# CHAPTER 5
# TRANSPORTATION AND ENGINEERING CONSIDERATIONS

This chapter describes existing and proposed highway and roadway characteristics, including vehicular traffic volumes, speeds, and level of service, as well as non-motorized transportation (bicycle and pedestrian) accommodation. It summarizes the engineering features of the project alternatives.

## 5.1 INTRODUCTION

This chapter discusses the existing transportation conditions and deficiencies in the Project Area and how they are expected to change over time, both without and with implementation of the I-81 Viaduct Project alternatives. The chapter identifies the engineering standards used to identify deficiencies and develop the project alternatives, as well as the data, methods, and tools used to perform the planning and engineering analyses for the Project. Benefits and impacts to the transportation system also are discussed.

## 5.2 TRANSPORTATION PLANS AND LAND USE

### LOCAL PLANS FOR THE PROJECT AREA

Local and regional long-range plans have established goals for land use, economic development, and regional transportation networks and/or have identified I-81, particularly the I-81 viaduct, as an influential feature within Downtown Syracuse and adjacent neighborhoods. A number of planning studies and initiatives were considered in identifying deficiencies in the Project Area, as well as in the development of project alternatives, including:

- I-81 Corridor Study
- Long-Range Transportation Plan
- City of Syracuse Comprehensive Plan 2040
- ReZone Syracuse
- Central New York Regional Economic Development Corporation (CNYREDC) Five Year Strategic Plan: 2012-2016
- Vision CNY Regional Sustainability Plan

- Fast Forward Syracuse Campus Framework
- University Hill Transportation Plan
- Onondaga County Settlement Plan
- Onondaga County Sustainable Development Plan

In addition, a number of development projects are planned for the Project Area.

Details of local and regional long-range plans and planned developments in the Project Area are presented in **Section 6.2.1 Land Use**.

## TRANSPORTATION CORRIDOR

### Importance of the Project Route Segment

I-81 is a primary interstate freeway extending 850 miles from I-40 in Dandridge, Tennessee, to the Canadian border at Wellesley Island northwest of Alexandria Bay. This north-south corridor plays a key role in the regional, statewide, and national transportation system, serving various travel markets such as trade, intercity travelers, commuters, and tourists. As a vital link in Central New York, I-81 serves the cities of Binghamton, Syracuse, and Watertown.

In the Syracuse metropolitan area, I-81 is the primary north-south travel and commuter route, providing direct access from suburban communities to Downtown Syracuse and its hospitals, businesses, and universities. According to the Greater Syracuse Economic Growth Council, five of the region's 10 largest employers are located adjacent to I-81. In and near the City of Syracuse, I-81 connects with I-481, an auxiliary interstate route that bypasses the city to its east; I-690, an auxiliary interstate route that connects I-90 (The New York State Thruway) to I-481 through Downtown Syracuse; and I-90, a major east-west interstate route that traverses upstate New York. Due to the seamless connectivity with other interstate freeways, I-81 provides travelers with accessibility to a diverse array of destinations.

I-690 begins at Interchange 39 on I-90 in Van Buren and terminates at I-481 in DeWitt. It is a primary east-west travel and commuter route, providing direct access from suburban communities to Downtown Syracuse. Similar to the function of I-81, I-690 serves many employers, as well as retail and entertainment destinations in the Syracuse metropolitan area.

I-81 and I-690, in coordination with I-481 and the city's street network, provide an efficient system serving the vehicular transportation needs of the greater Syracuse area. Therefore, the efficient operation and adequate capacity of the interstate/arterial system is of critical importance in terms of providing an acceptable level of transportation service in the corridor. Furthermore, I-81 and I-690 have a considerable influence on the character and economic vitality of the city and region. Since the City of Syracuse is the region's largest economic center, the presence of I-81 and I-690 in Downtown Syracuse influences vehicular and pedestrian connectivity, land use development, goods movement, and regional travel patterns between neighborhoods and communities.

### Alternative Routes

Two basic trip-types travel on I-81 in the Project Area:

- Through trips – traffic that passes through the Syracuse region. These are trips that begin and end beyond I-81's northern and southern interchanges with I-481.
- Non-through trips – traffic with origins and/or destinations in the Syracuse region (including Downtown Syracuse, University Hill, Destiny USA, and the communities that surround the City of Syracuse).

For northbound and southbound I-81 through trips, I-481 also provides a direct connection between the northern and southern I-81/I-481 interchanges, and therefore would be suitable as an alternative route or a permanent detour. I-481 also is a potential route for trips currently using northbound I-81 to eastbound I-690, destined for Westcott, Eastwood, and East Syracuse. For pass-through trips currently using northbound I-81 to westbound I-690, there are less-suitable alternative routes on the existing roadway system due to lack of a bypass road around the west side of the city. State Route 173 (Onondaga Road) is a potential alternate route for northbound I-81 to westbound I-690 trips destined for Fairmount and Camillus. Route 173 can be accessed from I-81 at Interchange 16A.

For I-81 non-through trips, many southern parallel roadways into the downtown area are available for dispersing traffic, providing direct routes to key destinations. These local routes mostly are lower-speed facilities passing through residential areas, including Almond Street, Salina Street, State Street (US 11), and Cortland Avenue (State Route 175). In contrast, there are fewer northern parallel roadways to bring traffic directly to downtown.

