRHP and NYSDOT to review this project.

7. Guidelines for Environmental Evaluation

The decision by NPS to approve a conversion is an action subject to compliance with the provisions of NEPA. The NPS is a Cooperating Agency in the NEPA EIS process (see **Section 4.1**). It is anticipated that the NPS will accept this NEPA process and documentation to satisfy this requirement.

8. State Intergovernmental Clearinghouse Review Procedures

The proposed conversion and replacement parkland for the Build Alternative do not constitute a substantial change to the LWCF projects in Delaware Park or the Olmsted Parks and Parkways Local Preservation District. Therefore, this criterion does not apply.

9. Consistency with Statewide Comprehensive Outdoor Recreation Plan and/or equivalent recreational plans

The NPS also evaluates the replacement property in relation to the Statewide Comprehensive Outdoor Recreation Plan (SCORP). The current SCORP is the "Statewide Comprehensive Outdoor Recreation Plan and Generic Environmental Impact Statement 2014-2019," completed on March 26, 2014. The document serves as a "status report and as an overall guidance document for recreational resource preservation, planning, and development of the State's resources through 2019."[22] The SCORP states a vision for recreation in New York State as "to provide a system of safe and enjoyable recreational and interpretive opportunities for all New York State residents and visitors and to protect and improve the quality of the valuable natural, historic and cultural resources."[23] To meet this vision, the SCORP provides programmatic goals, including:

- Increase and deepen the visitor experience by reinventing and redesigning our parks and historic sites.
- Build a 21st century green and sustainable park system: fix and green the aging infrastructure of our parks and historic sites and open new facilities.
- Reconnect children and adults with nature and recreation by improving access to outdoor recreation opportunities.
- Continue to develop a comprehensive, interconnected recreation-way, water trails, greenway and blueway trail system.

As stated above, there would be a net decrease in pavement/hardscape area of 2.0 acres, or 13% less hardscape area within the parkland area (**Exhibit 4.4.12-5** in **Appendix B1**). With the removal of hardscape area, the amount of greenspace in the parkland would therefore be increased. The Build Alternative would also provide additional connectivity within the parklands and to the adjacent neighborhoods. This would also enhance the existing parkland. These aspects of the project are consistent with these goals and the overall vision of the SCORP.

In summary, as described above, the NYSDOT, FHWA, NYS OPRHP and NPS have determined and agreed on the parkland boundaries subject to Section 6(f) and the boundaries of the existing right-of-way being used for transportation. The Build Alternative includes shared-use paths and crossings that would enhance and improve the use of the existing parkland. The Build Alternative would be consistent with the BOPC's plan for the parkland and would reduce the hardscape while increasing the greenspace in the parkland. A total of 2.7 acres of parkland would be converted from parkland use and 5.6 acres of land currently used for transportation would replace the converted parkland. The Build Alternative would meet the nine criteria required for parkland conversion under the LWCF Act and applicable federal Department of the Interior regulations (36 CFR Part 59). The NYSDOT will continue to coordinate with NYS OPRHP and NPS during final design, as appropriate, regarding impacts to Delaware Park and design features to further minimize impacts.

[22] NYS OPRHP, p. 3

[23] Ibid., p. 33

4.4.13 Visual Resources

EXISTING CONDITIONS

A Visual Impact Assessment (VIA) was performed for this project. The purpose of the VIA was to evaluate the project and to assess its impacts, both positive and negative, on the visual resources of the project area. The full VIA and its methodology, analysis, and assessment of the Build Alternative can be found in **Appendix B7**.

The project area is located within the Erie-Ontario lake plain physiographic province. The local landscape consists of a nearly level post-glacial lake plain marked by stream action (Scajaquada Creek) and the limestone Onondaga Escarpment. Elevations above mean sea level in the project area range from 600 to 630 feet.

A site investigation was performed along the NYS Route 198 corridor to assess the physical and visual value of the existing roadside environment. The Scajaquada Expressway corridor traverses a diverse landscape that ultimately links the Black Rock Canal waterfront (adjacent to I-190) to NYS Route 33 in northeast Buffalo.

Four landscape districts with distinct visual experiences were identified within the project limits along with their visual character and visually sensitive resources. The four landscape districts are:

Landscape District A – Scajaquada Creek Overpass to Grant Street
Landscape District B – Grant Street to Elmwood Avenue
Landscape District C – Elmwood Avenue Parkside Avenue
Landscape District D – Parkside Avenue to Main Street

Identification of these districts provides a framework for visual assessment that allows an analysis of the Build Alternative and its effect on the existing environment. Major viewer groups within the corridor were also identified along with their exposure level and sensitivity to change.

Eight key viewpoints were selected within the corridor that are representative of the views that are most likely to be affected by the Build Alternative. These viewpoints were photographed and post-improvement photo simulations were developed to illustrate the potential changes to area visual resources that would result from a constructed project. These photographs and photo simulations are included in **Appendix B7**.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The Build Alternative would, to varying degrees, alter the visual character of the project area. These changes would largely be positive given the reduction of pavement areas; narrowed shoulders; elimination of land-consuming ramps; elimination of overhead highway sign structures; overall elimination of many high-speed expressway infrastructure elements; and introduction of a curbed landscaped (where possible) center median and ornamental lighting throughout the length of the project area.

4.4.14 Farmlands

4.4.14.1 State Farmland and Agricultural Districts

A review of the NYS Agricultural District Maps for Erie County confirmed that the project is not located in or adjacent to an Agricultural District as defined under Article 25-AA of the New York State Agricultural and Markets Law.

4.4.14.2 Federal Prime and Unique Farmland

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) guidelines set forth in the Federal Farmland Protection Policy Act (7 CFR Part 658) requires federal agencies to consider the adverse effects their programs may have on the preservation of farmland, review alternatives that could lessen adverse effects and ensure that their programs are compatible with private, local, and state programs and policies to protect farmland. Federal farmlands are classified as prime, unique, of statewide importance or of local importance based on soil types.

Prime Farmlands have the best combination of physical and chemical characteristics for producing food, feed forage, fiber, and other agricultural crops and are available for these uses. The NRCS "Web Soil Survey" shows the following soil types in the project area that are rated as being "prime farmland:"

- Cayuga silt loam, 3 to 8 percent slopes (CfB)
- Schoharie silt loam, 0 to 3 percent slopes (SaA)
- Schoharie silt loam, 3 to 8 percent slopes (SaB)
- Wassaic silt loam, 0 to 3 percent slopes (WaA)
- Wassaic silt loam, 3 to 8 percent slopes (WaB)

These soil types are all located in the portion of the corridor that passes through Delaware Park. These lands have already been converted from agricultural use. They are dedicated as an urban park and there is no potential for these lands to return to agricultural use (see **Section 4.4.12**). As defined in 7 CFR 658.2, ''farmland'' does not include land already in or committed to urban development. Therefore, the project would have no effect on farmland under the Federal Farmland Protection Policy Act.

4.4.15 Air Quality

An air quality analysis was conducted for the project, consisting of the following:

1) A mesoscale emission analysis, including: criteria pollutants (ozone precursors of volatile organic compounds [VOC] and nitrogen oxides [NOx], carbon monoxide [CO], and particulate matter smaller than or equal to 10 microns [PM_{10}] and 2.5 microns [$PM_{2.5}$] in size), mobile source air toxics (MSATs), greenhouse gases (GHGs) and energy;

2) A CO microscale analysis screening; and

3) A microscale PM_{10} and $PM_{2.5}$ analysis.

The air quality analyses were performed in accordance with methodologies presented in NYSDOT's *Environmental Manual* (TEM), updated in December 2012. The analyses were conducted using the most recent version of the MOVES emission factor model, which is currently MOVES2014a, USEPA guidance "*Using MOVES in Project-Level Carbon Monoxide Analyses*[24]" and "*Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*[25]" and the FHWA "*Interim Guidance Update on Mobile Source Air Toxic (MSAT) Analysis in NEPA Documents*[26]."

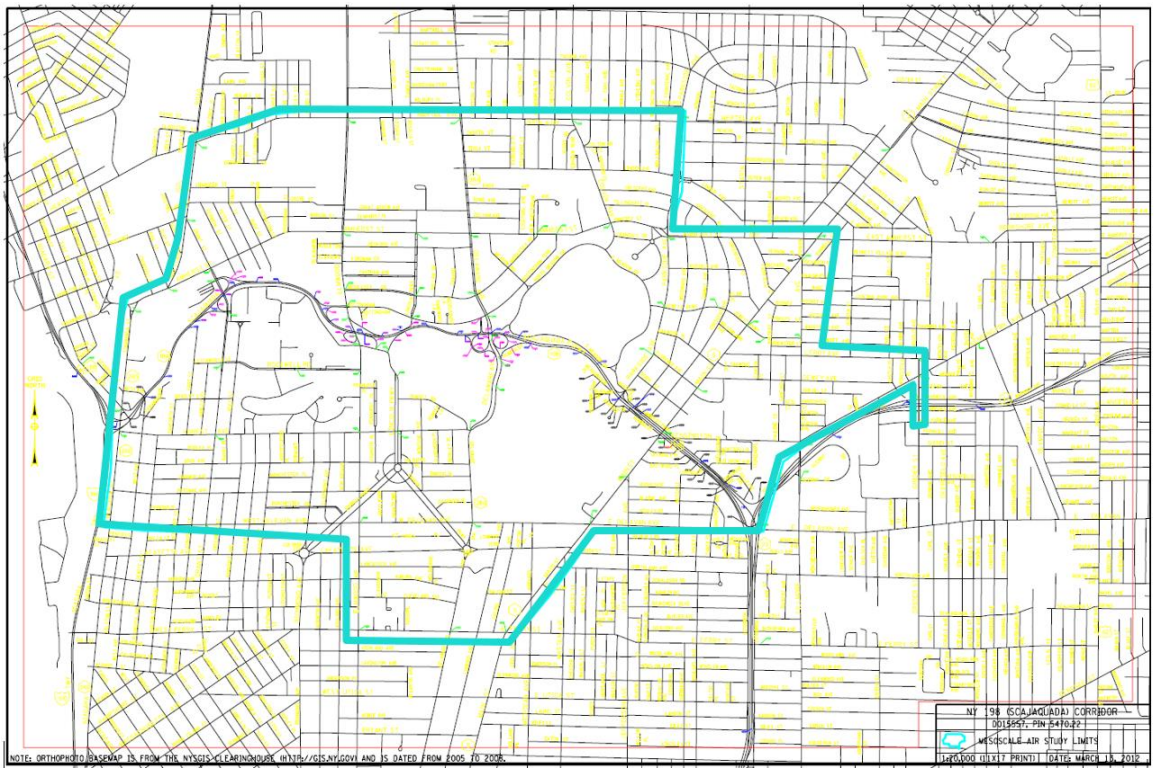
The air quality study area for this project is the same as that used for the traffic analysis. This study area is shown within the turquoise polygon on **Exhibit 4.4.15-1**.

[24]USEPA 2015, https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P100M2FB.pdf

[25]USEPA 2015, https://www.epa.gov/state-and-local-transportation/project-level-conformity-and-hot-spot-analyses

[26]FHWA, 2012, https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm

Exhibit 4.4.15-1 – Air Quality Study Area



The air quality analyses were conducted for the No-Build and Build Alternatives. In addition, for the purposes of evaluating cumulative effects, the conditions prior to the speed limit change from 50 mph to 30 mph, which was implemented independent of this project, was also evaluated.

The results of the mesoscale analysis indicate that, in all analysis years (Estimated Time of Completion [ETC], ETC+10, and ETC+20), emission burdens of VOCs are slightly higher (by 0.1%) under the Build Alternative, when compared to that under the No-Build. Emission burdens of NOx, CO, PM_{10} and $PM_{2.5}$ are slightly lower (by -0.1% to -2.2%) under the Build Alternative, when compared to that under the No-Build.

In all analysis years, MSATs are slightly lower (by -1.7% to -5.7%) under the Build Alternative, when compared to that under the No-Build. In all analysis years, on-road (direct) GHGs in terms of CO_2 Equivalent (CO2e) and on-road (direct) energy are slightly lower (by -0.4% to -1.3%) under the Build Alternative, when compared to that under the No-Build. For all criteria pollutants, MSATs, CO2e and energy, the highest burdens are in the ETC (2020), and the lowest are in ETC+20 (2040).

The results of the CO screening show that none of the intersections in the project area meet the criteria that would warrant a CO microscale analysis.

The results of the PM analysis show that no exceedances of the $PM_{2.5}$ or PM_{10} National Ambient Air Quality Standards (NAAQS) are estimated at any of the modeling receptor points under any of the scenarios analyzed.

4.4.15.1 Background Air Quality

In accordance with the Clean Air Act Amendments (CAAA), the USEPA has designated NAAQS for six criteria air pollutants: sulfur dioxide (SO_2), particulate matter (PM_{10}, $PM_{2.5}$), CO, ozone (O_3), nitrogen dioxide (NO_2), and lead.

As part of its statewide ambient air monitoring system, NYSDEC operates monitoring stations that measure ambient air concentrations of these pollutants in Erie County (including Amherst and Buffalo). NYSDEC prepares an annual monitoring plan that describes the rationale for the placement of sampling sites and selection of pollutants for ambient monitoring and changes that are made to the monitoring network. Pollutants for which local monitoring stations have a long history of demonstrating compliance with the NAAQS may be removed from the monitoring network plan. For new NAAQS, the monitoring network is adjusted to provide measurements for comparison to new standards. For example, monitoring for lead was discontinued at the end of 2004 and monitoring for PM_{10} is no longer performed in Western New York (NYSDEC Region 9), as long-term data have demonstrated compliance with the NAAQS. In addition to the annual network plan, NYSDEC also produces a report of ambient monitoring data. Monitored data from USEPA and NYSDEC in the Buffalo area is presented in **Exhibit 4.4.15-2**.

Exhibit 4.4.15-2
Criteria Air Pollutant Summary

Pollutant	Air Monitoring Station	Averaging Time	Monitored Concentration (1)	NAAQS
Sulfur Dioxide	185 Dingens St. Buffalo, NY	Primary 1-Hour	11.9 ppb	75 ppb
		Secondary 3-Hour	0.5 ppb	500 ppb (2)
Inhalable Particulates (PM_{10})	10th & Marne Erie, PA (3)	Primary and Secondary 24-Hour	34 µg/m^3	150 µg/m^3 (4)
Fine Inhalable Particulates ($PM_{2.5}$)	185 Dingens St. Buffalo, NY	Primary Annual	8.5 µg/m^3	12 µg/m^3 (5)
		24-Hour 98th Percentile	18.7 µg/m^3	35 µg/m^3 (6)
Carbon Monoxide	185 Dingens St. Buffalo, NY	8-Hour	1.7 ppm	35 ppm (2)
		1-Hour	2.1 ppm	9 ppm (2)
Ozone	Audubon Golf Course Amherst, NY	8-Hour	0.068 ppm	0.070 ppm (7)
Nitrogen Dioxide	185 Dingens St. Buffalo, NY	1-Hour	52 ppb	100 ppb (8)
		Annual	11.1 ppb	53 ppb
Lead	None in Region 9	Rolling 3-Month Average	No monitoring sites in Region 9	0.15 µg/m^3

Sources: EPA AirData, https://www.epa.gov/outdoor-air-quality-data; NYSDEC, http://www.dec.ny.gov/chemical/8536.html
ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter

(1) Monitored concentration shown is value for calendar year 2015. For some pollutants (NO_2 1-hour, ozone 8-hour, $PM_{2.5}$ and SO_2 1-hour) additional years are included to calculate 3-year average to determine NAAQS compliance.

(2) Not to be exceeded more than once per year.

(3) No PM_{10} monitors in NYSDEC Region 9; Erie, PA data used.

(4) Not to be exceeded more than once per year on average over 3 years.

(5) Average of last three years annual means not to exceed standard.

(6) Standard is compared to average of 98th percentile for last 3 years.

(7) Standard is compared to 4th highest daily 8-hour average concentration measured during the last 3 years.

(8) 98th percentile averaged over 3 years.

4.4.15.2 Climate Change and Greenhouse Gases

Climate change is a national and global concern. While the earth has gone through many natural climate variations in its history, there is general agreement that the earth's climate is currently changing at an accelerated rate and will continue to do so for the foreseeable future. Anthropogenic (human-caused) GHG emissions contribute to this rapid change. Carbon dioxide (CO_2) makes up the largest component of these GHG emissions. Other prominent transportation GHGs include methane (CH_4) and nitrous oxide (N_2O).

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different GHGs. Specifically, it is a measure of how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide (CO2). The larger the GWP, the more that a given gas warms the earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policymakers to compare emissions reduction opportunities across sectors and gases. CO_2, by definition, has a GWP of 1; Methane (CH_4) has a GWP of 25; and Nitrous Oxide (N_2O) has a GWP of 298. GHGs are reported in CO_2 Equivalents (CO2e), which is a combined measure of greenhouse gas emissions weighted according to the global warming potential of each gas, relative to CO_2.

To date, USEPA has not established a NAAQS for CO2 under the Clean Air Act. However, the Council on Environmental Quality (CEQ) has released final guidance for Federal agencies on how to consider the impacts of their actions on global climate change in their NEPA reviews. In this guidance, CEQ advises

agencies to quantify projected GHGs of proposed Federal actions in Environmental Assessments and Environmental Impact Statements whenever the necessary tools, methodologies, and data inputs are available.

4.4.15.3 Air Quality Methodology Summary

The air quality analysis considers the ETC year, the year of ETC+10, and the year of ETC+20. An emission analysis of these three years is performed to determine the "critical year," that is, the year in which the highest emissions occur. For this project, the ETC year is 2020, ETC+10 is 2030 and ETC+10 is 2040.

MOTOR VEHICLE EMISSION SIMULATOR (MOVES) MODEL – VERSION 2014A

USEPA's emission factor algorithm, MOVES2014a, was used to estimate the mobile source emission factors for the analyses. MOVES2014a captures the influence of time of day, car and bus/truck activity, and seasonal weather effects on emission rates from vehicles. MOVES2014a calculates emission-related parameters, such as total mass emissions and vehicle activity (hours operated and miles travelled). From this output, emission rates (e.g., grams/vehicle-mile for moving vehicles or grams/vehicle-hour for idling vehicles) can be determined for a wide variety of spatial and time scales.

MOVES2014a requires the use of site-specific input data for traffic volumes, vehicle types, fuel parameters, age distribution, and other input, as discussed below. By using site-specific data, the emission results reflect the site-specific traffic characteristics of the affected roadways.

MOVES2014a was used to develop the emission factors for both the mesoscale and microscale analyses. Project-specific and Erie County-specific data were imported into MOVES2014a; these data consisted of fuel supply and fuel formulation (gasoline and diesel), the vehicle inspection and maintenance program applicable to the area, meteorology, vehicle-age distribution, and alternative fuel vehicle technology availability.

For project-specific vehicle data input, a detailed road-link source network was used in MOVES2014a to capture vehicle volumes (i.e., vehicles per hour/time period), vehicle types (cars, buses/trucks, etc.), speed, and link type (free-flowing or idle) on the affected roadways. Project-specific vehicle volumes (vehicles per hour) and speeds were input for each road-link source based on traffic data as discussed in the Air Quality Technical Report[27].

In addition to tail-pipe emissions, vehicle-related emissions of dust (PM_{10} and $PM_{2.5}$) generated by vehicles traveling on paved and/or unpaved roadways were considered for inclusion in this analysis. Road dust emissions of $PM_{2.5}$ are not considered to be a substantial contributor to $PM_{2.5}$ levels in the area. Road dust emissions are considered to be a substantial contributor to PM_{10} levels in the study area, however, and were included in the PM_{10} analysis; this is consistent with recommendations in USEPA guidance.

MESOSCALE ANALYSIS

A mesoscale air quality analysis was conducted of the roadways in the study area, including affected arterial roads. The analysis was conducted using MOVES2014a for years 2020, 2030 and 2040. Emission burdens for CO, VOCs, NOx, PM_{10} and $PM_{2.5}$ and MSATs were calculated based on link by link traffic data. On-road energy consumption and greenhouse gas emissions were also calculated with the emission model.