I-690 is an east-west interstate highway extending approximately 14 miles from I-90 in Van Buren to I-481 in DeWitt. For eastbound and westbound I-690 through trips, I-90 (The New York State Thruway) is a suitable alternative route. However, I-90 is a tolled-facility, and as an alternative route, would require an additional cost. In addition, State Route 5 (Erie Boulevard) and State Route 92 (Genesee Street) are potential alternative routes for westbound I-690 non-through trips, and State Route 5 (Genesee Street/Erie Boulevard) is a potential alternative route for eastbound I-690 non-through trips.

### Corridor Deficiencies and Needs

The I-81 viaduct and I-81/I-690 interchange have been the subject of community and agency concern because of ongoing congestion and safety issues, as well as aging infrastructure. The *I-81 Corridor Study* (NYSDOT, July 2013) that preceded this Project identified a section of I-81 and I-690 in and near Downtown Syracuse as a priority area for improvements due to a concentration of structural and geometric deficiencies, as well as frequent congestion and high vehicle accident rates. In many instances, highway design features (such as shoulder widths, median widths, horizontal alignment, and interchange spacing) pre-date current design standards and, coupled with high traffic volumes, have led to recurring congestion and high accident rates. In addition, the highway infrastructure is nearing the end of its intended design life, and the viaduct and other highway bridges have deteriorated due to age, wear, and harsh winter weather conditions. The I-81 viaduct study (or priority) area exhibits a high concentration of traffic incidents and nonstandard and non-conforming features. Accident

rates typically are two to three times higher than the statewide average rate for similar facilities. Although highway infrastructure is maintained in a state-of-good repair to ensure its structural integrity remains safe for the traveling public, continued deterioration could lead to increased maintenance costs, weight and speed restrictions on bridges, and potentially, eventual closure of bridges.

A survey of the Project Area identified over 200 non-standard and nonconforming features along the Project Area (see **Table 5-21 and Table 5-22 in Section 5.3**). While not all features are equally critical to safe operations, this number indicates the extent of potential design-related safety issues in the Project Area.

Corridor needs include replacement of structurally deficient bridges, improvement of non-standard conditions, operational improvements, and enhancement of pedestrian and bicycle access. The Syracuse Transit System Analysis published in 2014 as part of the I-81 Challenge proposed many transit mobility and accessibility improvements along with other transportation Demand Management type improvements (e.g., guaranteed ride home, car-sharing, and carpool matching). At this time all the proposed improvements have yet to be implemented pending additional study and procurement of funding.

**Transportation Plans**

The preliminary design and Right-of-Way (ROW) incidental phase of this project is on the approved Transportation Improvement Program (TIP) as Project No. 350160. When design advances, ROW acquisition and construction phases are not currently on the TIP.

**Abutting Highway Segments and Future Plans for Abutting Highway Segments**

There are no plans to reconstruct or widen the I-81, I-481 or the I-690 highway segment to the west, or the adjoining segments, within the next 10 years.

- **Adjoining segment of I-690 to the east** - This project, Project Identification Number (PIN) 3506.41, extends from Lodi Street to Peat Street and involves the reconstruction of I-690 and the replacement of two deficient bridges. Construction is expected to begin in 2017.
- **Third lane of Frontage Road** - NYSDOT has a proposed project that begins at Exit 23B at the on-ramp from Carousel Center Drive to the I-81 Southbound Frontage Road (SR 936F). The project includes adding a third southbound travel lane to Bear Street. Traffic from the ramp will default into this lane upon reaching the service road (the ramp is currently controlled by a yield sign and has no acceleration lane). The intersection with Bear Street will be reconfigured by virtue of the elimination of the existing slip ramp from the Frontage Road southbound to Bear Street westbound (programmed for 2020).
- **South Salina Street** - The City of Syracuse has a proposed project that will re-configure S. Salina Street to provide two lanes between Dorwin Avenue and Water Street, with one three-lane section (two northbound lanes and one southbound lane) between Onondaga Street and Warren Street. The schedule for construction has not been established.
- **Erie Boulevard** - The City of Syracuse has a proposed project that will re-configure Erie Boulevard to a three-lane section between Clinton Street and W. Genesee Street.

Preliminarily, the intent is to convert the center median area to a two-way center turn lane, but may also include on-street bike lanes. The schedule for construction has not been established.

- **Water Street** - The City of Syracuse has a proposed project that will close a portion of Water Street between University Avenue and Walnut Avenue. The schedule for construction has not been established.
- **James Street** - The City of Syracuse has a proposed project that will re-configure James Street to a three-lane section between State Street and Grant Street/Shotwell Street. The schedule for construction has not been established.
- **Two Way Conversion** - The City of Syracuse has a proposed project that will convert several one-way streets to two-way streets. The city streets planned for conversion include:
  - Clinton Street – Herald Place to Adams Street.
  - Warren Street – Willow Street to Washington Street.
  - Montgomery Street – Erie Boulevard to Adams Street.
  - Jefferson Street – Montgomery Street to State Street

## 5.3 TRANSPORTATION CONDITIONS, DEFICIENCIES AND ENGINEERING CONSIDERATIONS

### OPERATIONS (TRAFFIC AND SAFETY) & MAINTENANCE

#### Functional Classification

Functional classification is a method by which streets and highways can be categorized according to the character of traffic service that they are intended to provide. There are three basic highway functional classifications: arterial, collector, and local roads, which are then further divided into Interstate, Freeway, Principal, Major, Minor and Local. All streets and highways are grouped into one of the Functional Classifications depending on the character of the traffic and the degree of land access that they allow. For example, Arterials provide a high level of mobility and a greater degree of access control, while local facilities provide a high level of access to adjacent properties but a low level of mobility. Collector roadways provide a balance between mobility and land access. The following table provides the Functional Classification for all highways and streets within the Project Area (see **Table 5-1**).

#### Control of Access

Access to I-81, I-690 and I-481 is fully controlled.

Access to other state, county and local roads is generally uncontrolled, although access control exists in the vicinity of the I-81 and I-690 on- and off-ramp intersections.

**Table 5-1**
**Existing Functional Classifications**

| Route(s) | Functional Classification | National Highway System (NHS) | Designated Truck Access Route | Qualifying Highway | Within 1 mile of a Qualifying Highway | Within the 16 ft. vertical clearance network |
|---|---|---|---|---|---|---|
| Interstate 81-south of I-481 & north of I-90 | Urban Principle Arterial-Interstate | Yes | No | Yes | Yes | Yes |
| Interstate 81-north of I-481 & south of I-90 | Urban Principle Arterial-Interstate | Yes | No | Yes | Yes | No (1) |
| Interstate 690 | Urban Principle Arterial-Interstate | Yes | No | Yes | Yes | No (2) |
| Interstate 481 | Urban Principle Arterial-Interstate | Yes | No | Yes | Yes | Yes |
| West Street | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| W. Genesee Street | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| Almond Street, Adams St. to Erie Blvd. | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| Almond Street, Burt St. to Adams St | Urban Local | No | No | No | Yes | No |
| Erie Boulevard East | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| Adams St., west of I-81 | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| Adams St., east of I-81 | Urban Minor Arterial | No | No | No | Yes | No |
| Harrison St., west of I-81 | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| Harrison St., east of I-81 | Urban Minor Arterial | No | No | No | Yes | No |
| E. Genesee St, east of Almond | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| E. Genesee St, west of Almond | Urban Local | No | No | No | Yes | No |
| Crouse Ave., Waverly Ave. to Genesee St. | Urban Major Collector | No | No | No | Yes | No |
| Crouse Ave., Genesee St. to Burnet Ave. | Urban Local | No | No | No | Yes | No |
| Irving Ave., Van Buren St. to Genesee St. | Urban Minor Arterial | No | No | No | Yes | No |
| Irving Ave, Genesee St. to Fayette St. | Urban Local | No | No | No | Yes | No |
| Burt St., west of Almond St | Urban Minor Arterial | No | No | No | Yes | No |
| Renwick Ave., MLK. Jr., East to Burt St. | Urban Minor Arterial | No | No | No | Yes | No |
| Van Buren St. Renwick Ave. to Irving Ave. | Urban Minor Arterial | No | No | No | Yes | No |
| Fineview Place | Urban Local | No | No | No | Yes | No |
| Oswego Boulevard | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| James Street | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| Pearl St., E. Willow St. to I-81 ramp | Urban Principal Arterial-Other | Yes | No | No | Yes | No |

**Table 5-1**
**Existing Functional Classifications**

| Route(s) | Functional Classification | National Highway System (NHS) | Designated Truck Access Route | Qualifying Highway | Within 1 mile of a Qualifying Highway | Within the 16 ft. vertical clearance network |
|---|---|---|---|---|---|---|
| Pearl St., I-81 ramp to North Salina Street | Urban Minor Arterial | No | No | No | Yes | No |
| North Clinton Street, north of Genant Drive | Urban Local | No | No | No | Yes | No |
| North Clinton Street, South of Webster's Landing | Urban Minor Arterial | No | No | No | Yes | No |
| State Street, South of East Willow Street | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| Butternut Street | Urban Minor Arterial | No | No | No | Yes | No |
| Spencer Street | Urban Local | No | Yes (3) | No | Yes | No |
| Court Street | Urban Minor Arterial | No | Yes (4) | No | Yes | No |
| Bear Street West (NY 298), south of Sunset Avenue | Urban Principal Arterial-Other | Yes | Yes | No | Yes | No |
| Bear Street, north of Sunset Avenue | Urban Local Road | No | No | No | Yes | No |
| East Brighton Ave, South of I-481 | Urban Minor Arterial | No | No | No | Yes | No |
| East Brighton Ave, North of I-481 | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| East Willow Street, Pearl St. to North State St. | Urban Principal Arterial-Other | Yes | No | No | Yes | No |
| East Willow Street, Pearl St. to North Salina St. | Urban Local | No | No | No | Yes | No |
| North Salina Street | Urban Minor Arterial | No | No | No | Yes | No |
| MLK, Jr., East, S. State St. to Renwick Ave. | Urban Minor Arterial | No | No | No | Yes | No |
| Salt Street | Urban Local | No | No | No | Yes | No |
| Evans Street | Urban Local | No | No | No | Yes | No |
| Catherine Street | Urban Local | No | No | No | Yes | No |
| Webster's Landing | Urban Local | No | No | No | Yes | No |
| South Bay Road | Urban Minor Arterial | No | No | No | Yes | No |
| Genant Drive, Bear St. to Court St. | Urban Minor Arterial | No | Yes (5) | No | Yes | No |
| Genant Drive, Court St. to Franklin St. | Urban Local | No | Yes (5) | No | Yes | No |

**Notes:**
1) 16 ft clearance exemption, I-481 is the designated 16-foot clearance route.
2) I-90 is the designated 16-foot clearance route.
3) Spencer Street is only a Designated Truck Access Route from Van Rensselaer Street to Genant Drive.
4) Court Street is only a Designated Truck Access Route from Sunset Avenue to W. Kirkpatrick Street.
5) Genant Drive is only a Designated Truck Access Route from Bear Street to West Division Street.