[27] WSP | Parsons Brinckerhoff. *Air Quality Technical Report, NYS Route 198 (Scajaquada Expressway) Corridor*. September 2016.

CO MICROSCALE ANALYSIS SCREENING

Following the guidance in the NYSDOT TEM, a CO microscale analysis screening was conducted at the intersections impacted by the project. Thirty-nine (39) intersections were evaluated in the traffic analysis and all these intersections underwent screening. Intersections that demonstrate a Level of Service (LOS) of C or better under the Build Alternative do not warrant a CO microscale analysis. Of the 39 intersections evaluated, seven failed the initial screening, as they have a LOS of D or below under the Build Alternative.

These seven intersections were then screened according to the volume threshold screening in the NYSDOT TEM. The results of this screening are provided in **Section 6.2.1 of Appendix B8 Air Quality Technical Report.**

PM MICROSCALE ANALYSIS

To address concerns expressed from the public regarding particulate matter air quality in the study area, a $PM_{2.5}$ and PM_{10} microscale air quality analysis was conducted for the project. The analysis followed USEPA's *Transportation Conformity Guidance for Quantitative Hot-spot Analysis in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*. Based on the mesoscale emission analysis for years 2020, 2030, and 2040, it was determined that year 2020 is the critical analysis year (year with the expected highest emissions). Hence, the $PM_{2.5}$ and PM_{10} microscale air quality analysis was performed for year 2020.

$PM_{2.5}$ emissions account for tailpipe, tire wear, and brake wear emissions and PM_{10} emissions account for tailpipe, tire wear, brake wear and re-entrained dust emissions. On-road vehicle emissions were estimated using MOVES2014a. The $PM_{2.5}$/PM_{10} emissions vary by time of day and time of year. Volume and speed data for each source were obtained from the traffic analysis as detailed in the Air Quality Technical Report, for the AM peak, Midday, PM peak and overnight, using quarterly climate conditions. For every source, a total of 16 emission factors in units of grams per mile were developed for the four time periods and four seasons.

The USEPA AERMOD dispersion model was used to determine $PM_{2.5}$ and PM_{10} estimated levels. Five years of meteorological data were input into the AERMOD program to calculate the annual and 24-hour PM levels at the receptors analyzed. Five years of upper air and surface meteorological data were obtained from Buffalo Niagara International (BUF) Airport in Buffalo, NY.

Receptors were placed in a grid pattern around the study area sources according to criteria in the NYSDOT TEM and USEPA guidance.

Microscale modeling is used to predict concentrations resulting from emissions from motor vehicles using roadways immediately adjacent to the locations at which predictions are being made. A background level must be added to this value to account for pollution entering the area from other sources. The background level is the component of the total concentration not accounted for through the microscale modeling analysis. Refer to **Section 5.6 of Appendix B8 Air Quality Technical Report** for further details on the development of background levels using USEPA's design values and the past three years of monitored data.

4.4.15.4 Air Quality Analysis Results

MESOSCALE ANALYSIS

Exhibit 4.4.15-3 presents the vehicle miles traveled (VMT) and emission burdens of VOC, NOx, CO, PM_{10} and $PM_{2.5}$ under the No-Build and Build Alternatives. As shown in the table, in all analysis years, the VMT is slightly higher (by 1.2%) under the Build Alternative, when compared to that under the No-Build. The emission burdens of VOCs are slightly higher (by 0.1%) under the Build Alternative, when compared

to that under the No-Build. Emission burdens of all other pollutants are slightly lower (by -0.1% to -2.2%) under the Build Alternative, when compared to that under the No-Build. These lower emissions, when considering the higher VMT under the Build Alternative, are mainly due to emission characteristics of these pollutants versus vehicle speeds in the MOVES emissions model.

Exhibit 4.4.15-4 presents the emission burdens of MSATs under the No-Build and Build Alternatives. As shown in the table, in all analysis years, MSATs are lower (by -1.7% to -5.7%) under the Build Alternative, when compared to that under the No-Build. These lower emissions of MSATs, when considering the higher VMT under the Build Alternative, are mainly due to the emission characteristics of MSATs versus vehicle speeds in the MOVES emission model.

Exhibit 4.4.15-5 presents the on-road (direct) emission burdens of GHGs in terms of CO_2e, as well as differences in energy consumption, under the No-Build and Build Alternatives. As shown in the table, in all analysis years, both on-road (direct) CO_2e and energy are lower (by -0.4% to -1.3%) under the Build Alternative, when compared to that under the No-Build. These lower values of CO_2e and energy use, when considering the higher VMT under the Build Alternative, are mainly due to the emission characteristics of CO_2e and energy versus vehicle speeds in the MOVES emission model.

For all criteria pollutants, MSATs, CO_2e and energy, the highest burdens are in the year 2020 and the lowest are in the year 2040.

Exhibit 4.4.15-3
Mesoscale Emission Burdens (tons/year)

Pollutant	2020			2030			2040		
	No-Build	Build	% Difference	No-Build	Build	% Difference	No-Build	Build	% Difference
VMT (miles/year)	*43,334,342*	*43,863,753*	*1.2%*	*44,244,215*	*44,783,496*	*1.2%*	*45,166,927*	*45,708,878*	*1.2%*
VOC	78.85	78.93	0.1%	52.18	52.21	0.1%	39.93	39.95	0.1%
NOx	303.62	303.06	-0.2%	282.29	282.00	-0.1%	255.67	255.54	-0.1%
CO	290.38	284.78	-1.9%	210.34	206.95	-1.6%	182.74	179.94	-1.5%
PM_{10}	7.45	7.44	-0.1%	5.50	5.46	-0.8%	3.73	3.65	-2.2%
$PM_{2.5}$	4.59	4.55	-1.0%	2.72	2.69	-1.0%	1.00	0.98	-2.0%

Exhibit 4.4.15-4
Mobile Source Air Toxics (MSATs) Emission Burdens (tons/year)

Pollutant	2020			2030			2040		
	No-Build	Build	% Difference	No-Build	Build	% Difference	No-Build	Build	% Difference
VMT (miles/year)	*43,334,342*	*43,863,753*	*1.2%*	*44,244,215*	*44,783,496*	*1.2%*	*45,166,927*	*45,708,878*	*1.2%*
Acrolein	0.00735	0.00720	-2.0%	0.00405	0.00387	-4.4%	0.00206	0.00200	-2.7%
Benzene	0.06987	0.06815	-2.5%	0.03314	0.03184	-3.9%	0.02415	0.02316	-4.1%
1,3 Butadiene	0.00584	0.00574	-1.7%	0.00134	0.00126	-5.7%	0.00014	0.00013	-2.4%
Diesel PM	0.55498	0.53408	-3.8%	0.19281	0.18590	-3.6%	0.07899	0.07743	-2.0%
Formaldehyde	0.11391	0.11186	-1.8%	0.06919	0.06680	-3.5%	0.04605	0.04481	-2.7%
Naphthalene	0.01208	0.01184	-1.9%	0.00661	0.00634	-4.1%	0.00375	0.00364	-2.9%

*Emissions of polycyclic organic matter (POM) cannot be accurately calculated by MOVES2014a but would show a similar trend as emissions of acrolein

Exhibit 4.4.15-5
On-Road Energy and GHG Burdens

Pollutant	2020			2030			2040		
	No-Build	Build	% Difference	No-Build	Build	% Difference	No-Build	Build	% Difference
VMT (miles/year)	*43,334,342*	*43,863,753*	*1.2%*	*44,244,215*	*44,783,496*	*1.2%*	*45,166,927*	*45,708,878*	*1.2%*
CO_2e (tons/year)	34,664	34,535	-0.4%	29,322	29,085	-0.8%	27,993	27,655	-1.2%
Energy (MBTU/year)	399,334	397,782	-0.4%	334,747	331,922	-0.8%	317,708	313,691	-1.3%

MBTU = Million British Thermal Units

MICROSCALE ANALYSIS

Carbon Monoxide

As previously stated, seven of the intersections in the study area have a LOS of D or worse under the Build Alternative; therefore, a volume threshold screening was conducted as specified in the NYSDOT TEM.

When applying the emission factors that were generated for this screening, it was determined that intersections in the study area with approach volumes of less than 4,000 at any approach would not warrant a CO microscale analysis.

All of the seven intersections have volumes that are below 4,000. As such, none of the intersections in the study area meet the criteria that would warrant a CO microscale analysis.

Particulate Matter

The $PM_{2.5}$ and PM_{10} maximum concentrations (including background) for year 2020 are summarized in **Exhibit 4.4.15-6, Exhibit 4.4.15-7**, and **Exhibit 4.4.15-8**. The result of this analysis is that no exceedances of the NAAQS were predicted under either alternative. As shown in the tables, concentrations of $PM_{2.5}$ and PM_{10} are lower under the Build Alternative, as compared to the No-Build Alternative. Contour maps of the results are presented in **Appendix B8 Air Quality Technical Report**.

Exhibit 4.4.15-6
Predicted 24-hour PM10 Maximum Concentrations – 2020

Alternative	Background Concentration (ug/m^3)	Modeled Concentration (ug/m^3)	Total Concentration* (ug/m^3)
No-Build	37	17.2	54.2
Build		15.9	52.9

Notes: *Total concentrations = modeled results + 24-hour PM_{10} background
24-hour PM_{10} standard = 150 ug/m^3
Abbreviation: ug/m^3 = micrograms per cubic meter

Exhibit 4.4.15-7
Predicted 24-hour PM2.5 Maximum Concentrations – 2020

Alternative	Background Concentration (ug/m^3)	Modeled Concentration (ug/m^3)	Total Concentration* (ug/m^3)
No-Build	21	1.0	22.0
Build		0.8	21.8

Notes: *Total concentrations = modeled results + 24-hour $PM_{2.5}$ background
24-hour $PM_{2.5}$ standard = 35 ug/m^3
Abbreviation: ug/m^3 = micrograms per cubic meter

Exhibit 4.4.15-8
Predicted Annual PM2.5 Maximum Concentrations – 2020

Alternative	Background Concentration (ug/m^3)	Modeled Concentration (ug/m^3)	Total Concentration* (ug/m^3)
No-Build	8.6	0.3	8.9
Build		0.2	8.8

Notes: *Total concentrations = modeled results + Annual $PM_{2.5}$ background
Annual $PM_{2.5}$ standard = 12 ug/m^3
Abbreviation: ug/m^3 = micrograms per cubic meter

50 MPH CONDITIONS WITHOUT PROJECT

The 50 mph conditions without the project were evaluated to address cumulative effects. Cumulative effects result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions.

The 50 mph conditions reflect data that were collected before the speed limit was changed to 30 mph, lanes were narrowed, and stop signs were installed on ramp approaches. These changes resulted in an approximate diversion of 20% of the traffic volume from the 50 mph conditions (refer to **Section 3.3.1.6**).

As shown in **Exhibit 4.4.15-9,** VMT for the 50 mph conditions is approximately 20% higher in the project study area than that for the No-Build and Build Alternatives. This table also presents the emission burdens of the 50 mph conditions in ETC (2020), ETC+10 (2030) and ETC+20 (2040).

Exhibit 4.4.15-9
Mesoscale Emission Burdens - 50 mph Conditions without Project (tons/year)

Pollutant	2020	2030	2040
VMT (miles/year)	*54,186,289*	*55,278,368*	*56,361,650*
VOC	82.15	54.33	41.62
NOx	309.23	285.07	257.48
CO	335.82	236.98	203.92
PM_{10}	8.08	6.11	4.30
$PM_{2.5}$	4.86	2.88	1.11

Exhibit 4.4.15-10 presents the MSAT emission burdens under the 50 mph conditions without the project, and **Exhibit 4.4.15-11** presents the on-road (direct) CO2e and energy consumption. For all criteria pollutants, MSATs, CO2e and energy, the highest burdens are in year 2020, and the lowest are in year 2040.

Exhibit 4.4.15-10
Mobile Source Air Toxic (MSAT) Emission Burdens – 50 mph Conditions without Project (tons/year)

Pollutant	2020	2030	2040
VMT (miles/year)	*54,186,289*	*55,278,368*	*56,361,650*
Acrolein	0.00879	0.00489	0.00248
Benzene	0.08597	0.04123	0.02983
1,3 Butadiene	0.00704	0.00163	0.00016
Diesel PM	0.65903	0.23277	0.09556
Formaldehyde	0.13642	0.08365	0.05543
Naphthalene	0.01450	0.00801	0.00453

*Emissions of POM cannot be accurately calculated by MOVES2014a but would show a similar trend as emissions of acrolein

Exhibit 4.4.15-11
On-Road Energy and GHG Burdens - 50 mph Conditions without Project

Pollutant	2020	2030	2040
VMT (miles/year)	54,186,289	55,278,368	56,361,650
CO_2e (tons/year)	39,647	33,411	31,867
Energy (MBTU/year)	458,191	382,994	363,392

MBTU = Million British Thermal Units

Exhibit 4.4.15-12, **Exhibit 4.4.15-13**, and **Exhibit 4.4.15-14** present the results of the PM microscale analysis for the 50 mph conditions without the project in the year 2020. Contour maps of the results are presented in **Appendix B8 Air Quality Technical Report**. **Section 4.7.9** discusses cumulative effects.

Exhibit 4.4.15-12 Predicted 24-hour PM10 Maximum Concentrations, 50 mph Conditions without Project–2020		
Background Concentration (ug/m^3)	**Modeled Concentration (ug/m^3)**	**Total Concentration* (ug/m^3)**
37	19.9	56.9

Notes: *Total concentrations = modeled results + 24-hour PM_{10} background
24-hour PM_{10} standard = 150 ug/m^3
Abbreviation: ug/m^3 = micrograms per cubic meter

Exhibit 4.4.15-13 Predicted 24-hour PM2.5 Maximum Concentrations, 50 mph Conditions without Project–2020		
Background Concentration (ug/m^3)	**Modeled Concentration (ug/m^3)**	**Total Concentration* (ug/m^3)**
21	1.0	22.0

Notes: *Total concentrations = modeled results + 24-hour $PM_{2.5}$ background
24-hour $PM_{2.5}$ standard = 35 ug/m^3
Abbreviation: ug/m^3 = micrograms per cubic meter

Exhibit 4.4.15-14 Predicted Annual PM2.5 Maximum Concentrations, 50 mph Conditions without Project–2020		
Background Concentration (ug/m^3)	**Modeled Concentration (ug/m^3)**	**Total Concentration* (ug/m^3)**
8.6	0.2	8.8

Notes: *Total concentrations = modeled results + Annual $PM_{2.5}$ background
Annual $PM_{2.5}$ standard = 12 ug/m^3
Abbreviation: ug/m^3 = micrograms per cubic meter

CONSTRUCTION

Air quality effects during construction would be limited to short-term increased fugitive dust and mobile source emissions. Any construction-related dust and emissions would cease once the project is completed. Measures would be included in the project contract documents to minimize local air quality effects during construction. Typical measures include the following:

- Use ultra-low sulfur diesel fuel in off-road construction equipment;
- Limit unnecessary idling times on diesel powered engines;
- Local diesel powered exhausts away from fresh air intakes; and
- Dust control measures per NYSDOT standard specifications.

To minimize the amount of emissions generated, maintenance and protection of traffic measures, as discussed in **Section 3.3.1.7(5)** would be implemented during the construction phase to limit disruption to traffic and ensure that adequate roadway capacity is available to general traffic during peak travel periods.

4.4.16 Energy

4.4.16.1 Introduction

FHWA 1987 guidelines[28] for preparing environmental impact statements recommend a comparison of direct and indirect energy consumption impacts due to a highway project. The State Energy Plan, adopted in 2002, calls for the State's transportation sector to be more energy efficient and sets goals for reducing consumption.

Since the Build Alternative would change travel patterns in the study area, it has the potential to affect energy consumption. Both the potential direct and indirect energy impacts of the project are analyzed based on guidance and procedures developed by NYSDOT for estimating the energy impacts from construction, maintenance and operation of transportation projects. Details of the energy analysis are included in **Appendix B9**.

4.4.16.2 Energy Analysis

An analysis of direct energy consumption[29] was conducted using the project input and output data from the MOVES2014a air quality analysis described in **Section 4.4.15**. The direct energy analysis indicated slightly lower direct energy consumption under the Build Alternative when compared to that under the No-Build Alternative.

Indirect energy is comprised of both energy from maintenance activities and energy from construction activities. For the purposes of this analysis, the energy from maintenance was assumed to be the same for both the Build and No-Build Alternatives and the No-Build Alternative was assumed to have no construction energy consumption.

The total energy consumed includes both direct and indirect energy. The results of the analysis show that the Build Alternative would have a slightly higher total energy consumption compared to the No-Build Alternative due to the indirect effects of the construction of the Build Alternative.

Exhibit 4.4.16-1
Total Estimated Energy Use (Direct and Indirect)

Alternative	Total Energy Consumption (million BTU) 2020	Total Energy Consumption (million BTU) 2030	Total Energy Consumption (million Btu) 2040
No-Build	402,229	337,642	320,603
Build	408,995	343,136	324,905
% Difference	2%	2%	1%

4.4.16.3 Greenhouse Gas Analysis

The majority of the greenhouse gas emissions associated with the project are in the form of carbon dioxide (CO_2), resulting from the combustion of carbon-based fossil fuels. Fossil fuels account for virtually all energy use by motor vehicles (direct energy), and for virtually all energy embedded in the construction materials and equipment used during construction and maintenance of the roadway (indirect energy). Thus, the analysis of potential emissions of greenhouse gases for this project used the results from the direct and indirect energy analyses and is reported as CO_2 Equivalent (CO_2e).

[28] FHWA Technical Advisory T 6640.8A, October 30, 1987: Guidance for Preparing and Processing Environmental and Section 4(f) Documents

[29] Direct energy is defined as the energy consumed by the vehicles using the facility.

The results of the analysis show a lower level of CO_2e emissions from direct energy consumption for the Build Alternative compared to that under the No-Build Alternative. However, when combined with the CO_2 emissions from the indirect energy consumption, the analysis shows that the Build Alternative would result in 1 to 2% higher emissions compared to that under the No-Build Alternative.

Exhibit 4.4.16-2
Total Annual CO2e Emissions Estimated

Alternative	CO_2e (Tons per Year)		
	2020	2030	2040
No-Build	34,987	29,555	28,226
Build	35,438	29,988	28,558
% Difference	2%	2%	1%

4.4.16.4 Mitigation Summary

The Build Alternative would improve operating efficiency of the project corridor, thereby reducing direct energy and greenhouse gas emissions. Due to the indirect energy used in the construction of the Build Alternative, the total energy consumed and greenhouse gases emitted would be 1 to 2% higher than those of the No-Build Alternative. During construction, mitigation measures that would minimize energy usage and GHG emissions may include, but not be limited to, the following

- Limit unnecessary idling times for all pieces of construction equipment;
- Reduce idling time of roadway traffic due to construction by maintaining and protecting traffic flow during construction:
- Promote the use electrically powered equipment over equipment powered by fossil fuels;
- Promote the use of new Tier 4 construction equipment;
- Promote the use of recycled material;
- Promote the re-use of construction materials.

4.4.17 Noise

The Scajaquada Corridor Project is classified as a Type I noise project under FHWA noise regulations (23 CFR 772). Thus, a traffic noise analysis was conducted for the project in accordance with FHWA noise regulations and the NYSDOT Noise Analysis Policy.

A review of local planning documents was performed in conjunction with a site visit to identify existing activities and developed lands, and to locate undeveloped lands for which development is planned, designed, or programmed. A total of 20 noise-sensitive receiver areas, as defined by 23 CFR 772, were identified and are described below and shown in **Appendix B10**.

- **Receiver Location A** -- Representative of Buffalo State College with dorms and active sports fields. Receiver located in the athletics area with exterior areas of frequent human use - Activity Category B and C (school, residential, and active sports area).
- **Receiver Location B** -- Representative of the western portion of the linear park with walking/bike trails, playgrounds, residential areas, a church, and a school. Receiver is located in a representative green space within the linear park. - Activity Categories B and C (residential, church, school, park, playground, active sports area, and recreation area).
- **Receiver Location C** -- Representative of McKinley High School and eastern portion of the linear park with walking/bike trails and playgrounds. Receiver is located in a representative green space within the linear park - Activity Category C (school, park, and recreation area).

- **Receiver Location D** -- Representative of Buffalo State College Campus House (with outdoor patio), nearby library, and academic areas. Receiver located in a grassy area representative of exterior use areas - Activity Category C (school and library).
- **Receiver Location E** -- Representative of a portion of the park with walking/bike trails, oriental garden, and the Buffalo History Museum green space. Receiver is located in a representative green space behind the Buffalo History Museum - Activity Category C (library, park, picnic area, and recreation area).
- **Receiver Location F** -- Representative of Albright-Knox Art Gallery, Rose Garden/park with walking/ bike trails/playgrounds, and Marcy Casino with associated recreation, green space, and picnic areas. Other outdoor special events are often held here as well. Receiver is located in a representative green space adjacent to the art gallery - Activity Category C (picnic area and recreation area).
- **Receiver Location G** -- Representative of park with walking/bike trails and western Hoyt Lake with associated recreation and green space. Receiver is located in a representative green space along the walking/bike trail - Activity Category C (park, picnic area, playgrounds, and recreation area).
- **Receiver Location H** -- Representative of a portion of Delaware Park with walking/bike trails and tennis courts with residential across Nottingham Terrace. Receiver is located in a representative green space within the park. - Activity Categories B and C (residential, park, active sports area, and recreation area).
- **Receiver Location I** -- Representative of park with walking/bike trails and eastern Hoyt Lake with associated recreation and green space. Receiver is located in a representative green space along the walking/bike trail - Activity Category C (park and recreation area).
- **Receiver Location J** -- Representative of a portion of Delaware Park with walking/bike trails, soccer, golf and tennis courts. Receiver is located in a representative green space within the park - Activity Category C (park, picnic area, active sports area, and recreation area).
- **Receiver Location K** -- Representative of a portion of Forest Lawn Cemetery with walking/bike trails in a park-like setting. Receiver is located in a representative green space within the cemetery - Activity Category C (cemetery and recreation area).
- **Receiver Location L** -- Representative of approximately 27 residential structures with frontage on the south side of NYS Route 198 west of Main Street, Buffalo Municipal Housing Authority (BMHA) housing, college dormitories, Canisius College, and Medaille College. Receiver is located at a representative property in the front yard. - Activity Categories B and C (residential and school).
- **Receiver Location M** -- Representative of approximately 18 residential structures with frontage on the north side of NYS Route 198 west of Main St. Receiver is located at a representative property in the front yard. - Activity Category B (residential area). Note that within the Receiver Location M area exists the Sisters of Charity Hospital Office Medical Facility. There are no exterior areas of frequent use areas associated with this facility, therefore, it is considered Activity Category D.
- **Receiver Location N** -- Representative of approximately 25 residential structures with frontage on the south side of NYS Route 198. Receiver is located at a representative property in the front yard - Activity Category B (residential area).
- **Receiver Location O** -- Representative of approximately 30 residential structures with frontage on the north side of NYS Route 198. Receiver is located at a representative property in the front yard - Activity Category B (residential area).
- **Outlying Receiver Locations P1- P5** – The following five receivers are located in areas where physical changes to NYS Route 198 are expected to influence the volumes along these outlying roadways.
- **Receiver Location P1** -- Representative of residential homes in the area of the Austin Street, Military Road, and the Grant Street Intersection - Activity Category B (residential area).
- **Receiver Location P2** -- Representative of Nichols School on Amherst Street between Nottingham Terrace and Colvin Avenue - Activity Category C (school and active sports area).
- **Receiver Location P3** -- Representative of residential homes on Middlesex Road between Elmwood Avenue and Lincoln Parkway - Activity Category B (residential area).

- **Receiver Location P4** -- Representative of residential homes on Middlesex Rd. between Lincoln Parkway and Delaware Avenue - Activity Category B (residential area).
- **Receiver Location P5** -- Representative of residential homes on Forest Ave. between Lincoln Parkway and Elmwood Avenue - Activity Category B (residential area).

Field noise measurements were collected in December 2011 and February/March 2012 for all 20 receivers. Using a sound meter that meets ANSI Standards for Type 2 meters, existing noise levels were measured in accordance with the NYSDOT's manual, *Field Measurement of Existing Noise Levels*. Traffic volumes, speeds, vehicle classifications, weather conditions, area topography and particular incidents that may affect the measurement were recorded at each site concurrent with the noise measurements.

Computer modeling that reflects the field conditions (e.g., observed traffic, speeds, geometrics) was developed and includes all receiver sites. The FHWA Traffic Noise Model 2.5 (TNM) computer program was used for this modeling. Comparison between the results of the TNM modeling and the field measured noise levels indicated that the created computer models were valid and accurate to be used in the existing and future noise level predictions (in accordance with NYSDOT policy).

TNM noise modeling of the project area was performed for 2016 existing conditions and the project design year (2040). Computed noise levels are documented in the Noise Analysis Report (see **Appendix B10**). The following two criteria were used to determine if noise impacts would occur:

1) A 6 dBA or more increase between the existing noise levels and the predicted future traffic noise levels;

2) The predicted future traffic noise levels approach within 1 dB(A) or exceed the appropriate Noise Abatement Criteria (NAC) specified in FHWA noise regulations and NYSDOT Noise Policy. Activity Categories B and C have a NAC of 67 dBA, and Activity Category D has an NAC of 52 dB(A).

Existing predicted noise levels were compared to the predicted future 2040 noise levels to identify potential future noise impacts. The noise modeling results indicate that analysis sites G, H, L, M, N, and O have design year noise impacts at receivers based on computed noise levels that approach or exceed the NAC. Thus, additional modeling was performed at these analysis sites. Refer to the Noise Analysis Report (**Appendix B10**) for a full description of the impact assessment, and summary and detailed analysis tables are provided below.

Exhibit 4.4.17-1
Summary of Analysis Areas - Traffic Noise Levels (Leq)

Receiver			Noise Level (Leq)			
			Existing Conditions (dBA)	Design Year (2040)		
Receiver Location	FHWA Category	NAC (dBA)		No-Build Alternative (dBA)	Build Alternative (dBA)	Impact
Receiver A: Buffalo State College near athletics area & dorms. - Activity Categories B and C (school, residential, & active sports area).	B & C	67 (Exterior)	57	57	57	No
Receiver B: Multiple receiver area within western area of linear park. - Activity Categories B and C (residential, church, school, park, playground, active sports area, & recreation area).	B & C	67 (Exterior)	60	60	59	No
Receiver C: McKinley High School &	C	67	58	58	58	No

Exhibit 4.4.17-1
Summary of Analysis Areas - Traffic Noise Levels (Leq)

Receiver			Noise Level (Leq)			
			Existing Conditions (dBA)	Design Year (2040)		
Receiver Location	FHWA Category	NAC (dBA)		No-Build Alternative (dBA)	Build Alternative (dBA)	Impact
eastern linear park. - Activity Category C (school, park, & recreation area).		(Exterior)				
Receiver D: BSC Campus House, library, & academic areas. - Activity Category C (school & library).	C	67 (Exterior)	61	62	61	No
Receiver E: BECHS green space, park, & oriental garden. - Activity Category C (library, park, picnic area, & recreation area).	C	67 (Exterior)	61	61	60	No
Receiver F: Albright-Knox Art Gallery, Rose Garden/Park, & Marcy Casino. - Activity Category C (picnic area & recreation area).	C	67 (Exterior)	61	61	61	No
Receiver G: Delaware Park & western Hoyt Lake. - Activity Category C (park, picnic area, playgrounds, & recreation area).	C	67 (Exterior)	66	66	**66**	**Yes**
Receiver H: Delaware Park trails & athletic areas/Nottingham Terrace residential. - Activity Categories B and C (residential, park, active sports area, & recreation area).	B & C	67 (Exterior)	68	68	**68**	**Yes**
Receiver I: Delaware Park & eastern Hoyt Lake. - Activity Category C (park & recreation area).	C	67 (Exterior)	59	60	60	No
Receiver J: Delaware Park trails & sports areas. - Activity Category C (park, picnic area, active sports area, & recreation area).	C	67 (Exterior)	64	64	64	No
Receiver K: Forest Lawn Cemetery walking/bike trails/park-like setting. - Activity Category C (cemetery & recreation area).	C	67 (Exterior)	63	64	63	No
Receiver L: Residential structures south of Route 198, BMHA housing, college dormitories, Canisius College, Medaille College - Activity Category B (residential, school, & hospital).	B	67 (Exterior)	71	71	**71**	**Yes**
Receiver M: Residential structures north of Route 198 (see Exhibit 4.4.7-15 for NAC Activity Category D) - Activity Category B (residential area).	B	67 (Exterior)	67	67	**67**	**Yes**

Exhibit 4.4.17-1
Summary of Analysis Areas - Traffic Noise Levels (Leq)

Receiver			Noise Level (Leq)			
				Design Year (2040)		
Receiver Location	FHWA Category	NAC (dBA)	Existing Conditions (dBA)	No-Build Alternative (dBA)	Build Alternative (dBA)	Impact
Receiver N: Residential structures south of Route 198. - Activity Category B (residential area).	B	67 (Exterior)	70	70	**70**	**Yes**
Receiver O: Residential structures north of Route 198. - Activity Category B (residential area).	B	67 (Exterior)	67	67	**67**	**Yes**
Outlying Receiver P1: Residential near Austin Street, Military Road, & the Grant Street Intersection - Activity Category B (residential area).	B	67 (Exterior)	65	65	65	No
Outlying Receiver P2: Nichols School sports & academic areas. - Activity Category C (school & active sports area).	C	67 (Exterior)	60	60	60	No
Outlying Receiver P3: Residential on Middlesex Rd. between Elmwood Avenue & Lincoln Parkway. - Activity Category B (residential area).	B	67 (Exterior)	51	51	51	No
Outlying Receiver P4: Residential on Middlesex Rd. between Lincoln Parkway & Delaware Avenue. - Activity Category B (residential area).	B	67 (Exterior)	53	54	53	No
Outlying Receiver P5: Residential on Forest Ave. between Lincoln Parkway & Elmwood Avenue. - Activity Category B (residential area).	B	67 (Exterior)	59	59	59	No

Notes: An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where “approach” is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

Exhibit 4.4.17-2
Analysis Area G (Delaware Park)
Eastbound Side of NYS Rte. 198 Between Lincoln Ave and Pedestrian Bridge
Traffic Noise Levels (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Equivalent Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact[1]
					No-Build	**Build**		
G1	Delaware Park	C (67)	2	66	66	66	0	**YES**

Notes: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where “approach” is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

Exhibit 4.4.17-3
Analysis Area H (Delaware Park)
Westbound Side of NYS Rte. 198 Between Lincoln Ave and Delaware Ave
Traffic Noise Levels (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units or Equivalent	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact(1)
					No-Build	Build		
H1	Delaware Park	C (67)	4	68	68	68	0	**YES**
H2	Nottingham	B (67)	6	60	60	60	0	**NO**
H3	Nottingham	B (67)	4	61	61	61	0	**NO**
H4	Nottingham	B (67)	1	60	61	60	0	**NO**

Notes: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where "approach" is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

Exhibit 4.4.17-4
Analysis Area L
Eastbound Side of NYS Rte. 198 Between Parkside Avenue and Main Street
Traffic Noise Levels (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact(1)
					No-Build	Build		
L1	Humboldt Pkwy 1	B (67)	3	69	69	69	0	**YES**
L2	Humboldt Pkwy 2	B (67)	2	71	71	71	0	**YES**
L3	Humboldt Pkwy 3	B (67)	2	71	71	71	0	**YES**
L4	Humboldt Pkwy 4	B (67)	4	71	71	71	0	**YES**
L5	Humboldt Pkwy 5	B (67)	1	71	71	71	0	**YES**
L6	APT_BLD 2nd Fl.1	B (67)	2	65	65	65	0	**NO**
L7	APT_BLD 2nd Fl.2	B (67)	3	65	66	65	0	**NO**
L8	APT_BLD 2nd Fl.3	B (67)	3	68	68	68	0	**YES**
L9	APT_BLD 2nd Fl.4	B (67)	3	69	69	69	0	**YES**
L10	APT_BLD 3rd Fl.1	B (67)	2	67	67	67	0	**YES**
L11	APT_BLD 3rd Fl.2	B (67)	3	67	68	67	0	**YES**
L12	APT_BLD 3rd Fl.3	B (67)	3	70	70	70	0	**YES**
L13	APT_BLD 3rd Fl.4	B (67)	3	70	71	70	0	**YES**

Notes:
(1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where "approach" is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.
(2) – Exterior frequent use areas (balcony/deck locations) were identified and placed in the model for Apartment Building 2nd & 3rd floors.

Exhibit 4.4.17-5
Analysis Area M
Westbound Side of NYS Rte. 198 Between Parkside Avenue and Main Street
Traffic Noise Levels (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact(1)
					No-Build	Build		
M1	Humboldt Pkwy	B (67)	1	69	69	69	0	YES
M1A	Hospital (Interior)	D (52)	1	37	37	37	0	NO
M2	Humboldt Pkwy	B (67)	4	71	71	71	0	YES
M3	Humboldt Pkwy	B (67)	3	70	70	70	0	YES
M4	Humboldt Pkwy	B (67)	7	69	70	69	0	YES
M5	Humboldt Pkwy	B (67)	3	66	67	66	0	YES
M6	Humboldt Pkwy	B (67)	2	66	66	66	0	YES
M7	Humboldt Pkwy	B (67)	2	66	66	66	0	YES
M8	Humboldt Pkwy	B (67)	1	66	67	66	0	YES

Notes: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where “approach” is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C, and 52 dB(A) for Activity Category D.

Exhibit 4.4.17-6
Analysis Area N
Eastbound Side of NYS Rte. 198 Between Kensington and East Limits
Traffic Noise Levels (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact(1)
					No-Build	Build		
N1	Humboldt Pkwy	B (67)	12	67	67	67	0	YES
N2	Humboldt Pkwy	B (67)	4	67	68	68	1	YES
N3	Humboldt Pkwy	B (67)	5	68	69	69	1	YES
N4	Humboldt Pkwy	B (67)	4	70	71	71	1	YES
N5	Humboldt Pkwy	B (67)	5	71	72	72	1	YES
N6	Humboldt Pkwy	B (67)	2	72	72	72	0	YES
N7	Humboldt Pkwy	B (67)	4	68	68	68	0	YES
N8	Humboldt Pkwy	B (67)	3	67	68	68	1	YES
N9	Humboldt Pkwy	B (67)	1	69	69	69	0	YES
N10	Humboldt Pkwy	B (67)	4	67	67	67	0	YES
N11	Humboldt Pkwy	B (67)	4	68	68	68	0	YES
N12	Humboldt Pkwy	B (67)	7	68	68	68	0	YES
N13	Humboldt Pkwy	B (67)	2	68	69	69	1	YES

Notes: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where “approach” is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

Exhibit 4.4.17-8
Analysis Area O
Westbound Side of NYS Rte. 198 Between Kensington and East Limits
Traffic Noise Levels (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact[(1)]
					No-Build	Build		
O1	Humboldt Pkwy	B (67)	4	68	68	69	1	**YES**
O2	Humboldt Pkwy	B (67)	1	67	67	68	1	**YES**
O3	Humboldt Pkwy	B (67)	4	67	67	68	1	**YES**
O4	Humboldt Pkwy	B (67)	4	68	68	69	1	**YES**
O5	Humboldt Pkwy	B (67)	2	70	70	70	0	**YES**
O6	Humboldt Pkwy	B (67)	1	70	70	71	1	**YES**
O7	Humboldt Pkwy	B (67)	9	70	70	70	0	**YES**
O8	Humboldt Pkwy	B (67)	3	69	69	69	0	**YES**
O9	Humboldt Pkwy	B (67)	3	67	67	67	0	**YES**
O10	Humboldt Pkwy	B (67)	4	66	67	67	1	**YES**
O11	Humboldt Pkwy	B (67)	3	66	67	67	1	**YES**
O12	Humboldt Pkwy	B (67)	3	64	64	64	0	**NO**

Notes: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where “approach” is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

The results indicate that the Build Alternative would reduce traffic noise levels at 2 of the 20 project analysis areas (B and E), and at 16 of the 20 project analysis areas (A, C, D, F, G, H, I, J, K, L, M, P1, P2, P3, P4, and P5) the noise levels are not anticipated to change. At analysis areas N and O, the greatest increase in traffic noise levels from the existing conditions to the Build Alternative is 1 dB(A). According to the FHWA’s “Highway Traffic Noise: Analysis and Abatement Guidance,” 3 dB(A) increases are barely perceptible by the human ear.

The predicted future traffic noise levels approach or exceed the NAC established for Land Use Categories B and C for 45 analysis sites (145 dwelling unit receptors and 6 equivalent residential receptors for park areas). For the remaining sites, the future predicted traffic noise levels do not approach or exceed the NAC, nor do they cause substantial increases of 6 dB(A) or greater over existing noise levels. Noise impacts were identified at receivers within analysis locations G, H, L, M, N, and O due to predicted future traffic noise levels approaching or exceeding the NAC established for Land Use Categories B and C (see Table 7-2 through Table 7-7). When noise impacts are predicted for a project, noise abatement must be considered for each impact. Therefore, noise abatement measures were considered for the Build Alternative.

As stated in NYSDOT Noise Policy, noise abatement measures must be examined and evaluated for all areas where traffic noise impacts are determined to occur. The noise abatement measures listed in 23 CFR 773.13(c) and NYSDOT Noise Policy must be considered. The four main types of noise abatement measures include the following:

1. Traffic management measures such as traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.

2. Alteration of horizontal and vertical alignments.

3. Construction of noise barriers.

4. Acquisition of real property to serve as a buffer zone.

Noise abatement measures must be considered both feasible and reasonable to warrant implementation. Feasibility involves the practical capability of the noise abatement measure being built as well as the capacity to achieve a minimum reduction in noise levels. Reasonableness deals with the social, economic, and environmental factors to be considered when evaluating abatement measures.

A qualitative analysis indicated that abatement through traffic management measures, alteration of horizontal and vertical alignments, or acquisition of real property to serve as a buffer zone are not considered feasible and/or reasonable. To determine whether noise barriers would be feasible and reasonable for this project, quantitative noise barrier analyses were performed for the analysis areas G, H, L, M, N, and O. Figures showing the locations of the analyzed barriers are located within the Noise Analysis Report in **Appendix B10**.

The evaluated noise barriers for analysis areas G and H were not deemed reasonable because the square-foot of wall per benefited receptor value was above the allowable 2,000 square-foot value. The evaluated noise barrier for analysis area L was not deemed reasonable because the majority of the benefited receptors would not achieve the noise reduction design goal. The remaining evaluated barriers (M, N and O) were not deemed feasible because none of these barriers would provide the minimum 5 dB(A) reduction to the majority of impacted receptors. As none of the barriers were both reasonable and feasible, viewpoints were not solicited.

Additional details on the analysis results and abatement considerations are provided in the Noise Study Report in **Appendix B10**.

Construction noise is also a consideration for this project; however, construction noise differs from traffic noise in the following ways:

- Construction noise only lasts for the duration of the construction contract.
- Construction activities are generally short term.
- Construction noise is intermittent and depends on the type of operation.

Short-term construction noise from activities, such as earthwork, land clearing, pile driving, paving, and structure demolition and construction, could affect abutting receptors. Noise and vibration levels due to construction at specific locations are a function of the number and types of construction equipment that would be utilized for a specific phase of project construction, and are highly variable throughout the various phases of construction.

As discussed in **Section 3.3.1.7(5)**, night time construction would generally be avoided but may need to be considered on a limited basis to avoid traffic congestion that would result if those operations were performed during daytime hours. The City of Buffalo noise ordinance (Chapter 293) prohibits unreasonable noise, which includes construction work between the hours of 9 PM and 7 AM. NYSDOT activities are not subject to local noise ordinances; however, NYSDOT would make reasonable effort to comply with the provisions of the City of Buffalo's ordinance.