**Sources:** Official Description of Designated Qualifying and Access Highway in New York State 04/2016, NYSDOT Online Functional Class Viewer

## Traffic Control Devices

*Traffic Signals*

Most intersections within the project area are signalized with three-color signals. For a complete list of all intersection control types, refer to **Appendix C-1**.

Traffic signals within the project area are owned and maintained by either NYSDOT or the City of Syracuse. The existing traffic signals comprise a combination of different types of hardware and equipment, which has been installed or upgraded at various times in the past. Traffic signal equipment within the project limits is in fair to good condition based on field inspection.

Most of the traffic signals within the project area are actuated and use inductance loop detection for phase activation combined with pedestrian push buttons with man/hand indications. Fixed time signals, and pedestrian countdown timers also are present in the project area. Signal are coordinated and interconnected by a centrally controlled traffic signal communication system.

*Signs*

Existing signs within the project area include, but are not limited to, parking, stop, street name, regulatory and warning signs, and their condition varies from poor to good condition based on field inspection. There are several intersections within the project area where minor cross streets or driveways are controlled by stop signs. For a complete list of all intersection control types, refer to **Appendix C-1.**

*Pavement Markings*

Throughout the project limits, double yellow lines separate two-way traffic, white lines and edge lines delineate auxiliary turn lanes, through lanes, shoulders, and on street parking. Pavement Markings are in fair to good condition.

## Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems are defined as the application of advanced sensor, computer, electronics and communication technologies and management strategies – in an integrated manner – to improve the safety and efficiency of the surface transportation system.

In conformance with FHWA Rule 940, a Regional Architecture was developed for the Syracuse Metropolitan Area (Onondaga County) and published in August 2002. This regional architecture follows the National Architecture to develop stakeholder expectations.

The National ITS Architecture describes the functions of an ITS system, the equipment required of a subsystem supporting those functions, and the data flow to tie the functions and physical equipment together. It provides a common organization to help transportation stakeholders plan and integrate their systems in a clear and efficient manner. The purpose of developing a regional ITS architecture is to illustrate and document regional integration so that planning and deployment can take place in an organized and coordinated fashion. Conformance with the National ITS Architecture is defined by development of a Regional Architecture and is required for agencies that use USDOT funding for ITS projects.

The regional architecture is concerned with defining the interaction of system elements, as well as defining the types of information to be exchanged between transportation related agencies and their respective transportation management systems, center-to-center connections, and added functionality of this regional integration. The Syracuse Metropolitan Area Regional Architecture has defined the NYSDOT Operations Center and field equipment to be relevant for 16 specific market packages including Broadcast Traveler Information, Emergency Response, Emergency Routing, Freeway Control, Incident Management System, Interactive Traveler Information, Regional Traffic Control, Road Weather Information System, Surface Street Control, and several others. Market packages include the physical equipment forming sub-systems required to provide the specified transportation service. The market packages listed for NYSDOT Region 3 entities were determined as those required to provide services relevant to NYSDOT.

NYSDOT Region 3 is not required to develop an additional Congestion Management Plan as the population size for Syracuse is still below 200,000.

**Existing Regional Inventory**

In support of the established market packages, NYSDOT Region 3 has installed permanent variable message signs (VMS), pan/tilt/zoom capable closed circuit TV cameras (CCTV), and acoustic-based vehicle detection sensors. **Figures 5-1, 5-2, 5-3 and 5-4** identify fixed ITS field equipment in the Project Area.