Construction noise abatement measures would be evaluated during final design. Examples of construction noise abatement techniques include locating high noise level equipment away from sensitive receptors, awareness of potential noise problems and complaints, and maintenance of proper muffling devices.

4.4.18 Asbestos

EXISTING CONDITIONS

An asbestos assessment preliminary investigation was performed to identify asbestos containing materials (ACMs) that are expected to be disturbed as a result of this project. The asbestos assessment included a review of available record plans (including bridges, roadways, culvert and ramps); discussions and/or correspondence with utility companies and municipalities with utilities in the study area; and a field walkover inspection. No sampling/testing of suspected ACM was performed because no accessible suspect ACMs were identified. The Asbestos Assessment Preliminary Investigation Memorandum is included as **Appendix B11**.

Suspect ACMs were identified within numerous record plans. Two-inch "fiber or asbestos cement" conduit was identified for approximately 27,000 linear feet of the street lighting along the corridor. Details on the record plan findings are provided in the Asbestos Assessment Preliminary Investigation Memorandum (**Appendix B11**).

Under an unrelated NYSDOT project (PIN 5811.88), asbestos inspections of BIN 1039970 (Elmwood Ave Ramp over Scajaquada Creek) and BIN 1039989 (Route 198 Bridge over Scajaquada Creek) revealed the presence of compressed asbestos sheet packing between the abutments and the bridge deck on both ends of both bridges (approximately 170 square feet for BIN 1039970 and 185 square feet for BIN 1039989). The compressed asbestos sheet packing is still present since it was not scheduled to be removed as part of PIN 5811.88.

Under another unrelated NYSDOT project (PIN 5470.24), an asbestos inspection of BIN 1047259 (NYS Route 198 over Delaware Avenue) identified asbestos-containing gaskets on five of the eight wall mounted light fixtures within the arch barrels of the bridge (approximately eight linear feet total). The light fixtures were not replaced as part of the previous project and the gaskets still remain.

POTENTIAL EFFECTS: BUILD ALTERNATIVE

There are suspect ACMs that could be involved in construction of the Build Alternative. Further investigation would be needed to confirm ACMs and amounts during final design and construction as indicated below.

During final design, representative samples of the "fiber or asbestos cement" conduit for the street lighting that was identified by review of the record plans would be collected and analyzed to positively identify the asbestos content rather than assuming it to be asbestos-containing. The large quantity of conduit would have a substantial cost impact on the project if it is handled as asbestos-containing when it may contain non-asbestos fibers.

Suspect materials identified as present on the record plans that would be disturbed under the Build Alternative would be sampled during construction. These identified suspect materials include, but are not limited to:

- Bituminous material (joint or filler material)
- Expansion joints
- Waterproofing paper
- Membrane waterproofing
- Pipe insulation (barrier jacket)
- Asphalt roofing material
- Grout
- Caulking compound for light poles

- Sealing compound
- Waterstop
- Compression seal
- Felt packing

Until sampled, these materials are assumed to be asbestos-containing. The quantities of each of these suspect ACMs to be disturbed would be assessed during final design.

Asbestos-containing transite ducts reported by Verizon Communications would be assessed during final design to determine if they would be impacted by the project. The locations of these ducts are Elmwood Avenue, Main Street and Loring Avenue. Some of the Verizon transite ducts have been removed in the area of the Elmwood Avenue Bridge under PIN 5470.30.

Any removal/disturbance of ACMs would be performed by a New York State licensed asbestos abatement contractor. Blanket Variance 14 would be utilized for the removal of the identified asbestos-containing materials.

If any additional suspect material were observed during the construction period, the Construction Inspector/ Engineer in Charge would be immediately notified. Representative samples of the suspect materials would be collected and analyzed for asbestos content in accordance with NYSDOT procedures.

After the recommended sampling and asbestos assessment were completed, Asbestos Special Notes and Specifications would be prepared to address proper mitigation and disposal of the asbestos materials. These Asbestos Special Notes and Specifications would be prepared by personnel with Asbestos Designer Certification.

With the appropriate abatement measures for any ACM in place, there would be no effect to/from asbestos containing materials.

4.4.19 Hazardous Waste and Contaminated Materials

Transportation projects that include the acquisition of right-of-way; construction easements; or excavation or other disturbance of soils as part of planned construction activities, relocation of utilities, and/or structure demolition or modification have the potential to encounter hazardous and/or contaminated (non-hazardous) materials. The presence or release of these materials on construction sites can expose workers, the general public, and the environment to these materials. In addition, the unexpected encounter of either known or suspect hazardous and/or contaminated materials during construction can lead to project delays and add substantial cost to a project.

Established environmental regulations would be followed during the removal and disposal of identified hazardous waste, non-hazardous solid waste, or construction and demolition debris. Hazardous wastes are listed wastes that are ignitable, corrosive, reactive, or toxic. Non-hazardous solid waste includes materials such as general trash, asbestos containing materials, non-hazardous paint waste, most petroleum contaminated soil, and empty drums and tanks. The storage, transportation, and disposal of contaminated and hazardous materials are regulated at the federal level by the USEPA. At the state level, most of the environmental regulations are promulgated and enforced by the NYSDEC.

The management of subsurface contamination is subject to various regulatory programs including the Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, commonly referred to as “Superfund”) and Resource Conservation and Recovery Act (RCRA), as well as the state Inactive Hazardous Waste Disposal Site Remedial Program, Brownfield Cleanup Program, New York State Environmental Conservation Law and Article 12 of the New York State Navigation Law (relating to petroleum spills). The NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10)

establishes methods for site investigation and clean-up, and the Solid Waste Management Facilities Regulations control disposal of excavated materials (6NYCRR Part 360).

The NYSDOT requires that a contaminated materials and hazardous substances assessment be performed to identify the potential of encountering hazardous and non-hazardous contaminated materials as a result of the planned construction work. The environmental assessment screens each of the properties under review for possible contamination, focusing on current and previous activities, a review of environmental records and files, historical maps, and a review of the surrounding land use. The assessment is intended to identify properties with conditions that indicate an existing release, a past release, or a material threat of a release of hazardous substances or petroleum products into structures or into the ground, groundwater, or surface water that may affect the proposed construction zone or right-of-way acquisitions for the project. The methodology described in the NYSDOT Environmental Manual (TEM), Section 4.4.20, Contaminated Materials and Hazardous Substances, was followed during the assessment for this project. The procedures described in the TEM also generally follow those steps outlined in the American Society for Testing and Materials (ASTM) Standard Practice E 1527-05, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," and are also consistent with ASTM Standard Practice E 1528-06, "Standard Practice for Limited Environmental Due Diligence; Transaction Screen Process," and ASTM Standard Practice E 1903-97, "Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process," but are adapted to more closely meet the needs of NYSDOT projects.

EXISTING CONDITIONS

A Hazardous Waste/Contaminated Materials Site Screening was conducted in September 2008 (updated in February 2013). See **Appendix B12**. The Hazardous Waste/Contaminated Materials Site Screening for the Build Alternative included:

- A review of NYSDEC and USEPA regulatory databases.
- A review of various Erie County, City of Buffalo, and NYSDEC reports on the Buffalo River watershed and other projects in the surrounding area.
- A walkover reconnaissance of the project area on June 12th and July 14th, 2008.
- A review of local municipal records including city directories.
- A review of historical aerial photographs.
- A review of available Sanborn Fire Insurance maps.
- A review of topographic, wetland and other maps.
- Review of identified and readily ascertainable environmental reports for subject properties in proximity to the project area.
- Discussions and written correspondence with local government, fire, health, and regulatory agency (e.g., NYSDEC, City of Buffalo Permit Office, City of Buffalo Fire Department records, Department of Health records) department officials.

The general area of the City that the project corridor is located in has a long history of commercial, transportation, manufacturing and industrial uses (stockyards, railroad yards, factories, oil storage warehouses, machine shops, paint manufacturers, and lumber yards) and a history of physical alterations, including filling activities with the potential for these materials to act as sources of contamination.

Forty-two (42) sites (A through AP) were identified within the project study area during the Preliminary Screening Investigation Phase that may pose environmental risk to the project (see **Exhibit 4.4.19-1** in **Appendix B1** for the project study area and the identified sites of concern).

POTENTIAL EFFECTS: BUILD ALTERNATIVE

The sites identified in the Preliminary Screening Investigation Phase would be investigated further where the Build Alternative would require excavation or right-of-way acquisition in these areas. Where the Build Alternative would impact identified areas of environmental concern, a Field Sampling Plan (FSP) would be prepared for the performance of a subsequent Detailed Site Investigation (DSI). For many of the identified sites, multiple environmental concerns have been identified (e.g., petroleum, underground storage tanks (UST), industrial use, fill), which reflects on the changing land uses throughout the centuries of occupation in this area. Detailed findings for each site are described in the Preliminary Screening Investigation Report. Environmental concerns identified through the preliminary screening include the following:

- Due to the urban nature of the project study area, urban/industrial fill is likely present throughout the corridor. In addition, historic research has confirmed that substantial amounts of fill have been placed at Sites A (filled creek/lake banks), AH (filled quarry), and AO (filled quarry).

- There are numerous industrial sites that border Scajaquada Creek (Site A) that may have contaminated the creek sediments. The NYSDEC has indicated that there are also numerous active remediation projects along Scajaquada Creek and contamination is known to exist along portions of the creek. See **Section 4.4.2** regarding contaminated creek sediments.

- Thirty-five (35) of the 42 sites contain or have contained petroleum USTs or have petroleum spills on record. These sites are of potential environmental concern for petroleum contamination and/or abandoned underground storage tanks.

- Twenty-eight (28) of the 42 sites are or have been auto repair shops or manufacturing facilities, including metal shops, furniture manufacturers, window manufacturers, foundries, steel companies, paint, varnish and lacquer manufacturers and auto part manufacturers.

- Two of the sites are active railroad lines (Sites D and AM). Contamination typically found along railroad lines includes partially combusted fossil fuels consisting of polynuclear aromatic hydrocarbons; leachate from creosote-preserved railroad ties; pesticides used in maintenance of the corridor; strong acid or alkaline materials; spent cleaning and degreasing solvents; ignitable paint wastes; used oil; and lead contamination from older freight cars with plane bearings, as well as other heavy metals including chromium and arsenic.

- Two of the 42 sites are former transformer lots (Sites E and G) and one is a contractor’s storage area (Site AD) that are all of concern due to past potential usage of petroleum products and other hazardous materials, such as solvents, metals and polychlorinated biphenyl (PCB) oils.

- All painted steel bridges requiring steel work that will necessitate paint removal, and that have been constructed and painted prior to 1989, are assumed to be covered with lead based paint (LBP), unless the bridge has been blast cleaned and repainted to the Society for Protective Coating's (SSPC) surface preparation standard SP-10 (Near White Blast Cleaning). For bridges that have not been blast cleaned and repainted to SSPC SP-10 standards, the NYSDOT Environmental Manual indicates that even after the original LBP is removed via abrasive blasting and a bridge has been repainted with non-lead paint, the waste generated during abrasive blasting often exceeds the regulatory threshold for hazardous lead waste. NYSDOT has indicated that BIN 1039990 (Pedestrian Bridge over NYS Route 198) has been blast cleaned and repainted to SSPC SP-10 standards. Therefore, with the exception of BIN 1039990, all other painted steel bridges within the corridor that will require steel work, and paint removal as part of the work, would be assumed to be coated with LBP and would be handled as such during construction.

No detailed soils investigation or sampling has occurred as a result of this project to date. Construction or right-of-way acquisition is anticipated along only five (A, X, Y, AF and AG) of the 42 sites. During final design, the proposed areas of disturbance would be assessed and a determination made as to whether soil sampling should take place in support of the proposed design.

Detailed hazardous waste/contaminated materials site investigations (Phase II Field Studies) would be performed at those sites with the greatest likelihood of contamination, where substantial soil disturbance is proposed, and where historical usage and/or current environmental information identifies potential concern for property acquisition costs. The scope of the environmental investigation would likely include drilling investigations conducted with a direct push "hydraulic" rig or rotary drill rig to collect soil samples for retrieval and examination. Soil samples would be collected and analyzed on a case-by-case basis for parameters such as Target Compound List (TCL) and Target Analyte List (TAL) parameters for volatile, semi-volatile, pesticides, PCBs, and metals including mercury, cyanide and hexavalent chromium. If the results indicate that the sample has the potential to be hazardous, the soil sample would be further analyzed under Toxicity Characteristic Leaching Procedure (TCLP) methodology (EPA method 1311) for the parameter(s) in question. This additional TCLP analysis would allow for the determination of whether the samples meet the definition of RCRA hazardous waste. The results of these field studies would provide information to support the development of environmental remediation cost estimates and to determine budgetary allowances that should be set aside for construction.

If it is determined that construction would disturb a contaminated site, impacts would be limited to the construction phase and may include the potential exposure to on-site workers and disposal of contaminated materials removed during construction. If contaminated soil is found to be a concern for this project, the final design documents would include the development of drawings, specifications and estimates and the potential requirement of a soil management plan that addresses how soil and sediment are to be handled.

To identify how contamination that is discovered in the field would be addressed, the Contractor would be required to prepare a site-wide Soil Management Plan prior to the start of work outlining procedures to be followed any time evidence of contamination, and/or potential contamination, is suspected or identified. Once evidence of possible contamination is identified by the Contractor in the field, an Environmental Monitor would be called by the Contractor to assist with the screening and management of soils that show signs of contamination (i.e., strange or noxious odors, unnatural colors or sheen, odors characteristic of petroleum or solvent contamination, elevated volatile vapor readings as measured by field screening instruments). These measures would allow for the protection of on-site workers, collection of necessary samples, and separation of contaminated from non-contaminated soil. As warranted, ambient air would be monitored for the protection of on-site workers and soil screening would be performed through visual observations and use of a photoionization detector (PID) or similar instrument. The Environmental Monitor would follow the procedures described in a Field Organic Vapor Monitoring Plan prepared by the Contractor.

However, not all contaminated sites exhibit field identifiable signs of contamination such as petroleum odors, unnatural colors or sheen, or elevated volatile vapor readings as measured by field screening instruments. During construction, soils excavated from industrial and commercial sites identified in this assessment as having the potential for contamination would be closely reviewed and characterized by the Contractor to coordinate their proper management and disposal. The establishment and use of an excavated soil laydown yard(s) would be a necessary component of the Soil Management Plan to provide a means to stockpile and test suspect soils generated during this project. Testing of materials associated with historical industrial property uses would be conducted before releasing soils for reuse or disposal.

Contaminated soils would be managed in areas identified for material stockpiles or direct loaded for transport to an approved landfill. Stockpiled soils would be placed on polyethylene sheeting and covered with sheeting or an equivalent material and properly weighted to prevent contaminated runoff from precipitation and the release of odors. Soils stored in roll-off containers awaiting transport would be

completely covered and secured with waterproof tarpaulins. During transport contaminated soils shall be covered to control dust emissions. Covering the materials during stockpile and transport would mitigate potential public exposure to dust and contamination.

4.5 Construction Effects

Construction effects would be temporary and would cease with the completion of construction. Although the project would be planned, designed, scheduled, and staged to minimize disruption to abutting communities and the environment during construction, short term impacts would occur.

Section 3.3.1.7(5) Work Zone Safety & Mobility includes a discussion of conceptual construction staging and construction considerations. The construction of the Build Alternative would include pavement reconstruction; milling and resurfacing; installation of curb and barrier, drainage, lighting, and signing; landscaping; striping; shared-use path construction; sidewalk construction; footpath construction; parking area reconstruction; relocation of an affected statue; installation of gateway features; and the removal of existing pavement and other features.

As discussed in **Section 3.3.1.7(5)**, rather than a primary full-time detour, temporary (and perhaps long-term) lane closures would be required to construct the project. Night time construction would generally be avoided but may need to be considered on a limited basis. Temporary ramp controls and ramp closures with local detours would also be needed. Short-term lane closures would be necessary to build certain elements of the design. Area schools, hospitals, police, fire departments and other community representatives would be advised of traffic patterns and detours during construction. Pedestrian and bicycle accommodations (including shared-use paths, sidewalks, and footpaths) would be maintained throughout the duration of construction.

A condition where NYS Route 198 would be reduced to one through travel lane in each direction between Grant Street and Parkside Avenue (Alternative 3) was studied during the scoping phase of this project. Traffic diversion to the local street network was projected to affect 12 intersections adjacent to NYS Route 198 and involving the streets listed below. Note that traffic impacts due to construction staging would be temporary, and at no time during construction would the entire length of NYS Route 198 be restricted to one through travel lane in each direction, therefore the scoping analysis is considered conservative as it applies to work zone traffic control.

- Hertel Avenue;
- Amherst Street;
- Middlesex Road;
- Nottingham Terrace;
- Rockwell Road;
- Forest Avenue;
- Delavan Avenue;
- Elmwood Avenue;
- Delaware Avenue; and
- Main Street.

Temporary effects to adjacent neighborhoods could include:

- Traffic congestion and detours;
- Presence of construction equipment, materials and staging areas;
- Noise and vibrations from construction equipment and vehicles;
- Airborne dust and possible mud on roadway surfaces; and
- Removal of or damage to vegetation (e.g., trees, shrubs, grass).

The NYSDOT would review potential traffic signal optimizations and/or other temporary traffic control measures during final design in order to address and minimize the anticipated impact of detoured traffic on these adjacent local streets.

For residents living adjacent to the roadway alignment, materials stored and construction equipment used for the project could be visually displeasing. This is a temporary condition and would not result in long-term effects. The construction contract documents would stipulate that the contractor must maintain a clean and orderly worksite and would include metrics for determining compliance, provisions for enforcement, and penalties for non-compliance.

Views from and of the roadway would be temporarily affected by the presence of heavy machinery, materials, and temporary barriers used to separate the flow of traffic from construction activities. Sight distances and views towards the adjacent areas could be limited due to construction barriers and equipment. Viewer sensitivity during construction would be considered low for motorists passing through the corridor. Other viewer groups include residents, park and trail patrons, and college museum patrons (see **Appendix B7**). Since construction would take place in stages, impact on these viewer groups would be relatively short in duration for the particular areas of interest.

As discussed in **Section 4.4.8**, a Stormwater Pollution Prevention Plan (SWPPP) would be required for compliance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-15-002). The project SWPPP document would include the following required components: an Erosion and Sediment Control Plan, description of the reduction in stream channel erosion, application of runoff reduction via green infrastructure techniques, prevention of overbank flooding, control extreme flood events (water quantity controls), and stormwater management practices to provide for pollutant removal (water quality controls). A detailed discussion of these required components is provided in **Appendix B5.**

Potential contamination of groundwater and/or soil could occur as a result of leaking construction equipment and/or temporary on-site sanitary storage facilities. Proper maintenance procedures on the construction site would be enforced. Fuel/chemical storage would not be allowed on the job site unless the area is over impermeable ground and provides proper containment to protect against spill contamination. Absorption materials would be available on-site, as necessary to clean up any spills. Any spills (e.g., oil, gasoline, brake fluid, transmission fluid) would be contained immediately and properly disposed off-site. Spills in excess of five gallons would be reported to the NYSDEC, as well as any spills that reach waters or lands of the state or are not cleaned up within two hours of discovery.

Nuisance effects, such as noise, dust, and vibration, would occur temporarily during construction. Typical measures in construction contracts to minimize potential localized air quality effects during construction would be implemented (see **Section 4.4.15** for additional discussion).

As described in **Section 4.4.17**, short-term construction noise could affect abutting receptors. The noise would be temporary in nature and highly variable throughout the various phases of construction. NYSDOT activities are not subject to local noise ordinances; however, NYSDOT would make reasonable effort to comply with the provisions of the City of Buffalo's noise ordinance. Construction noise abatement measures would be evaluated during final design. Examples of construction noise abatement techniques include locating high noise level equipment away from sensitive receptors, awareness of potential noise problems and complaints, and maintenance of proper muffling devices."

Short-term benefits to the project area would occur during the construction phase of the project in the form of increased demand for local materials, services and labor. The short-term increases in employment would be expected to filter through the regional and local economies, generating consumer and business spending.

Overall, no long-term adverse construction-related effects are anticipated for the Build Alternative.

4.6 Indirect and Secondary Effects

Indirect effects are those 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 and water and other natural systems, including ecosystems (40 CFR § 1508.8). For the purposes of this assessment, the term "indirect" is synonymous with "secondary," as is the case with FHWA guidance documents issued on this subject.

As discussed in **Sections 3.3.1.6** and **3.3.1.7**, it was estimated that a 5% traffic diversion would occur along NYS Route 198 as a result of the conversion of the urban expressway to an urban boulevard transportation facility under the Build Alternative. This diversion effect was included in the studies for air quality (**Section 4.4.15** and **Appendix B8**), energy (**Section 4.4.16** and **Appendix B9**) and noise (**Section 4.4.17** and **Appendix B10**). The study area for social impacts (**Exhibit 4.2-1 in Appendix B1**) also included the diversion area. These studies indicate that the Build Alternative would not result in adverse effects. Furthermore, this area of the City of Buffalo is primarily built out with little potential for new development; however, there are areas with a potential for redevelopment. The traffic diversion would not be anticipated to cause any such redevelopment.

The Build Alternative would provide additional connections for bicycles and pedestrians between both sections of Delaware Park on either side of NYS Route 198 and between the park and adjacent neighborhoods. These connections would result in beneficial social impacts as described in Section 4.2. The connections would also enhance the redevelopment activities in adjacent areas being generated by the colleges and by other redevelopment efforts in the study area (see **Section 4.7**). It is anticipated that the additional connections in the Build Alternative, combined with the other redevelopment efforts, would increase the use of the park and the redeveloped areas. This would increase economic benefits to the study area through tourism and other uses of the redeveloped facilities. Since this growth would be redevelopment, adverse effects to natural resources (wetlands, surface waters, groundwater, stormwater, and ecology) would not be anticipated.

Overall, no adverse indirect effects to traffic, social, economic or natural resources are anticipated as a result of the proposed action.

4.7 Cumulative Effects

The CEQ regulations (40 CFR Section 1508.7) define "cumulative impact" as:

> "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."

"Reasonably foreseeable" actions are those that are likely to occur or probable, rather than those that are merely possible.[30] Cumulative impacts can result from individually minor but collectively adverse actions taking place over a period of time. Direct and indirect impacts are considered a subset to cumulative impacts.

Direct impacts are identified and discussed in **Sections 4.2** through **4.5**. **Section 4.6** discusses potential indirect or secondary impacts. An assessment of cumulative effects focuses on the combined effects of the proposed action and other actions on specific resources. Thus, this section focuses on the specific resources that would be affected (both positively and negatively) by the Build Alternative, including the following: social effects; economic effects; surface waters; floodplains; ecology and endangered species;

[30] Federal Highway Administration Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process, 2003.

cultural resources; parkland; visual resources; air quality; energy and greenhouse gases; and noise. The cumulative effects are summarized in **Exhibit 4.7-1** at the end of this section.

Past actions include construction of the Scajaquada Expressway through Delaware Park in the 1950s between I-190 and Agassiz Circle to lessen congestion of east-west movement north of Downtown Buffalo and to connect with the then-future NYS Route 33 (Kensington Expressway). The section from Agassiz Circle east to the current NYS Route 33 was completed in 1967. The neighborhoods surrounding the study area were developed over a period of over 130 years starting in 1800, yet the majority of residences (66 percent) were constructed between 1900 and 1930. The study area is essentially built out, with sporadic vacant lots observed most often in the Black Rock and Forest neighborhoods.

On May 31, 2015, in a separate, independent action, the Governor of New York State directed the Commissioner of the NYSDOT to reduce the posted speed limit along NYS Route 198 from 50 miles per hour to 30 miles per hour (see **Section 2.1**).

Present actions include the replacement of the Elmwood Avenue Bridge over NYS Route 198 (BIN 1039959) and Scajaquada Creek under NYSDOT PIN 5470.30 and the City of Buffalo's traffic calming improvements on Parkside Avenue (see **Section 2.2.2.6**).

Recent area growth and development has been fueled by the expansion of Buffalo State College, Medaille College and Canisius College. These institutions are anticipated to continue contributing moderate population and housing growth adjacent to the NYS Route 198 corridor, largely from increased demand for student housing in adjacent neighborhoods. The Facilities Master Plan for Buffalo State College contemplates a 20 percent increase in enrollment by 2023 to approximately 14,000. Each of the above-referenced institutions is located on a compact campus that is generally well-integrated within the surrounding neighborhoods. Adjoining neighborhoods are highly walkable and within close proximity to each institution. The growth of these institutions and the demand generation for off-campus student housing has begun to counteract broader population losses. If current trends are continued, there is the potential for zero population loss or slight population gain within the study area by 2020, largely resulting from increased demand for student housing and the long-term settlement of former students and young adults within the neighborhoods.

Projects anticipated in the study area are described briefly in **Section 2.2.1.2**. These include the redevelopment of the Richardson-Olmsted Complex, improvements in the Buffalo State College Facilities Master Plan, the "Reconstruct Iroquois Drive" project, the "100 on Forest" project, the "Campus Walk One" project and an expansion of the Albright Knox Art Gallery.

In general, redevelopment visions for the study area include a transition from industrial uses to residential and student housing uses within a larger commercial/retail mixed use development. For example, according to the Tonawanda Street Brownfield Opportunity Area Nomination Study, existing infrastructure along Tonawanda Street could support an additional 500 housing units and 500,000 square feet of mixed use commercial/retail space.

The Scajaquada Corridor Project is independent of other transportation projects or activities in the area. The Project has independent utility; serves a discrete purpose (see **Section 1.2.2.1**); connects logical termini (see **Section 2.1.2**); and would not restrict the consideration of alternatives for other reasonably foreseeable transportation improvements. While the Project is completely independent, it is recognized that other projects within the vicinity are being pursued at this time and/or may be pursued to achieve other purposes. These other projects are not connected to, nor are they dependent on, the Scajaquada Corridor Project. They do not satisfy the purpose of the Scajaquada Corridor Project or the realization of its stated objectives. They can proceed prior to, concurrently with, or subsequent to the completion of the Scajaquada Corridor Project. Conversely, the Scajaquada Corridor Project does not influence, restrict, or dictate the consideration of any of the other projects in the vicinity.

The effects associated with the past, present and reasonably foreseeable future actions are discussed below.

4.7.1 Social

The study area for the assessment of social effects is described in **Section 4.2**.

Effects from Past, Present and Reasonably Foreseeable Actions
The effects of the construction of the Scajaquada Expressway (NYS Route 198) have been to divide Delaware Park and the neighborhoods on either side of the corridor. The effects of past actions on the surrounding neighborhood have been to convert undeveloped vacant land into residential, commercial and industrial areas.

Sections 4.2.1 and **4.7** describe future development trends in the study area.

Vacant lots and structures located adjacent to rail corridors in the Black Rock neighborhood have the greatest potential to redevelop over time as infill redevelopment. The largest area of contiguous vacant land, vacant structures, and brownfields are located along Tonawanda Street at the western end of the NYS Route 198 corridor. The industrial districts along Tonawanda Street on the west end of the corridor are anticipated to transition away from industrial zoning upon redevelopment to support a mixed-use core consisting of housing and commercial/retail uses as identified in the Tonawanda Street Corridor Brownfield Opportunity Area (BOA), as well as the proposed Buffalo Green Code Unified Development Ordinance. According to the Tonawanda Street Brownfield Opportunity Area Nomination Study, existing infrastructure along Tonawanda Street could theoretically support an additional 500 housing units and 500,000 square feet of mixed use commercial/retail space.

Effects of Build Alternative
As discussed in **Section 4.2.1**, the Build Alternative would involve minor changes to the overall land use pattern in the study area. One minor change would be in the adjustment between the use of land for transportation and the use of land for parkland as discussed in **Section 4.4.12**. The Build Alternative would enhance the compatibility of the roadway with the unique characteristics of Delaware Park and adjacent land uses.

As discussed in **Section 4.2.2**, the Build Alternative would improve bicycle and pedestrian connectivity between portions of Delaware Park and between neighborhoods and businesses along and across the corridor through new and/or improved bicycle and pedestrian facilities. As discussed in **Section 4.2.3.1**, pedestrian accommodations throughout the Scajaquada Corridor would be substantially improved for the elderly and individuals with disabilities. The Build Alternative would expand connectivity for pedestrians of all ages and improve motorist and pedestrian safety along the corridor by reducing vehicular speeds and increasing pedestrian visibility at crossings.

Cumulative Effects
The Build Alternative combined with that of reasonably foreseeable actions would result in new and enhanced connections to and between existing neighborhoods; within Delaware Park; between Delaware Park and adjacent neighborhoods; and to future residential, institutional and commercial areas.

4.7.2 Economic

Effects from Past, Present and Reasonably Foreseeable Actions
Section 4.3 documents the existing economic conditions, which are influenced by three colleges, cultural amenities and established business districts and commercial corridors.

As described in **Sections 4.2.1** and **4.7**, redevelopment plans within the study area include a transition from industrial uses to residential and student housing uses within a larger commercial/retail mixed use development. The three colleges are anticipated to continue contributing moderate population and

housing growth adjacent to the NYS Route 198 corridor, largely from increased demand for student housing in adjacent neighborhoods.

A separate NYSDOT action in 2015 changed the posted speed limit on NYS Route 198 from 50 miles per hour to 30 miles per hour, as noted in the Executive Summary and **Section 2.1**. Traffic counts at area intersections taken before and after this conversion were compared to assess changes in traffic patterns on the surrounding city street network as a result of this action. While there were increases in traffic volumes noted in some locations, these changes were not to a level such that access to local businesses would be affected. In addition, there have been no comments from the public with regard to excessive traffic congestion affecting the viability of local businesses, the surrounding cultural resources, or educational opportunities.

Furthermore, the measured diversions observed in the field resulting from the change from the previous 50 mile per hour condition to the current 30 mile per hour condition, were similar to those predicted by previous traffic modeling conducted by the NYSDOT in conjunction with the GBNRTC in 2014-2015. The 2014-2015 modeling compared what was then a 50 mile per hour existing condition to several alternatives under consideration, including a 30 mile per hour build alternative with traffic signals. The observed diversions measured after the speed limit change were within five percent of what was predicted by the 2014-2015 modeling. The 2014-2015 modeling of the change from a 50 mile per hour condition to a 30 mile per hour condition did not predict a change in traffic congestion to a degree which would require more than minor mitigation (i.e. signal optimization), or to a degree which would affect surrounding businesses, resources, or educational opportunities. Summaries of the 2014-2015 modeling results are contained in the project design files and are available at the NYSDOT regional office in Buffalo.

Thus, based on traffic counts taken prior and subsequent to the speed limit change, and modeling the difference between the 50 mile per hour previous condition and 30 mile per hour build alternative, it was determined that no adverse economic effects have occurred as a result of the speed limit change.

Effects of the Build Alternative
As discussed in **Section 4.3**, the Build Alternative would improve local connectivity for all modes of travel along the Scajaquada Corridor. The Build Alternative includes several bicycle and pedestrian connectivity improvements along and across the corridor that would enhance access to neighborhood businesses.

The Build Alternative would help to promote the growth of the colleges and surrounding area, and promote economic growth and development in the study area. The enhancement of cultural and recreational amenities along the corridor would continue to promote tourism and the economic contributions from this tourism.

Cumulative Effects
The economic effects of the Build Alternative combined with that of reasonably foreseeable actions would result in more opportunities for tourism and economic growth in the study area.

4.7.3 Surface Waters

Effects from Past, Present and Reasonably Foreseeable Actions
Section 4.4.2 summarizes the existing conditions of the surface waters in the project area. Scajaquada Creek has been heavily impacted by development throughout its watershed. Impacts to Scajaquada Creek, Hoyt Lake and Mirror Lake have also resulted from the construction of the Scajaquada Expressway. Scajaquada Creek is identified in the January 2012 Remedial Action Plan, Stage 2 Addendum to the Niagara River Area of Concern under a Beneficial Use Impairment (BUI) for restrictions on dredging activities. Activities and actions related to the remediation of Scajaquada Creek include sediment studies downstream of Grant Street and an assessment by Buffalo Niagara Riverkeeper and the USACE of the creek just upstream of Hoyt Lake in the Forest Lawn Cemetery. The March 2014 study recommended a remedial investigation, remedial alternatives/feasibility analysis and complete remedial

conceptual designs to facilitate implementation of creek and sediment restoration initiatives within Forest Lawn Cemetery. It also recommended the evaluation and selection of an alternative for a holistic restoration project within the Forest Lawn Cemetery that creates a restored wetland, reconnecting critical floodplain areas and providing floodwater storage and sediment stabilization. As discussed in **Section 4.4.8, t**he existing closed drainage systems for the Scajaquada Expressway consist of drainage inlets and receivers in the median and at the edges of shoulders, connected by series of pipes. None of the stormwater that enters directly into Scajaquada Creek receives any treatment.

Sections 4.2.1 and **4.7** describe future development trends in the study area. Current regulations are in place to minimize adverse impacts to surface waters from future development activities.

Effects of the Build Alternative
As discussed in **Section 4.4.2**, the Build Alternative would include the replacement of two bridges, the rehabilitation of two bridges and two new shared-use-path bridges over Scajaquada Creek. Besides temporary work in the water, minor amounts (approximately 0.03 acres) of permanent fill are anticipated for two of the bridges. **Section 4.4.8** discusses the stormwater effects of the Build Alternative, which includes a 16% decrease in net impervious area. This would result in less stormwater entering the proposed drainage system and would improve the quality of the water entering into the surface waters in the study area.

Cumulative Effects
Based on the effects of the Build Alternative described above, no significant adverse cumulative effects to surface waters are anticipated as a result of the proposed action.

4.7.4 Floodplains

Effects from Past, Present and Reasonably Foreseeable Actions
Section 4.4.5 describes the existing conditions of the floodplain for Scajaquada Creek. The FEMA FIRM and FIS show that the mainline NYS Route 198 would be overtopped in certain areas by the 50-year flood event. Several of the bridges over Scajaquada Creek in the corridor, including the Grant Street ramps, Elmwood Avenue ramps, NYS Route 198, and Lincoln Parkway are shown as having zero or negative freeboard for the 50-year event.

Sections 4.2.1 and **4.7** describe future development trends in the study area. Current regulations are in place to minimize adverse impacts to floodplains from future development activities.

Effects of the Build Alternative
As discussed in **Section 4.4.5**, the Build Alternative is located in a floodplain and meets the four requirements of 6 NYCRR 502-Floodplain Management Criteria for State Projects. There would be no adverse effects on the floodplain from the Build Alternative.

Cumulative Effects
Based on the effects of the Build Alternative described above, no significant adverse cumulative effects to floodplains are anticipated as a result of the proposed action.

4.7.5 Ecology and Endangered Species

Effects from Past, Present and Reasonably Foreseeable Actions
Section 4.4.9 describes the existing conditions of the ecology for the study area. Within the study area, the Scajaquada Creek corridor is a narrow band of naturalized riverine and riparian covertypes within the urban area of the City of Buffalo. Within the larger “green belt” made up by the park lawns, trees, and meadow covertypes of the adjacent Forest Lawn Cemetery, Delaware Park, and museum grounds, the riparian covertypes serve especially as a terrestrial and aquatic wildlife corridor. Monocultures of invasive vegetative species are prevalent in several locations. The study area includes suitable habitat for the federal and New York State listed northern long-eared bat (NLEB).

Sections 4.2.1 and **4.7** describe future development trends in the study area. Since future growth is anticipated to primarily consist of redevelopment, only minimal effects to ecology would be expected. Regulations are in place to minimize adverse effects to the NLEB.

Effects of the Build Alternative
As described in **Section 4.4.8**, the Build Alternative would include a decrease in the amount of impervious area and an increase in landscaped area (see **Section 3.3.4**). Construction of the Build Alternative would remove up to approximately 346 trees across 78 acres. Consultation under Section 7 of the ESA determined that the project "May Affect, but is Not Likely to Adversely Affect" the NLEB.

Cumulative Effects
Due to the urban nature of the study area, impacts to the general ecology of the area from the Build Alternative combined with reasonably foreseeable development and redevelopment would be minimal. Consultation under Section 7 of the ESA determined that the project "May Affect, but is Not Likely to Adversely Affect" the NLEB. No significant adverse cumulative effects to the NLEB are anticipated as a result of the proposed action.

4.7.6 Cultural Resources

Effects from Past, Present and Reasonably Foreseeable Actions
The historic and cultural resources in the Area of Potential Effect (APE) are documented in **Section 4.4.11** and in **Appendix B6**. One of these resources is the National Register-listed Delaware Park, which was bisected by the construction of the Scajaquada Expressway. Archaeological resources were also identified in the APE. Archaeological resources in and in the vicinity of the APE have been impacted in the past by urbanization.

Sections 4.2.1 and **4.7** describe future development trends in the study area. Since future growth is anticipated to primarily consist of redevelopment, minimal effects to archaeological resources would be expected. Historic preservation regulations are in place that require agencies to consider the effects of their undertakings on cultural resources.

Effects of the Build Alternative
As described in **Section 4.4.11,** the Build Alternative would have an "Adverse Effect" under Section 106 of the National Historic Preservation Act as a result of anticipated physical impacts on National Register-eligible archaeological properties located within the APE in Delaware Park. The Build Alternative does include elements designed to retain the historic character and integrity of Delaware Park and other historic properties.

Cumulative Effects
A Memorandum of Agreement (MOA) was developed for the project to resolve adverse effects on identified archaeological properties. The MOA is provided in **Appendix B6**. No significant adverse cumulative effects related to cultural resources are anticipated as a result of the proposed action.

4.7.7 Parkland

Effects from Past, Present and Reasonably Foreseeable Actions
The construction of the Scajaquada Expressway bisected Delaware Park filled in a large part of the original "Gala Water" (now Hoyt Lake) in the park. Other events and developments unrelated to NYS Route 198 have also changed the park from its original Olmsted design.

Sections 4.2.1 and **4.7** describe future development trends in the study area. It is not anticipated that future development activities would directly affect the parkland resources in the study area. It is anticipated the BOPC would continue efforts toward implementation of their restoration plan.

Effects of the Build Alternative

As discussed in **Section 4.4.12**, the Build Alternative would have a beneficial effect for use of the park by pedestrians and bicyclists. The Build Alternative would result in a net decrease in pavement/hardscape area of 2.0 acres, or 13% less hardscape area within the parkland area. With the removal of hardscape area, the amount of greenspace in the parkland would therefore be increased. The Build Alternative would provide additional connectivity within the parklands and to the adjacent neighborhoods. The Build Alternative would convert approximately 2.7 acres of parkland to transportation use; however, it would also make approximately 5.6 acres currently in transportation use available as parkland. This would result in a net increase in parkland of 2.9 acres.

Cumulative Effects
The Build Alternative combined with BOPC's continued efforts toward implementation of their restoration plan would result in beneficial effects to parkland.

4.7.8 Visual Resources

Effects from Past, Present and Reasonably Foreseeable Actions
The expressway corridor is currently visually in contrast with its surrounding neighborhood. The width of the corridor and the area devoted to interchanges with neighborhood streets is out of context and scale, and detracts from the historic landscapes of Delaware Park and the viable neighborhoods along its length.

Sections 4.2.1 and **4.7** describe future development trends in the study area. It is anticipated that reasonably foreseeable future development activities would either enhance or have a neutral effect on the visual resources in the study area.

Effects of the Build Alternative
As described in **Section 4.4.13** and **Appendix B7**, the Build Alternative would visually transform the existing urban expressway into an urban boulevard, providing enhanced compatibility with adjacent land uses. The changes under the Build Alternative would largely be positive given the reduction of pavement areas; narrowed shoulders; the elimination of ramps and overhead highway sign structures; overall elimination of many high-speed expressway infrastructure elements; and the introduction of a curbed landscaped center median and ornamental lighting.

Cumulative Effects
The positive visual effects under the Build Alternative combined with the effects of reasonably foreseeable development activities would have an overall beneficial effect on visual resources in the study area.