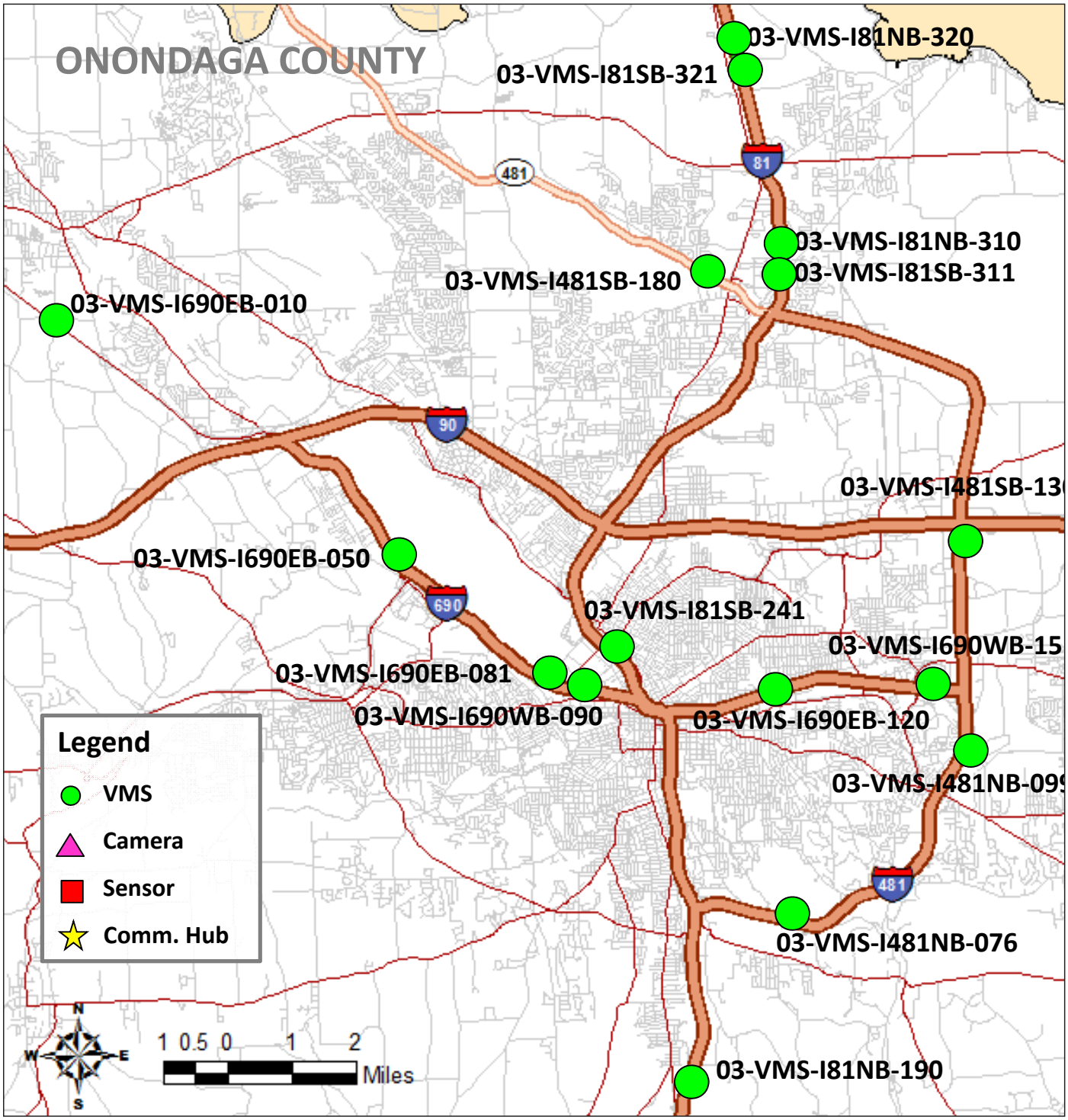
NYSDOT lists 51 additional portable VMS in inventory supporting various needs throughout the region including four (4) signs in support of the two (2) Overheight Detection Systems to monitor and warn overheight vehicles approaching the low-clearance rail bridge on SR-370, Onondaga Lake Parkway.

Each permanent field equipment site is powered by a local utility service drop. A state-owned and licensed radio system provides communications for the CCTV cameras and co-located acoustic sensors. The radio systems installed on I-81 and I-690 are Ethernet compatible. The radio systems installed on I-481 are not Ethernet compatible. The VMS signs use cellular modem service for low data usage serial communications.

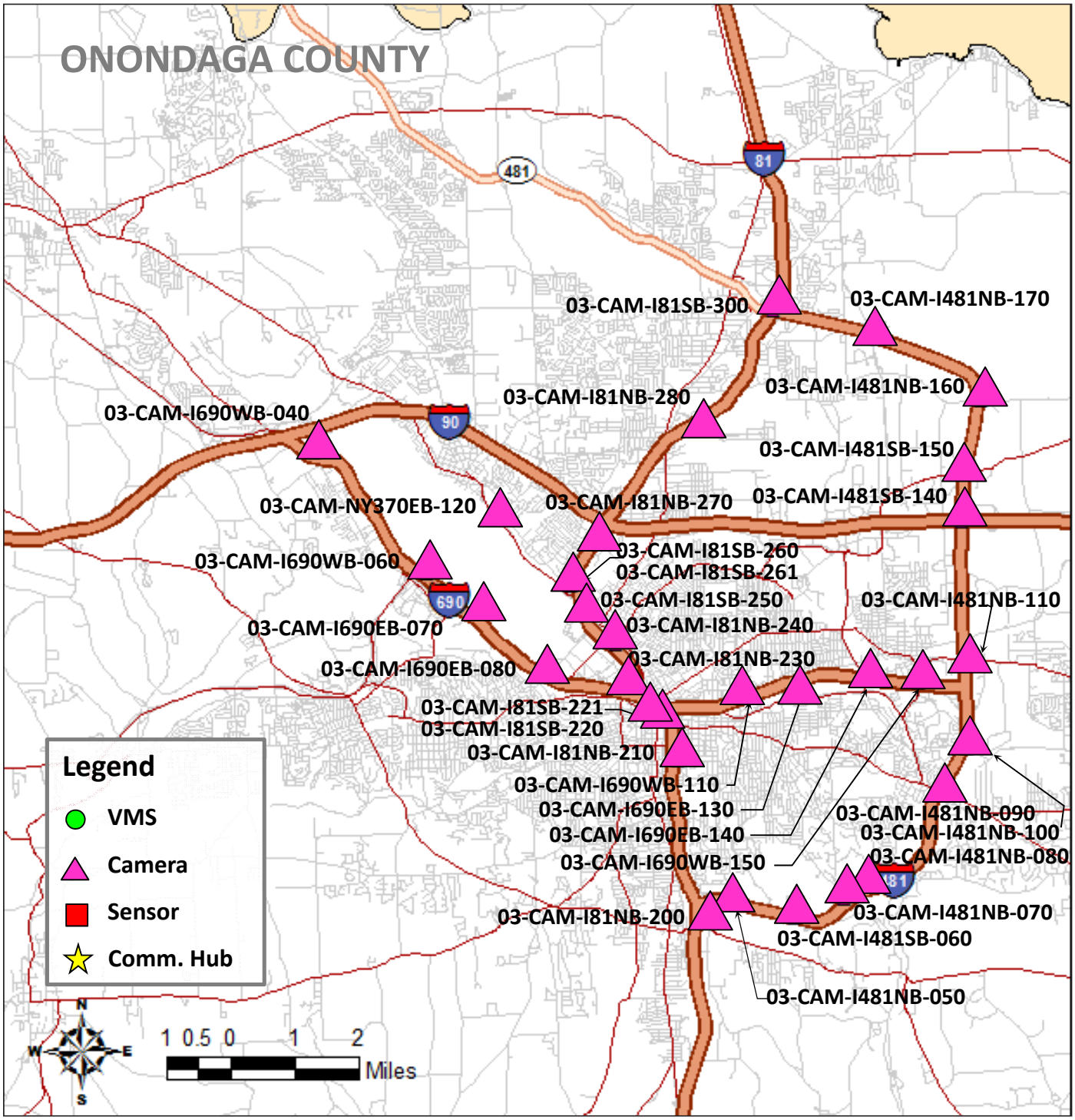
NYSDOT operates the Region 3 Traffic Management Center (TMC) located at the Syracuse State Office Building, 333 E. Washington Street. All CCTV cameras and VMS signs are monitored and controlled through the TMC. Vehicle sensors are generally configured to store historical data, while a limited map implementation uses the vehicle sensors along I-481 to allow the TMC to monitor congestion information along that corridor from I-81 to I-690.