4.7.9 Air Quality

Effects from Past, Present and Reasonably Foreseeable Actions
Erie County is classified as attainment for all current National Ambient Air Quality Standards (NAAQS). As part of the air quality analysis for the project, for the purpose of evaluating cumulative effects associated with the speed limit change from 50 mph to 30 mph (which was implemented independent from the current action), the 50 mph conditions without the proposed project were assessed (see **Appendix B8**). The analyses for the 50 mph conditions consisted of a mesoscale analysis for criteria pollutants and mobile source air toxics and a microscale analysis for particulate matter. The analyses of the 50 mph conditions used traffic data that had been developed prior to the 2015 speed limit change.

Exhibits 4.7.9-1 and **4.7.9-2** present the results of the mesoscale analysis for criteria pollutants and mobile source air toxics for the 50 mph conditions without the project. For comparison purposes, the results for the No-Build Alternative, which accounts for the speed limit change, are included. The speed limit change lowered the VMT by approximately 20% for all of the analysis years (2020, 2030 and 2040). Emissions of VOC, NOx, CO, PM_{10} and $PM_{2.5}$ are all lower under the No-Build Alternative as compared to the 50 mph conditions without the proposed project. In all analysis years, mobile source air toxics are lower by 12.5% to 19.6%.

Exhibit 4.7.9-1 Mesoscale Criteria Pollutants (tons/year)									
Pollutant	2020			2030			2040		
	50 mph Condition Without Project	No-Build	% Difference	50 mph Condition Without Project	No-Build	% Difference	50 mph Condition Without Project	No-Build	% Difference
VMT (miles/year)	54,186,289	43,334,342	-20.0%	55,278,368	44,244,215	-20.0%	56,361,650	45,166,927	-19.9%
VOC	82.15	78.85	-4.0%	54.33	52.18	-4.0%	41.62	39.93	-4.1%
NOx	309.23	303.62	-1.8%	285.07	282.29	-1.0%	257.48	255.67	-0.7%
CO	335.82	290.38	-13.5%	236.98	210.34	-11.2%	203.92	182.74	-10.4%
PM_{10}	8.08	7.45	-7.8%	6.11	5.50	-10.0%	4.30	3.73	-13.3%
$PM_{2.5}$	4.86	4.59	-5.6%	2.88	2.72	-5.6%	1.11	1.00	-9.9%

Exhibit 4.7.9-2 Mesoscale Mobile Source Air Toxic (MSAT) Pollutants (tons/year)									
Pollutant	2020			2030			2040		
	50 mph Condition Without Project	No-Build	% Difference	50 mph Condition Without Project	No-Build	% Difference	50 mph Condition Without Project	No-Build	% Difference
Acrolein	0.00879	0.00735	-16.4%	0.00489	0.00405	-17.2%	0.00248	0.00206	-16.9%
Benzene	0.08597	0.06987	-18.7%	0.04123	0.03314	-19.6%	0.02983	0.02415	-19.0%
1,3 Butadiene	0.00704	0.00584	-17.0%	0.00163	0.00134	-17.8%	0.00016	0.00014	-12.5%
Diesel PM	0.65903	0.55498	-15.8%	0.23277	0.19281	-17.2%	0.09556	0.07899	-17.3%
Formaldehyde	0.13642	0.11391	-16.5%	0.08365	0.06919	-17.3%	0.05543	0.04605	-16.9%
Napthalene	0.01450	0.01208	-16.7%	0.00801	0.00661	-17.4%	0.00453	0.00375	-17.2%

Exhibit 4.7.9-3 presents the results of the microscale analysis for particulate matter smaller than or equal to 10 microns (PM_{10}) for the 50 mph conditions without the project. For comparison purposes, the results for the No-Build Alternative, which accounts for the speed limit change, are included. The Parkside Avenue and Scajaquada Expressway intersection was selected for this analysis.

Exhibit 4.7.9-3 Microscale Predicted Particulate Matter Concentrations

Pollutant	2020		
	50 mph Condition Without Project	No-Build	% Difference
Predicted 24-hour PM_{10} Maximum Total Concentration ($\mu g/m^3$)	56.9	54.2	*-4.7%*
Predicted 24-hour $PM_{2.5}$ Maximum Total Concentration ($\mu g/m^3$)	22.0	22.0	0.0%
Predicted Annual $PM_{2.5}$ Maximum Total Concentration ($\mu g/m^3$)	8.8	8.9	+1.1%

Sections 4.2.1 and **4.7** describe future development trends in the study area. The reasonably foreseeable developments would be expected to have some effect on traffic in the study area; however, much of this was anticipated in the background growth rate used in the traffic models for the Build Alternative. Besides traffic growth, some of the growth from the colleges would include an increase in pedestrians and transit use.

Effects of the Build Alternative

As discussed in **Section 4.4.15**, an air quality analysis was conducted for the project. The analyses consisted of a mesoscale analysis for criteria pollutants and mobile source air toxics and a microscale analysis for particulate matter. **Exhibit 4.4.15-3, Exhibit 4.4.15-4, Exhibit 4.4.15-6, Exhibit 4.4.15-7 and Exhibit 4.4.15-8** present the results of the analyses.

As shown in **Exhibit 4.4.15-3**, in all analysis years (2020, 2030 and 2040), emission burdens of VOCs are slightly higher (by 0.1%) under the Build Alternative, when compared to that under No-Build. Emission burdens of NOx, CO, PM_{10} and $PM_{2.5}$ are slightly lower (by -0.1% to -2.2%) under the Build Alternative, when compared to that under the No-Build.

As shown in **Exhibit 4.4.15-4**, in all analysis years, mobile source air toxics are slightly lower (by -1.7% to -5.7%) under the Build Alternative, when compared to that under the No-Build.

As shown **Exhibit 4.7.9-4,** the predicted maximum concentrations of 24-hour PM_{10}, 24-hour $PM_{2.5}$ and annual $PM_{2.5}$ are lower under the Build Alternative as compared to that under the No-Build. The Parkside Avenue and Scajaquada Expressway intersection was selected for this analysis. The result of this analysis showed that no exceedances of the NAAQS are predicted under either alternative.

Exhibit 4.7.9-4 – Microscale Predicted Particulate Matter Concentrations

Pollutant	NAAQS		2020		
			No-Build Alternative	Build Alternative	% Difference
Predicted 24-hour PM_{10} Maximum Total Concentration ($\mu g/m^3$)	Primary and Secondary	150	54.2	52.9	-2.4%
Predicted 24-hour $PM_{2.5}$ Maximum Total Concentration ($\mu g/m^3$)	Primary and Secondary	35	22	21.8	-0.9%
Predicted Annual $PM_{2.5}$ Maximum Total Concentration ($\mu g/m^3$)	Primary	12	8.9	8.8	-1.1%
	Secondary	15			

Cumulative Effects

As stated above, the Build Alternative would result in no exceedance of the particulate matter NAAQS; lower predicted maximum concentrations of 24-hour PM_{10}, 24-hour $PM_{2.5}$ and annual $PM_{2.5}$ compared to that under the No-Build Alternative; lower mesoscale emissions for NOx, CO, PM_{10} and $PM_{2.5}$ when compared to that under the No-Build Alternative; and only slightly higher (0.1%) emissions of VOCs when compared to that under the No-Build Alternative. Thus, no significant adverse cumulative effects related to air quality are anticipated as a result of the proposed action.

4.7.10 Energy and Greenhouse Gases

Effects from Past, Present and Reasonably Foreseeable Actions

As part of the energy and greenhouse gas analysis for the project, for the purpose of evaluating cumulative effects associated with the speed limit change from 50 mph to 30 mph (which was implemented independent from the current action), the 50 mph conditions without the proposed project were assessed (see **Appendix B9**). The analysis of the 50 mph conditions used traffic data that had been developed prior to the speed limit change.

Exhibit 4.7.10-1 presents the results of the analysis for the 50 mph conditions without the project. For comparison purposes, the results for the No-Build Alternative, which accounts for the speed limit change, are included. **Exhibit 4.7.10-1** shows that the total direct energy consumption is lower by approximately 12.8% to 12.5% for all of the analysis years (2020, 2030 and 2040) under the No-Build Alternative as compared to the 50 mph conditions without the proposed project. The No-Build Alternative also has lower direct CO_2e emissions by 12.3% to 12.1%.

Exhibit 4.7.10-1 Direct Energy Consumption and Greenhouse Gas Emissions									
Pollutant	2020			2030			2040		
	50 mph Condition Without Project	No-Build	% Difference	50 mph Condition Without Project	No-Build	% Difference	50 mph Condition Without Project	No-Build	% Difference
Total Energy Consumption (million BTU)	461,086	402,229	-12.8%	385,889	337,642	-12.5%	366,287	320,603	-12.5%
CO_2e Emissions (Tons per Year)	39,880	34,987	-12.3%	33,644	29,555	-12.2%	32,100	28,226	-12.1%

Sections 4.2.1 and **4.7** describe future development trends in the study area. The reasonably foreseeable developments would be expected to have some effect on traffic in the study area; however, much of this was anticipated in the background growth rate used in the traffic models for the Build Alternative. Besides traffic growth, some of the growth from the colleges would include an increase in pedestrians and transit use.

Effects of the Build Alternative
As described in **Section 4.4.16**, the Build Alternative would improve operating efficiency within the study area, thereby reducing the direct energy and greenhouse gas emissions. The indirect energy used in the construction, when added to the direct energy, would result in a higher total energy used by 1% to 2% for the Build Alternative compared to that under the No-Build Alternative.

Cumulative Effects
As stated above, the Build Alternative would improve operating efficiency within the study area, thereby reducing the direct energy and greenhouse gas emissions. Significant adverse cumulative effects related to energy consumption and greenhouse gas emissions are not anticipated as a result of the proposed action.

4.7.11 Noise

Effects from Past, Present and Reasonably Foreseeable Actions
Existing traffic noise levels were modeled as part of the noise analysis for the project. As described in **Section 4.4.17**, six of the 20 analysis areas have existing traffic noise levels that exceed 67 dB(A), which is the Noise Abatement Criteria specified in FHWA noise regulations (23 CFR 772) and NYSDOT Noise Policy.

Sections 4.2.1 and **4.7** describe future development trends in the study area. The reasonably foreseeable developments would be expected to have some effect on traffic in the study area; however, much of this was anticipated in the background growth rate used in the traffic models for the Build Alternative. Besides traffic growth, some of the growth from the colleges would include an increase in pedestrians and transit use.

Direct Impacts
As discussed in **Section 4.4.17**, the noise analysis conducted for the project predicted that noise impacts, as defined in FHWA noise regulations and NYSDOT Noise Policy, would occur at six of the 20 analysis sites. However, within the impacted analysis sites, traffic noise levels under the Build Alternative would either be higher by 1 dB(A), lower, or the same as existing conditions. According to the FHWA's "Highway Traffic Noise: Analysis and Abatement Guidance," 3 dB(A) increases are barely perceptible by the human ear. Thus, no perceptible change in traffic noise levels is anticipated under the Build Alternative.

Cumulative Effects
As stated above no perceptible change in traffic noise levels is anticipated under the Build Alternative. No significant adverse cumulative effects are anticipated as a result of the proposed action.

Exhibit 4.7-1 Summary of Cumulative Effects	
Resource Affected	**Cumulative Effects**
Social	New and enhanced connections to and between existing neighborhoods; within Delaware Park; between Delaware Park and adjacent neighborhoods; and to future residential, institutional and commercial areas.
Economic	More opportunities for tourism and economic growth in the study area.
Surface Waters	No significant adverse cumulative effects to surface waters are anticipated as a result of the proposed action
Floodplains	No significant adverse cumulative effects to floodplains are anticipated as a result of the proposed action.
Ecology & Endangered Species	Impacts to the general ecology of the area would be minimal. Consultation under Section 7 of the ESA determined that the project "May Affect, but is Not Likely to Adversely Affect" the NLEB.
Cultural Resources	An MOA was developed for the project to resolve adverse effects on identified archaeological properties. No significant adverse cumulative effects related to cultural resources are anticipated as a result of the proposed action.
Parkland	The Build Alternative combined with BOPC's continued efforts toward implementation of their restoration plan would result in beneficial effects to parkland.
Visual Resources	An overall beneficial effect on visual resources in the study area.
Air Quality	No significant adverse cumulative effects related to air quality are anticipated as a result of the proposed action.
Energy and Greenhouse Gases	No significant adverse cumulative effects related to energy consumption and greenhouse gas emissions are anticipated as a result of the proposed action.
Noise	No significant adverse cumulative effects are anticipated as a result of the proposed action.

4.8 Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term effects on and uses by the environmental are those that would occur during the construction of the Build Alternative. Impacts that extend beyond the period of construction are considered to be long-term impacts.

In general, construction of the Build Alternative would include pavement reconstruction; milling and resurfacing; installation of curb and barrier, drainage, lighting and signing; landscaping; striping; shared-use path construction; sidewalk construction; footpath construction; parking area reconstruction; relocation of an affected statue; gateway features, and the removal of existing pavement and other features. Construction effects are discussed in **Section 4.5**.

Construction would involve temporary disruptions to the use of sections of parkland and other adjacent areas. Measures would be implemented to minimize adverse construction impacts, as described in **Section 4.5**; however, temporary traffic delays, noise, and dust would be experienced. These effects would be short-term in nature, variable, and localized, depending on the particular work being conducted and the time of the activity. Project construction would also require the movement of workers, equipment, and materials throughout the project area. Construction would, however, result in benefits to the local and regional economy. Employment opportunities would be made available to local workers. Local and regional businesses would respond to needs for goods and services.

Beneficial long-term effects from the Build Alternative would include a 16 percent reduction in impervious area and treatment of stormwater ranging from a 9 to 59 percent decrease in pollutant loadings to Scajaquada Creek (see **Section 4.4.8**). The Build Alternative would also result in 2.9 acres of additional parkland (see **Section 4.4.12**). The use of the park would be enhanced with additional shared-use paths within the parkland along NYS Route 198 and with additional shared-use crossings over NYS Route 198 and Scajaquada Creek. Motorists would benefit from safer transportation on NYS Route 198. Improved views would be experienced by those in and adjacent to NYS Route 198. With the increased connectivity for bicycles and pedestrians within and to the adjacent community, the Build Alternative would also enhance the growth fueled by the colleges in the surrounding area (see **Section 4.4.6**), improving sustainable development and smart growth practices, and also enhance the long term viability of Delaware Park as a key recreational and cultural destination within the City of Buffalo.

4.9 Irreversible and Irretrievable Commitments of Resources

Implementation of the Build Alternative would involve the commitment of a range of natural, physical, human, and fiscal resources. As described in **Section 4.12**, the Build Alternative would require less land than the expressway that it replaces. However, the land required for construction of the project would be an irretrievable commitment of this resource.

Other irretrievable resources that would be committed for the Build Alternative include:

- Fossil fuels and materials used in construction
- Labor used in the fabrication and installation of the materials
- Energy used for the fabrication, transportation and installation of these materials (see **Section 4.4.16**).

The above listed resources are not in short supply and their use would not have an adverse effect upon their continued availability. Construction would also require a one-time expenditure of both State and Federal funds that is not retrievable.

The improved transportation system would require the commitment of these resources. Residents in the immediate area and region would benefit from the enhanced roadway safety, improved compatibility of the roadway with its surroundings (including enhanced bicycle and pedestrian facilities), and improved infrastructure that would be provided under the Build Alternative and the contribution of these benefits to the long term growth and vitality of the surrounding area. These benefits outweigh the commitment of resources.

4.10 Adverse Environmental Impacts that cannot be Avoided or Adequately Mitigated

Construction of the Build Alternative would remove up to approximately 974 trees. Efforts would be made during final design to avoid tree removals, especially those trees deemed to be important in consideration of their size, species, state of health and location.

After minimization of impacts at the preliminary design level, it would not be possible to avoid minor fill (approximately 0.04 acres) in Scajaquada Creek. Mitigation is not planned for this minor amount of fill as it would not be required under the anticipated Section 404, Nationwide Permit No. 14, “Linear Transportation Projects” (see **Section 4.4.2**).

A noise analysis concluded that noise impacts would occur at six receiver locations for the Build Alternative (see **Section 4.4.17**). An abatement analysis found that none of the noise abatement measures met the established criteria for feasibility and reasonableness. However, no receptor was predicted to experience a noise level increase greater than 2 dBA over the existing noise level, which is not anticipated to be perceptible.

4.11 References

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TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT / FINAL ENVIRONMENTAL IMPACT STATEMENT / FINAL 4(f) EVALUATION

CHAPTER 5
FINAL SECTION 4(f) EVALUATION

November 2017

PIN 5470.22
NYS Route 198 (Scajaquada Expressway) Corridor
Grant Street Interchange to Parkside Avenue Intersection
City of Buffalo
Erie County

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

ANDREW M. CUOMO
Governor

CATHY CALHOUN
Acting Commissioner

U.S. Department of Transportation
Federal Highway Administration

CHAPTER 5 – FINAL SECTION 4(F) EVALUATION

The requirements of Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (now 49 USC §303) apply only to agencies within the U.S. Department of Transportation (USDOT) such as the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) and prohibit the Secretary of Transportation from approving any program or project that requires the use of a Section 4(f) resource, unless there is no feasible and prudent alternative to the use of such land and all possible planning has been undertaken to minimize harm to the 4(f) resource. Although these requirements are now codified at 23 U.S.C. Section 138 and 49 U.S.C. Section 303, this subject remains commonly referred to as 4(f) because the requirements originated in Section 4(f) of the Department of Transportation Act of 1966. Section 4(f) requires that special effort be made to preserve the natural beauty of the countryside and public parks and recreation lands, wildlife and waterfowl refuges, and archaeological and historic sites (sites listed on or determined eligible for listing on the National Register of Historic Places [NRHP]) (collectively, "Section 4(f) resources").

The Safe, Accountable, Flexible Efficient Transportation Equality Act: A Legacy for Users (SAFETEA-LU) includes an amendment to the Section 4(f) requirements that allows the USDOT to determine that certain uses of Section 4(f) land will have no adverse effect on the protected resource. *De minimis* impacts on publicly owned parks are defined as those that do not "adversely affect the activities, features and attributes" that qualify the resource for protection under Section 4(f).

The Build Alternative would require the use of publically owned parkland that is listed on the National Register of Historic Places and other historic properties in the project area. This Draft Section 4(f) Evaluation has been prepared because this use cannot be avoided and the Build Alternative would have more than *de minimis* impacts on publicly owned parks and historic properties.

The project is also subject to Section 6(f) of the Land and Water Conservation Fund (LWCF) Act, which applies due to the proposed use of land from a park where LWCF funds have been used. Compliance with Section 6(f) is discussed in **Section 4.4.12** of this Final Design Report/Final Environmental Impact Statement (FDR/FEIS).

5.1. Need, Purpose and Objectives

As discussed in **Section 1.2**, the project is needed to:

- Improve the compatibility of the roadway with its surroundings;
- Maintain the critical transportation link between I-190 and NYS Route 33;
- Maintain local connectivity for all modes of travel;
- Correct geometric features that do not meet current design standards;
- Reduce the disparity between vehicular operating speeds, the posted speed limit, and the design speed;
- Address historically higher than statewide average accident rates, accident severity, and identifiable accident patterns; and
- Rehabilitate or replace the pavement, drainage system, and lighting.

The purpose of the project is to provide geometric and operational improvements to NYS Route 198 in its current location from the Grant Street interchange to the intersection of Parkside Avenue, including the segment through Delaware Park. These improvements will be made while maintaining local connectivity

and a critical transportation link between I-190 and NYS Route 33, and providing enhanced compatibility with adjacent land uses.

The following objectives have been established to further refine the project purpose:

- Address identified geometric and operational deficiencies along NYS Route 198 in a manner that promotes traffic calming and enhances safety for users;
- Accommodate vehicular, bicycle, and pedestrian travel modes within the project corridor;
- Improve connectivity between both sections of Delaware Park on either side of the roadway and between the park and adjacent neighborhoods;
- Enhance the compatibility of the roadway with the unique characteristics of Delaware Park and adjacent land uses while conserving the natural features of the site to the greatest extent possible; and
- Address identified infrastructure deficiencies, such as deteriorated pavement, antiquated and non-functioning drainage systems, and inefficient street lighting, within the project area.

A detailed discussion of the existing conditions and the project need is provided in **Chapter 2**.

5.2 Project Alternatives

To satisfy the project purpose and objectives, a reasonable alternative must provide geometric, infrastructure, and operational improvements while maintaining both local connectivity and a critical transportation link between I-190 and NYS Route 33. It must also make NYS Route 198 more compatible with adjacent land uses.

As discussed in **Section 3.1** of this FDR/FEIS, several alternatives were considered during the scoping process of this project and subsequently dismissed from further study. These are summarized below and discussed in more detail in the Scoping Document.

Alternative 1A: Expressway

Potential Alternative 1A: Expressway would involve the upgrade of elements of NYS Route 198 to meet current NYSDOT design standards for a non-interstate freeway to the greatest extent feasible and practical. This potential alternative was eliminated from further study because it would not meet the stated purpose of providing enhanced compatibility with adjacent land uses.

Alternative 3: Street

Potential Alternative 3: Street would transform the Scajaquada Expressway into a street with one travel lane in each direction, primarily along the existing alignment. This potential alternative would not meet the project purpose in that it would not provide sufficient capacity to maintain the critical transportation link between I-190 and NYS Route 33 and therefore was dismissed from further consideration.

Alternative 4: Removal

Potential Alternative 4: Removal would involve the removal of NYS Route 198 from Delaware Park between Elmwood Avenue and Parkside Avenue. This potential alternative was dismissed because it would result in substantial congestion, delay and potential air quality impacts on the adjacent local street system and would not meet the stated purpose of maintaining a critical transportation link between I-190 and NYS Route 33.

The Build Alternative was developed based on the project purpose, objectives, needs, and public input, which are discussed in **Chapter 3**.

No-Build Alternative

The No-Build Alternative assumes no improvements in the project area other than those planned by others or implemented as part of routine maintenance. Although the No-Build Alternative is not prudent and feasible and does not meet the project's purpose or objectives, NEPA requires that it be evaluated in the DEIS. The No-Build Alternative also serves as a baseline condition against which the potential benefits and impacts of the Build Alternative are evaluated. The roadway would remain incompatible with its surroundings, retain geometric features that do not meet current design standards, continue to impede bicycle and pedestrian travel within the corridor; continue to promote a disparity between vehicular operating speeds, the posted speed limit, and the design speed; fail to address undesirable accident rates and severities; and result in the continued deterioration of the existing pavement, drainage, and lighting systems.

Build Alternative

A single reasonable alternative was identified and developed for study in the DDR/DEIS. Consideration was given to different individual features (options) based on public comments, stakeholder input, coordination with multiple agencies, and engineering studies. Consideration was also given to comments received on the DDR/DEIS and input gathered at the public hearing.

The Build Alternative would transform NYS Route 198 from an urban expressway into an urban boulevard with two travel lanes in each direction between the Grant Street interchange and Parkside Avenue, in its current location. The Build Alternative would sign NYS Route 198 as a bicycle route and result in 5-foot wide shoulders that could be used along with the travel lanes by commuter bicyclists. Ramps at Grant Street, Elmwood Avenue, and Delaware Avenue would be replaced with connecting roadways. Intersections with traffic control (stop signs, signals, or roundabouts) would be constructed where each connecting roadway meets NYS Route 198. Parkside Avenue would remain a signalized intersection. As a whole, the Build Alternative would accommodate motor vehicles, bicyclists, and pedestrians. Documented deficiencies of the existing drainage system would be addressed by replacing much of the system. Driver expectation of the facility and its design would be aligned, enhancing overall safety. Additional and enhanced pedestrian and bicycle crossing opportunities would be created, at minimum, at Buffalo State College, Elmwood Avenue, between Iroquois Drive and Mirror Lake, at Delaware Avenue, and at Parkside Avenue.

Refer to **Chapter 3** for a detailed discussion of design elements of the Build Alternative.

5.3. Description of Section 4(f) Properties

Section 4(f) requires consideration of:

- Parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public
- Publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public to the extent that public access does not interfere with the primary purpose of the refuge
- Historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public.[1]

There are no wildlife and waterfowl refuges in the project area. For this project, only public parks, recreation areas and historic sites will be considered.

[1] FHWA Section 4(f) Policy Paper, p. 5

5.3.1 Public Parks and Recreation Areas

The existing NYS Route 198 Expressway runs through Delaware Park, which is a large publicly owned park under the jurisdiction of the City of Buffalo. **Section 4.4.12** provides a description of this park and includes a summary of the major features and facilities in the park. A discussion of the park boundary is also included in **Section 4.4.12**.

The Scajaquada Expressway was originally constructed in several stages (separate projects) during the 1950s. The easternmost section is located within Delaware Park and was constructed in 1952 under a contract identified as the "Humboldt Parkway Extension Arterial," which connected the City of Buffalo's Humboldt Parkway from its terminus at Parkside Avenue westward to Delaware Avenue. Right-of-way was not acquired from the City of Buffalo for this first section of highway through Delaware Park.

Subsequent contracts in 1958 and 1959 connected the "Humboldt Parkway Extension" project westward to I-190 and completed the facility that exists today as Scajaquada Expressway. The NYSDOT acquired highway right-of-way for the 1958 expansion of the Scajaquada Expressway through the adjacent portion of Delaware Park; however, NYSDOT did not acquire right-of-way for portions of the expressway previously constructed through the eastern portion of the park.

Thus, the eastern portion is located within an operational right-of-way maintained by NYSDOT on land that is owned by the City of Buffalo as Delaware Park while the western portion of the expressway in Delaware Park, beginning just west of the Delaware Avenue interchange and extending westward, lies on highway right-of-way owned by New York State (see **Exhibit 4.4.12-3** in **Appendix B1**). As part of the Build Alternative, formal highway boundaries will be established along NYS Route 198 from Delaware Avenue to Parkside Avenue where they have not previously existed. All property will be acquired in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended.

To the west of Delaware Park, from the 1976 boundary of Delaware Park, on the north side of the expressway, there is an area owned by the City of Buffalo that was established in 2001 as the Olmsted Parks and Parkways Local Preservation District (see **Exhibit 4.4.12-3** in **Appendix B1**). The Jesse Kregal Pathway is located in this area. This pathway is a 2.4-mile shared use path along the north side of Scajaquada Creek that connects Delaware Park with the Niagara River Greenway (known as the "Riverwalk" in the City of Buffalo). The City considers one of its major purposes and functions is to serve as a recreation area and it is considered a recreational resource under Section 4(f).

In order to establish operational right-of-way limits in areas where right-of-way was not officially acquired in 1952 from the City of Buffalo, the highway right-of-way boundary lines acquired under the 1958 contract and design standards at that time were evaluated. The typical dimensions and offsets from the 1958 project were then applied to the 1952 section of the highway in order to determine the operational right-of-way limits. Where applicable, consideration was given to constraining features within the park, such as tennis courts, a park road, and the City of Buffalo Park Maintenance Facility.

The right-of-way width to the west of the Delaware Avenue interchange (1958 contract) varies depending on location, but can be characterized by a typical width of 120 feet, or 60 feet from the roadway centerline on each side of the roadway. Features included within this right-of-way include curbs and pavement, center median, median barrier and guiderail, closed drainage system, bridges and overhead sign structures.

To establish the operational right-of-way limits for the eastern portion of the Scajaquada Expressway, assumed highway boundary lines 60 feet off the centerline were placed on each side of the expressway based on the typical (1958 contract) right-of-way width of 120 feet. The operational right-of-way width was reduced in areas to exclude adjacent features, including the Delaware Park Comfort Station, South Meadow Drive, the City of Buffalo Radio Tower, and the City of Buffalo Parks Maintenance Facility. As a result, the operational right-of-way limits generally fall between 52 and 60 feet from the centerline of the expressway, and 17 to 24 feet from the existing curb.

Operational right-of-way limits at the Delaware Avenue Interchange were created by setting a line 15 feet off the face of curb and then striking best-fit tangents to simulate the highway boundary lines at ramps, as established by the NYSDOT to the west of Delaware Avenue under the 1958 contract. Areas within on-off ramps that are not accessible to park users were considered to be within the operational right-of-way.

5.3.2 Historic Sites

Section 4(f) historic sites are identified through the consultation process established under Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulation, 36 CFR Part 800: *Protection of Historic Properties.* Buildings, structures, objects and architectural districts listed in, or determined eligible for listing in the National Register of Historic Places are considered Section 4(f) properties. The results of the Section 106 consultation process for the project is summarized in **Section 4.4.11**.

A series of cultural resource surveys was conducted for this project by the Department of Anthropology, State University of New York at Buffalo on behalf of the New York State Museum/New York State Education Department. Five survey reports were prepared from 2004 to 2014, which took into account various changes in project scope and design during this period. These studies are listed in **Section 4.4.11**. The "Finding Documentation" in **Appendix B6** provides a listing of identified National Register Eligible (NRE) and National Register Listed (NRL) buildings, structures, archaeological sites, districts, and objects within the APE for the Build Alternative, including qualifying characteristics.

Delaware Park is listed in the NRHP as a component of the Delaware Park-Front Park System, an element of the Olmsted Parks and Parkway Thematic Resources in the City of Buffalo, Erie County. The Scajaquada Expressway follows the roadbed of a former park drive along an east-west alignment through the park. The roadway of the Scajaquada Expressway (NYS Route 198) within Delaware Park is considered a non-contributing structure.

The Parkside East and Parkside West Historic Districts are listed in the NRHP as components of the Olmsted Parks and Parkways Thematic Resources. The Spirit of Womanhood Statue is individually eligible under the National Register Criterion C as the work of a master. The statue is located within Delaware Park, but it is not a contributing resource.

Archaeological sites are considered 4(f) properties if determined to be eligible for inclusion on the National Register of Historic Places (NRHP) and if FHWA, after consultation with the State Historic Preservation Officer (SHPO) and any involved Tribal Historic Preservation Officers (THPO), determines that the archaeological resource warrants preservation in place. The archaeological sites identified for the project were not identified as warranting preservation in place and thus, are not considered 4(f) properties.

5.4. Uses of Section 4(f) Properties

The Section 4(f) regulations define three types of "use" of Section 4(f) property (23 CFR Part 774.17):

(1) When land is permanently incorporated into a transportation facility;

(2) When there is a temporary occupancy of land that is adverse to the preservation purpose of Section 4(f);

(3) When there is a constructive use of a Section 4(f) property.

5.4.1 Permanent Incorporation

The permanent incorporation of land into a transportation facility occurs when land from a Section 4(f) property is purchased outright as transportation right-of-way, or when a project acquires the property interest that allows permanent access onto a property such as a permanent easement for maintenance. This permanent incorporation is considered a "use" of Section 4(f) property.

As shown in **Exhibit 4.4.12-4** in **Appendix B1**, under the Build Alternative, the right-of-way acquisition[2] from Delaware Park is proposed to be approximately 2.0 acres, and the right-of-way acquisition from the Olmsted Parks and Parkways Local Preservation District is proposed to be approximately 0.7 acres. This constitutes a "use" of a Section 4(f) property.[3] These acquisitions encompass park property immediately adjacent to the existing operational right-of-way and right-of-way needed to accommodate minor changes in alignment and to accommodate the proposed 5-foot wide shoulders and median.

With regard to the historic aspect of Delaware Park, in a letter dated August 30, 2016 (see **Appendix B6**), the SHPO stated that the submitted information was reviewed and the SHPO found that "the proposed activities, as presented, will not alter or diminish any of the character defining features or integrity associated with the National Register listing of these properties."[4]

Subsequent to the publication of the DDR/DEIS for the project, the NYSDOT amended the Finding Documentation to address additional design modifications based on a consideration of public comments (April 21, 2017, **Appendix B6**). Modifications to the center median treatments, crosswalks, bicycle and pedestrian network, Delaware Park entrance, and Agassiz Circle will improve connectivity with no increase in the overall project footprint, and no additional adverse effects to historic properties. This was submitted to the SHPO in an email dated April 21, 2017. In a reply email dated May 9, 2017, the SHPO concurred with the findings of the minor amendments to the project (see **Appendix B6)**.

5.4.2 Temporary Occupancy

Temporary occupancy results when Section 4(f) property, in whole or in part, is required for project construction-related activities. The property is not permanently incorporated into a transportation facility but the activity is considered to be adverse in terms of the preservation purpose of Section 4(f). Under the provisions of 23 CFR 774.13(d), a temporary occupancy does not constitute a Section 4(f) use if the following conditions are met: 1) The duration is less than the time needed for the project's construction, and there is no change in ownership of land; 2) The scope of work is minor, in that both the nature and magnitude of changes to the 4(f) property are minimal; 3) No permanent, adverse physical impacts are anticipated, and there will be no temporary or permanent interference with the protected activities, features, or attributes of the property; 4) The land is fully restored, and returned to a condition at least as good as that which existed prior to the project; and 5) The agreement of the official(s) with jurisdiction over the Section 4(f) property regarding the above conditions is documented. If one of more of these conditions is not met, there is a use of the Section 4(f) property, even though the duration of construction-related activities is temporary.

Exhibit 5.4.2-1 in **Appendix B-1** shows the temporary easements needed for construction within the Section 4(f) properties. There are minor easements shown for 23 Agassiz Circle (0.02 acres) and 17 Parkside Avenue (0.01 acres), which are within the Parkside East Historic District. These temporary easements would be required in order to reconstruct the existing sidewalk in front of each of these properties. The need for these temporary easements was determined after the Finding Documentation was submitted to the SHPO (see **Section 4.4.11** and **Appendix B6**). A letter dated November 1, 2016 documenting this update has been sent to the SHPO. By letter dated November 3, 2016, the SHPO

[2] This includes both right-of-way acquisition and permanent easements.

[3] In addition to this acquisition, approximately 12.8 acres would be acquired from the parkland that is part of the operational right-of-way, which is described in **Section 5.3.1**. Acquisition of the operational right-of-way would not constitute a change in "use" of a Section 4(f) resource. The use of the operational right-of-way is currently a transportation "use" and it would remain a transportation "use" following the acquisition.

[4] The letter from SHPO also noted that "the Parkside East Historic District (NR Listed) and the home at 23 Agassiz Circle (contributing to the Parkside East HD) are potentially impacted by this activity." Subsequent to the submission of potential impacts, it was determined that the earlier anticipated right-of-way acquisition at 23 Agassiz Circle would not be needed.

agreed that the proposed changes to the project, as outlined in the November 1st letter, "will not alter or impact any of our previous consultation of determinations for this undertaking."

The remaining temporary easements are within Delaware Park and the Olmsted Parks and Parkways Local Preservation District. As there would be temporary interference with these properties, these easements would not meet the third criterion above and would therefore be considered a use under Section 4(f).

Temporary easements covering approximately 11.2 acres would be needed for the Build Alternative in Delaware Park. These include those required for reconstruction of NYS Route 198 and for construction of new shared-use paths and footpaths within Delaware Park that would follow the alignment of historic park pathways to the greatest extent practical (see **Sections 3.3.2** and **4.4.12**). This construction would temporarily interfere with some recreational activities at the park and would not meet the third criterion above. This would therefore be considered a use under Section 4(f).

Temporary easements covering approximately 3.0 acres would be needed for the Build Alternative in the Olmsted Parks and Parkways Local Preservation District. These include those required for reconstruction of NYS Route 198; for construction of new connections to the Jesse Kregal Pathway and for reconstruction of some segments of the Jesse Kregal Pathway. Detours will be planned so that pathway users would still be able to traverse through the Olmsted Parks and Parkways Local Preservation District; however, this construction would still temporarily interfere with some recreational activities at the Olmsted Parks and Parkways Local Preservation District and would not meet the third criterion above. These temporary easements would therefore be considered a use under Section 4(f).

5.4.3 Constructive Use

A constructive use involves no physical use of the Section 4(f) property via permanent incorporation of land or a temporary occupancy of land into a transportation facility. According to 23 CFR Part 775.15, a constructive use occurs when the project's proximity impacts are so severe that the protected activities, features or attributes that qualify the property for protection under Section 4(f) are substantially impaired. This includes situations where the projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a property protected by Section 4(f).[5] It also includes situations where the proximity of the proposed project substantially impairs esthetic features or attributes of a property protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the property.[6]

As part of a noise analysis for the project, noise modeling of the project area was performed for 2016 existing conditions and the project's design year (2040). Computed noise levels have been documented in the Noise Analysis Report (see **Appendix B10**). In accordance with 23 CFR 772 and the NYSDOT Noise Policy, the following two criteria are used to determine if noise impacts would occur:

(i) The predicted future traffic noise levels exceed existing levels by 6 dBA or more;

(ii) The predicted future traffic noise level approach, or exceeds the appropriate Noise Abatement Criteria (NAC). The NYSDOT has defined "approach" to be one decibel less than the NAC for a site. Activity Categories B (residential) and C[7] have a NAC of 67 dBA.

The modeling resulted in six receiver locations studied as having impacts based on the second criterion. Of these, two are located in Delaware Park, and two others are located near the Parkside East Historic

[5] 23 CFR Part 775.15(e)(1)

[6] 23 CFR Part 775.15(e)(2)

[7] Activity Category C includes 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, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.

District. Both of these areas are identified as Section 4(f) properties. **Exhibit 4.4.17-1** shows that the same noise levels were calculated for the existing conditions, for the No-Build Alternative and for the Build Alternative. The impacts would therefore not be attributable to the implementation of the Build Alternative. This would therefore not be a constructive use based on 23 CFR 774.15(f)(3).

The Section 106 Finding Documentation summarized in **Section 4.4.11** notes that identified historic properties subject to indirect visual effects consist of Delaware Park, Rockwell Hall at Buffalo State College, the Albright-Knox Art Gallery, the Buffalo History Museum, the Parkside Subdivision (West) Historic District, Forest Lawn Cemetery, the Parkside Subdivision (East) Historic District and residential buildings on Meadowview Place, Agassiz Circle and Humboldt Parkway. The visual effects to the setting or viewshed of these historic properties are associated with the following features of the Build Alternative:

- removal of existing expressway infrastructure and features within the NYS Route 198 corridor,
- the construction of a new pedestrian bridge over Scajaquada Creek and the Jesse Kregal path at the western end of Delaware Park, and
- construction on Iroquois Drive, NYS Route 198 and Parkside Avenue.

The Finding Documentation found that the visual effects associated with these changes would not alter contributing features of the setting or diminish the integrity of location, design, materials, or setting of identified historic properties. As a result of the Build Alternative, proposed changes associated with the NYS Route 198 corridor would result in positive visual impacts to historic properties adjacent to the Scajaquada Expressway Corridor.

As there would be no adverse effect on these properties under 36 CFR 800.5, there would be no constructive use to the same Section 4(f) property.

5.4.4 Conclusion

Exhibit 5.4.4 provides a summary of the use of identified Section 4(f) resources for the Build Alternative. The No-Build Alternative would not result in any use of 4(f) resources.

Exhibit 5.4.4
Summary of Section 4(f) Use under the Build Alternative

4(f) Resource	Section 4(f) Use	Description of Use
Delaware Park	Use	Permanent acquisition of 2.0 acres of parkland.
	Use	Temporary easement (11.2 acres)
Olmsted Parks and Parkways Local Preservation District, including the Jesse Kregal Pathway	Use	Permanent acquisition of 0.7 acres
	Use	Temporary easement (3.0 acres)
23 Agassiz Circle (contributing to Parkside East Historic District)	Use	Temporary easement (0.02 acres)
17 Parkside Avenue (contributing to Parkside East Historic District)	Use	Temporary easement (0.01 acres)

5.5. Avoidance Alternatives

If the use of Section 4(f) property is not *de minimis*, use of a Section 4(f) property may not be approved if a feasible and prudent avoidance alternative exists. Therefore, if any feasible and prudent avoidance alternative is available, it must be selected. An avoidance alternative is one that would not use any Section 4(f) property.