Four ITS hubs aggregate the radio data communications from the field sites for further transmission to the TMC. These hub sites are located at:

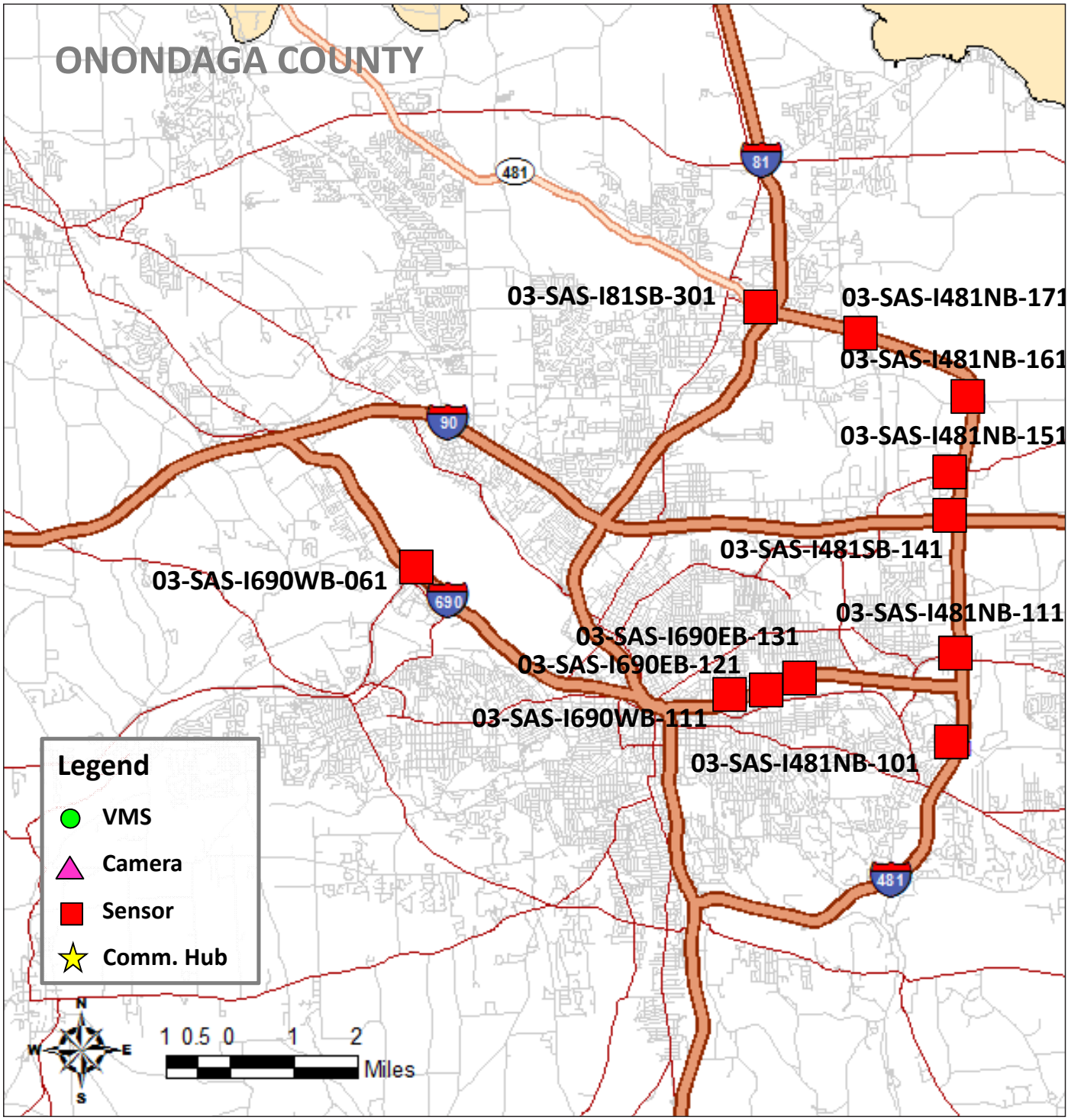
- Liverpool and I-81
- SR-695 and I-690
- Bridge Street and I-690
- South Bay Road (Back-up TMC)



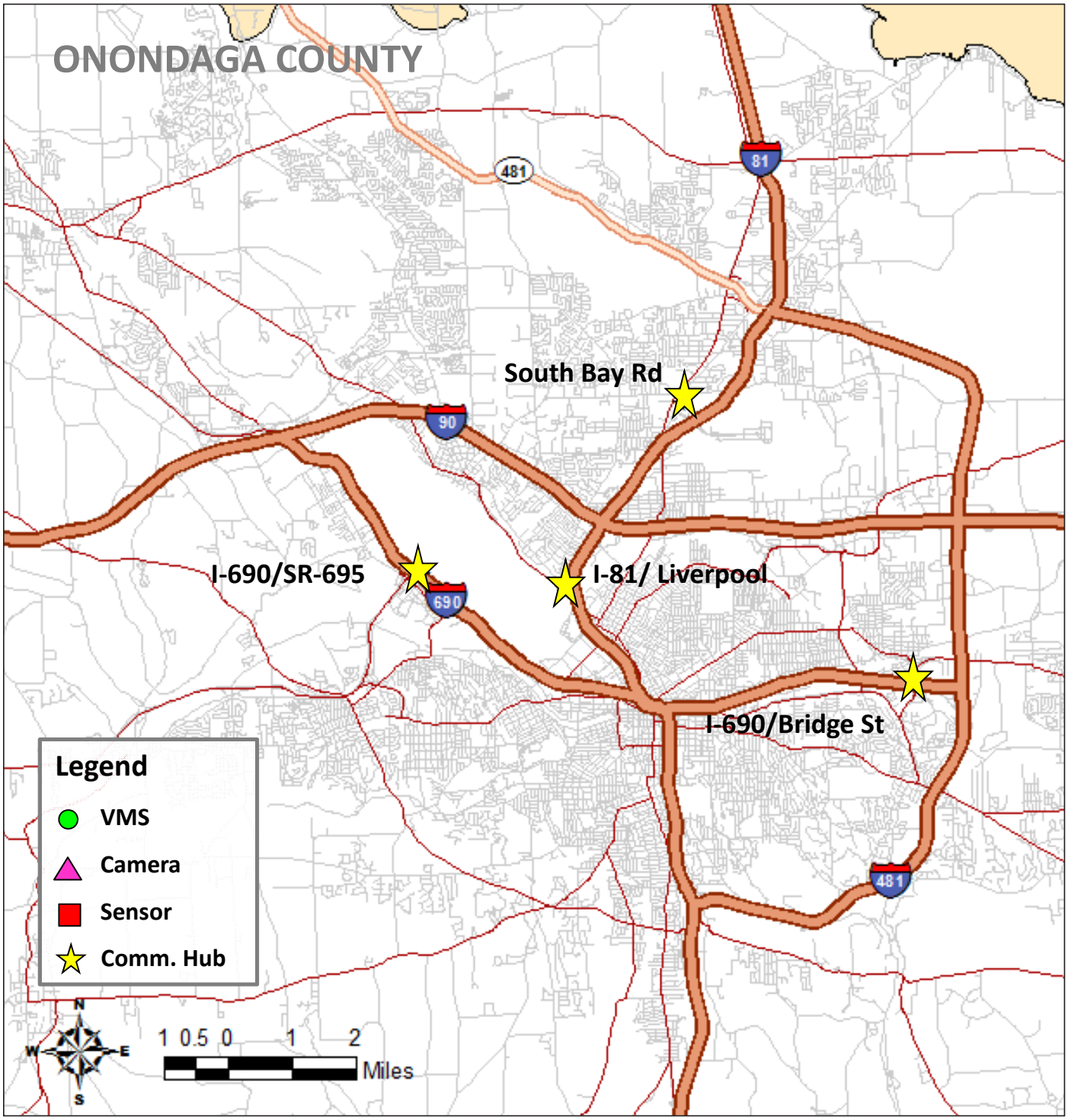

Variable Message Signs in Onondaga County




CCTV Cameras in Onondaga County




Vehicle Detection Sensors in Onondaga County




Communications Hubs in Onondaga County

The TMC communicates to other transportation stakeholders through various connections.

- A static VPN is provided to share video with the Rochester center.
- A Cisco AnyConnect VPN connection is used to share sign access with the Watertown center.