The regulations state that an alternative is not feasible if it cannot be built as a matter of sound engineering judgment (23 CFR 774.117). They also state that an alternative is not prudent if:

(i) It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;

(ii) It results in unacceptable safety or operational problems;

(iii) After reasonable mitigation, it still causes:

(A) Severe social, economic, or environmental impacts;

(B) Severe disruption to established communities;

(C) Severe disproportionate impacts to minority or low income populations; or

(D) Severe impacts to environmental resources protected under other Federal statutes;

(iv) It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;

(v) It causes other unique problems or unusual factors; or

(vi) It involves multiple factors in paragraphs (i) through (v) of this definition, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

NYS Route 198 Scajaquada Expressway was constructed through Delaware Park and parkland is present immediately adjacent to both sides of the roadway. Since parkland is present immediately adjacent to both sides of the roadway, shifting the alignment would not avoid the use of Delaware Park, a Section 4(f) resource, or use of any other 4(f) resources.

The **No-Build Alternative** would avoid the use of Section 4(f) properties; however, the No-Build Alternative is not a feasible and prudent avoidance alternative because it does not meet the Project's purpose and need and would result in continued unacceptable safety and operational problems.

Based on the information provided above, there are no feasible and prudent alternatives that would avoid the use of Section 4(f) property.

5.6 Alternative with Least Overall Harm

As set forth in the Section 4(f) regulations, if the analysis conducted concludes that there is no feasible and prudent avoidance alternative, then FHWA must approve, from among the remaining alternatives that use Section 4(f) property, the alternative that causes the least overall harm in light of the statute's preservation purpose.[8] The least overall harm is determined by balancing the following factors:

1. The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);

2. The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;

3. The relative significance of each Section 4(f) property;

[8] 23 CFR Part 774.3

4. The views of the official(s) with jurisdiction over each Section 4(f) property;

5. The degree to which each alternative meets the purpose and need for the project;

6. After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and

7. Substantial differences in costs among the alternatives.

Section 5.2 summarizes alternatives that were considered during the scoping phase of the project and were eliminated from further study. As stated in **Section 5.5**, above, while the No-Build Alternative would avoid the use of Section 4(f) properties, it is not a feasible and prudent avoidance alternative because it does not meet the Project's purpose and need. As such, there are no feasible and prudent alternatives that would avoid the use of Section 4(f) property. In the absence of an avoidance alternative, an evaluation of the remaining alternatives (i.e. the Build Alternative) was conducted with respect to the seven factors in the regulations and is as discussed below.

The Build Alternative would transform NYS Route 198 from an urban expressway into an urban boulevard with two travel lanes in each direction between the Grant Street interchange and Parkside Avenue, in its current location and one 5-foot shoulder in each direction from the vicinity of Buffalo State College to Humboldt Parkway. Refer to **Appendix A** for detailed plans, profiles, typical sections, and select cross-sections for the Build Alternative. Ramps at Grant Street, Elmwood Avenue, and Delaware Avenue would be replaced with connecting roadways. Intersections with traffic control (stop signs, signals, or roundabouts) would be constructed where each connecting roadway meets NYS Route 198. Parkside Avenue would remain a signalized intersection.

As a whole, the Build Alternative would accommodate motor vehicles, bicyclists, and pedestrians. The roadway design would conform to accepted standards for an urban arterial. Delays would be introduced at signalized intersections during rush hour in comparison to free flow conditions previously experienced along the expressway. Based on public input received to date, this would be acceptable in order to provide a facility that is more compatible with the park. Documented deficiencies of the existing drainage system would be addressed by replacing much of the system. Driver expectation of the facility and its design would be aligned, enhancing overall safety. Additional and enhanced pedestrian and bicycle crossing opportunities would be created, at minimum, at Buffalo State College, Elmwood Avenue, between Iroquois Drive and Mirror Lake, at Delaware Avenue, and at Parkside Avenue. One 5-foot shoulder in each direction would also be added.

<u>The ability to mitigate adverse impacts to each Section 4(f) property</u>
The Build Alternative has the ability to mitigate adverse impacts to Delaware Park and Olmsted Parks and Parkways Local Preservation District surrounding NYS Route 198 (see **Section 4.4.12**). The Build Alternative would add an estimated net amount of 4.4 acres to Delaware Park and 1.2 acres to Olmsted Parks and Parkways Local Preservation District from land currently in transportation use. The Build Alternative would include the construction of new shared-use paths and footpaths within Delaware Park that would follow the alignment of historic park pathways to the greatest extent practical (see **Sections 3.3.2** and **4.4.12**).

Exhibit 4.4.12-5 illustrates the existing pavement/hardscape areas within Delaware Park (11.8 acres) and the Olmsted Parks and Parkways Local Preservation District (3.3 acres). The proposed pavement/ hardscape area would be approximately 10.1 acres and 3.0 acres respectively. This would be a net decrease in pavement/hardscape area of 1.7 acres, or 14% less hardscape area within Delaware Park and 0.3 acres, or 9% less hardscape area in the Olmsted Parks and Parkways Local Preservation District. This would also help to lower the amount of pollutants entering into Hoyt Lake, Mirror Lake and Scajaquada Creek (see **Section 4.8**). Additional landscaping improvements would be incorporated that would enhance Delaware Park and in the Olmsted Parks and Parkways Local Preservation District.

The Build Alternative would have a beneficial effect for use of the Delaware Park and the Olmsted Parks and Parkways Local Preservation District by pedestrians and bicyclists (see **Section 3.3.2**). A combination of new and existing shared-use paths (10 feet wide) and footpaths (5 feet wide) would provide continuous accommodation along NYS Route 198 from Grant Street to Parkside Avenue. For Delaware Park, new pedestrian crossings of the NYS Route 198 would be added at Lincoln Parkway, Hoyt Lake, Delaware Avenue and at the Buffalo Parks Maintenance Facility. Highlights of some of these crossings and paths include:

- New shared-use paths and footpaths within Delaware Park would follow the alignment of historic park pathways to the greatest extent practical.

- A new segment of path, passing over Scajaquada Creek along with NYS Route 198 in the vicinity of Hoyt Lake and Mirror Lake, would improve the pedestrian experience within the Japanese Gardens by providing a bypass for other pedestrians and bicyclists.

- Pedestrians would have two new opportunities to cross Scajaquada Creek using the proposed shared-use path bridges.

At the Olmsted Parks and Parkways Local Preservation District, new pedestrian crossings would be added at Buffalo State College and Elmwood Avenue. These would provide a direct connection between the paths along NYS Route 198 and the Jesse Kregal Pathway.

The Build Alternative would mitigate adverse impacts to the Olmsted Parks and Parkways Local Preservation District with the construction of new connections to the Jesse Kregal Pathway and reconstruction of segments of the Jesse Kregal Pathway. Adverse impacts to both of these resources would also be mitigated through the addition of landscaping that would enhance the recreational use of the resources. The specifics of this landscaping would be developed during final design and in consultation with the Buffalo Olmsted Parks Conservancy. Landscaping and Enhancement include:

1. Install plantings along the roadside and in median areas wider than 6 feet.

2. Install Olmsted Parkway style lighting along NYS Route 198.

3. Construct gateway features at appropriate locations along the corridor.

4. Improve pedestrian access to the McMillan Monument.

5. Relocate the sculpture tilted “Spirit of Womanhood."

The Build Alternative would have beneficial effects the on the visual character of Delaware Park and the Olmsted Parks and Parkways Local Preservation District. This would result from the reduction of pavement areas; narrowed shoulders; the elimination of ramps, overhead highway sign structures, and overall elimination of many high-speed expressway infrastructure elements; and the introduction of a curbed landscaped center median and ornamental lighting throughout the length of the project area.

The Build Alternative would reconstruct the sidewalks in front of 23 Agassiz Circle and at 17 Parkside Avenue.

Relative Severity of the Remaining Harm, to the Section 4(f) Properties

The recreational features of Delaware Park and Olmsted Parks and Parkways Local Preservation District would be restored. The addition of mitigation as discussed above would also enhance the activities, attributes and features that quality these properties for protection under Section 4(f). The Build Alternative would reconstruct the sidewalks in front of 23 Agassiz Circle and at 17 Parkside Avenue.

Relative Significance of Each Section 4(f) Property

Delaware Park was designed by Frederick Law Olmsted, Sr., who was the designer of New York City's Central Park. It was known as Buffalo's own "Central Park" and is considered by the Buffalo Olmsted Parks Conservancy to be the centerpiece of the Buffalo Olmsted Park System. The Olmsted parks and Parkways Local Preservation District includes the Jesse Kregal Pathway, which connects Riverside to Parkside Avenue. The properties of 23 Agassiz Circle and 17 Parkside Avenue are both contributing to the Parkside East Historic District.

The Views of Official(s) with Jurisdiction Over Each Section 4(f) Property
As discussed in **Section 5.3.2** above, the City of Buffalo has jurisdiction over Delaware Park and Olmsted Parks and Parkways Local Preservation District. A letter was sent from FHWA to the City of Buffalo dated May 18, 2017, requesting a letter including the City's official view of the Build Alternative and the incorporation of appropriate measures to minimize harm. *No response has been received from the City of Buffalo to date.*

Delaware Park is listed on the National Register of Historic Places, and the SHPO also has jurisdiction over this Section 4(f) property. In a letter dated August 18, 2017, NYSDOT requested concurrence that "the Project will not adversely affect Delaware Park or 23 Agassiz Circle (a contributing resource to the Parkside East Historic District), both of which qualify for Section 4(f) protection." In a letter dated August 30, 2016 the SHPO concurred with a finding of no adverse effect on Delaware Park or 23 Agassiz Circle by stating "the proposed activities, as presented, will not alter or diminish any of the character defining features or integrity associated with the National Register listing of these properties" (see **Appendix B6**). As such, the activity will result in no direct or indirect impacts to these historic resources. "Subsequent to this, the need for temporary easements at 23 Agassiz Circle and at 17 Parkside Avenue was determined (see **Section 4.4.11** and **Appendix B6**). A letter, dated November 1, 2016 was sent to the SHPO documenting this update and stated that the proposed modifications to the Project would "cause no new adverse effects that were not previously identified as part of the Section 106 review for the Project." In a response dated November 3, 2016, the SHPO agreed that the proposed changes will not alter or impact any of the previous consultation of determinations for the undertaking (see **Appendix B6**).

Subsequent to the publication of the DDR/DEIS for the project, the NYSDOT amended the Finding Documentation to address additional design modifications based on a consideration of public comments (April 21, 2017, **Appendix B6**). Modifications to the center median treatments, crosswalks, bicycle and pedestrian network, Delaware Park entrance, and Agassiz Circle will improve connectivity with no increase in the overall project footprint, and added beneficial effects to parkland.

The Degree to Which Each Alternative Meets the Purpose and Need for the Project
The Build Alternative meets the purpose and need for the project. The other potential build alternatives were eliminated from further study because of their inability to adequately meet the purpose and objectives for the project.

After Reasonable Mitigation, the Magnitude of Any Adverse Impacts to Resources Not Protected by Section 4(f).
Besides impacts to resources protected by Section 4(f), the Build Alternative would result in minor impacts to surface waters (**Section 4.4.2**). The noise analysis for the Build Alternative (**Section 4.4.17**) predicted impacts at six receiver locations due to exceedances of the noise abatement criteria specified in 23 CFR 772; however, the same impacts were found in the existing conditions, so that these impacts would not be attributed to the Build Alternative. The visual impact analysis for the Build Alternative (**Section 4.4.13**) resulted in beneficial effects to the visual resources in the study area.

Substantial Differences in Costs Among the Alternatives.
The estimated construction cost for the Build Alternative is approximately $103.9 million.

Conclusion
The least harm analysis considered how the Build Alternative would require the use of Section 4(f) property. The Build Alternative is the only feasible and prudent alternative identified for the Project and would result in beneficial effects to the parks.

Exhibit 5.6
Summary of Section 4(f) Use and Impacts under the Build Alternative

4(f) Resource	Section 4(f) Use*	Historic Effects	Other Impacts
Delaware Park	Use	No Adverse Effect	• Add a net amount of 4.4 acres of parkland. • Decrease in pavement/hardscape area of 1.7 acres (14%). • Construction of new shared-use paths and footpaths that would follow the alignment of historic park pathways to the greatest extent practical. • New pedestrian crossings of the NYS Route 198. • Beneficial effects the on the visual character of the property
Olmsted Parks and Parkways Local Preservation District	Use	No Adverse Effect	• Add a net amount of 1.2 acres of parkland. • Decrease in pavement/hardscape area of 0.3 acres (9%). • New pedestrian crossings of NYS Route 198 and Scajaquada Creek. • New connections to the Jesse Kregal Pathway and reconstruction of segments of the Jesse Kregal Pathway. • Beneficial effects the on the visual character of the property.
Parkside East Historic District (23 Agassiz Circle)	Use	No Adverse Effect	None
Parkside East Historic District (17 Parkside Avenue)	Use	No Adverse Effect	None

*See **Exhibit 5.4.4**.

5.7. Measures to Minimize Harm

The Section 4(f) regulations require that the alternative selected must include all possible planning to minimize harm to Section 4(f) property.[9] All possible planning means that all reasonable measures identified in the Section 4(f) evaluation to minimize harm or mitigate for adverse impacts and effects must be included in the project. Overall, the Build Alternative was designed with objectives to benefit and enhance Delaware Park, the Olmsted Parks and Parkways Local Preservation District and the Parkside East Historic District. These include:

- Accommodate vehicular, bicycle, and pedestrian travel modes within the project corridor;
- Improve connectivity between both sections of Delaware Park on either side of the roadway and between the park and adjacent neighborhoods;
- Enhance the compatibility of the roadway with the unique characteristics of Delaware Park and adjacent land uses while conserving the natural features of the site to the greatest extent possible; and

[9] 23 CFR Part 774.3(c)(2)

In pursuing these objectives, measures to minimize harm to Section 4(f) resources have been developed for the Build Alternative, and include:

- In considering stormwater treatment areas (**Section 4.4.8**), hydrodynamic separators would be installed during Stages 1 and 3 to treat roadway runoff. They would be placed beneath the roadway or adjacent to the roadway, minimizing the need for additional right-of-way and impacts to the adjacent Delaware Park.

- Within the Delaware Park and the Olmsted Parks and Parkways Local Preservation District, **Exhibit 4.4.12-5** illustrates the existing pavement/hardscape areas within the Delaware Park as approximately 11.8 acres and within the Olmsted Parks and Parkways Local Preservation District as approximately 3.3 acres. The proposed pavement/hardscape area would be approximately 10.1 acres and 3.0 acres respectively. This would be a net decrease in pavement/hardscape area of 1.7 acres, or 14% less hardscape area within Delaware Park and 0.3 acres, or 9% less hardscape area in the Olmsted Parks and Parkways Local Preservation District.

- With the removal of hardscape area, the amount of greenspace in Delaware Park and the Olmsted Parks and Parkways Local Preservation District would be increased. This would also help to lower the amount of pollutants entering into Hoyt Lake, Mirror Lake and Scajaquada Creek.

- The travel lanes, shoulders and median were optimized to meet the project need and to minimize the use of Section 4(f) properties. The median widths for the Build Alternative were developed to minimize the amount of property impacting Delaware Park and the Olmsted Parks and Parkways Local Preservation District and still enhance the compatibility of the roadway with the unique characteristics of Delaware Park and the Olmsted Parks and Parkways Local Preservation District.

- The National Register Eligible “Spirit of Womanhood” statue would be moved from its current site due to the realignment of the roadway and construction of the new shared use paths. It would be placed in a nearby location that would allow improved access and visibility.

- There are features included in the Build Alternative that would support the goals of *The Olmsted City, The Buffalo Olmsted Park System: Plan for the 21st Century*. These goals include:

  - Convert the current “expressway” into an at-grade roadway with a lower posted speed limit
  - Retain the existing pedestrian bridge over NYS Route 198 located just east of Lincoln Parkway
  - Restore acreage from ramps to park use
  - Convert the National Register listed Lincoln Parkway Bridge to a pedestrian bridge
  - An Environmental Enhancement (see **Section 3.3.4.1**) to construct pathways in the park in their historic alignments
  - Reduce the amount of impervious surface area, which will improve the water quality in Scajaquada Creek (see **Section 4.4.8**)
  - Provide landscaping in the proposed median areas and along NYS Route 198

- Additional landscaping improvements would be incorporated in Delaware Park and in the Olmsted Parks and Parkways Local Preservation District.

- The Build Alternative would have a beneficial effect for use of the park by pedestrians and bicyclists. A combination of new and existing shared use paths (10 feet wide) and footpaths (5 feet wide) would provide continuous accommodation along NYS Route 198 from Grant Street to

Parkside Avenue. For Delaware Park, new pedestrian crossings of NY Route 198 would be added at Lincoln Parkway, Hoyt Lake, Delaware Avenue Park and at the Buffalo Parks Maintenance Facility providing new connectivity between both sides of the Delaware Park. At the Olmsted Parks and Parkways Local Preservation District, new crossings would be added at Buffalo State College and Elmwood Avenue (see **Section 5.6**).

- The design at the Parkside Avenue intersection minimized the need for property from the Parkside East Historic District to the need for temporary easements from 23 Agassiz Circle and 17 Parkside Avenue for the reconstruction of existing sidewalks in front of those properties.

5.8 Coordination

The Section 4(f) evaluation should be provided for coordination and comment to the official(s) with jurisdiction over the Section 4(f) resource and, in this situation, to the Department of the Interior (23 CFR Section 774.5). The officials with jurisdiction over historic properties is the SHPO, as well as the Advisory Council on Historic Preservation (ACHP) if they are participating in the Section 106 review for the project (23 CFR Section 774.17). For public parks, recreation areas, and wildlife and waterfowl refuges, the official(s) with jurisdiction are the official(s) of the agency that owns or administers the property and are empowered to present the agency on matters related to the property (23 CFR Section 774.17). The City of Buffalo owns Delaware Park and the Olmstead Parks and Parkways Local Preservation District.

The Department of the Interior, National Park Service (NPS) and the SHPO are both cooperating agencies and the City of Buffalo is a Participating Agency for the National Environmental Policy Act (NEPA) for this project as described in **Section 4.1.2.** Monthly coordination meetings have been available to cooperating agencies. An individual meeting was held with the NPS on March 14, 2016.

The SHPO has reviewed the Finding Documentation (**Section 4.4.11** and **Appendix B6**). A letter dated August 30, 2016 has been received from the SHPO with comments as part of the Section 4(f) review requirements (**Appendix B6**). The SHPO notes that "Delaware Park (NR listed), the Parkside East Historic District (NR Listed) and the home at 23 Agassiz Circle (contributing to the Parkside East HD) are potentially impacted by this activity." SHPO further states that the proposed activities, as presented, will not diminish any of the character defining features or integrity associated with the National Register listing of these properties. As such, the activity will result in no direct or indirect impacts to these historic resources." Additional coordination has occurred since publication of the Draft Design Report/Draft Environmental Impact Statement/Draft 4(f) Evaluation. Documentation of this coordination is provided in **Appendix B6**.

The City of Buffalo has been involved in a number of ways during project development. **Appendix G** provides a summary of public involvement efforts made for this project. The City of Buffalo has been involved in four meetings identified in **Appendix G**. The City of Buffalo has also served as a member of the stakeholder group for the project. Stakeholder meetings are also documented in **Appendix G**. The City of Buffalo has also been a Section 106 Consulting Party as documented in **Section 4.4.11**.

Section 4(f) regulations also require that a public notice opportunity for public review and comment concerning the effects on the protected activities, features or attributes of the property must be provided (23 CFR Part 774.5(b)(2)(i)). As allowed for in the regulation, this requirement is being satisfied in conjunction with other public involvement procedures, including the comment period provided for this Draft Design Report/Draft Environmental Impact Statement/Draft 4(f) Evaluation.

5.9 Conclusion

As discussed in this Draft Section 4(f) Evaluation, the Build Alternative would require the use of land from Delaware Park, Olmsted Parks and Parkways Local Preservation District and 23 Agassiz Circle and 17 Parkside Avenue. This evaluation has found that there is no feasible and prudent alternative that avoids the use of Section 4(f) properties. Also, the project incorporates all possible planning to minimize the harm that results from the use of those resources would result in beneficial effects to Delaware Park and the Olmsted Parks and Parkways Local Preservation District.