An Onondaga County-owned fiber connects the 911 Center to City Hall in Syracuse, and then the link is completed through Region-owned fiber to the TMC. The New York State Police, 911 Center, and the County Sheriff are the main information exchange stakeholders for incidents and events related to the Region 3 TMC

The inventoried equipment represents potential impacts to 15 CCTV cameras, six acoustic sensors, and six VMS signs installed along I-81 and I-690 or within interchanges connecting these two corridors to I-481.

Two of the four existing hubs, at Liverpool/I-81 and at SR-695/I-690, are within the Project Area.

Road Weather Information Systems (RWIS) were listed as a priority for the Region in development of the Regional Architecture. The geography of the Syracuse area promotes lake effect snowfall with annual totals exceeding 100 inches per year. Fog and ice are also hazards to the transportation in the Region. The current inventory notes that two RWIS sites remain in the area, but they have not been functional for several years.

TMC operators also report that wrong-way vehicles are an issue for the area. An anecdotal estimate is approximately three vehicles per month enter the NYSDOT controlled access facilities via an exit ramp and travel in the wrong direction. There is no particular point of entry (exit ramp) that appears to be a concentrated problem. There is no subsystem installed or planned for installation to address detection of wrong way vehicles.

Microwave radios for hub to TMC backhaul communications are 5MB and 20MB. However, distances limit the actual available bandwidth and would need to be improved for increased video resolution or other bandwidth support functions. There is no wire line support for communications between the TMC and field equipment in the current system.

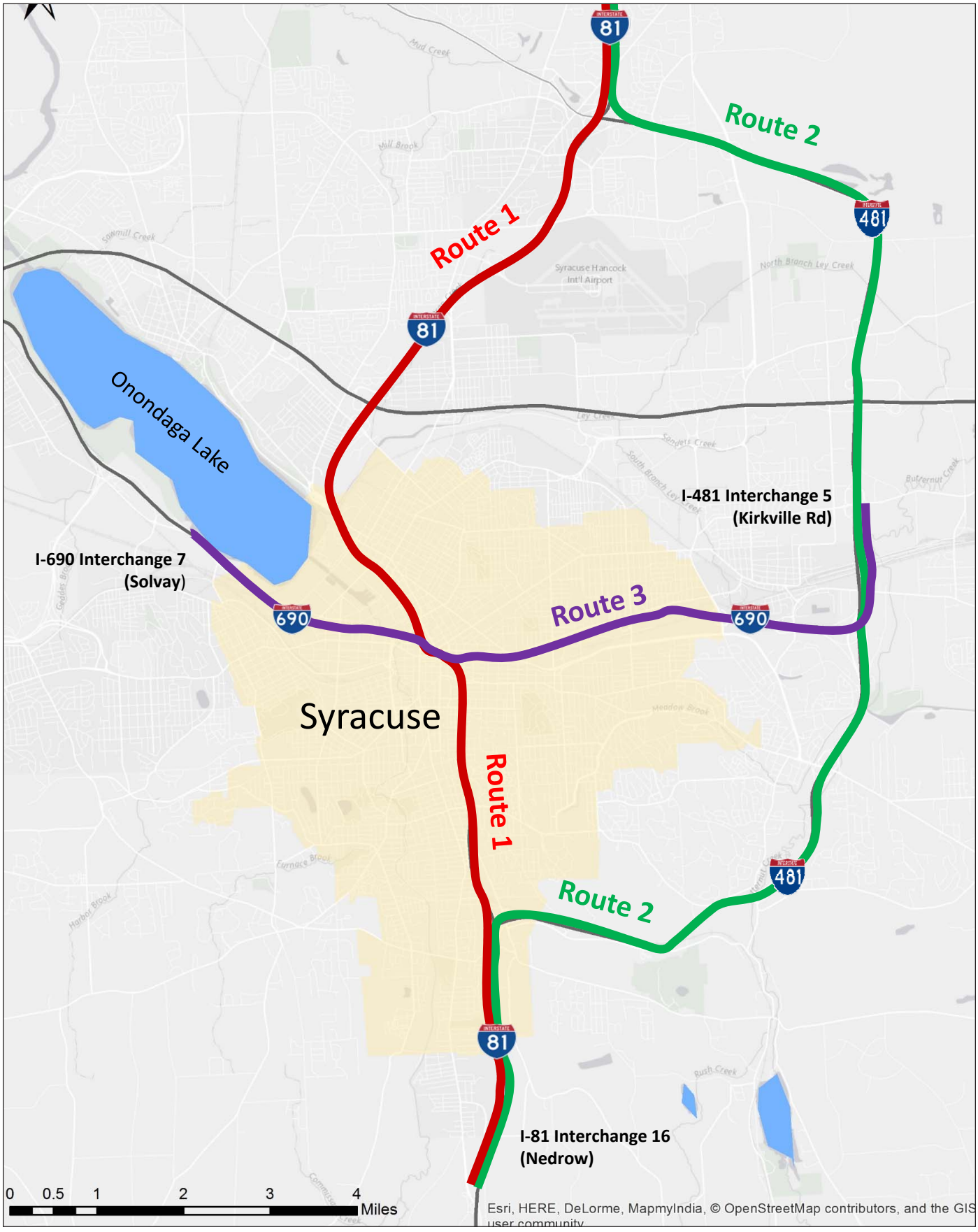
*No Build Alternative*

The No Build Alternative would include routine maintenance and repairs of the existing system.

### Speeds and Delay

*Existing Travel Time and Speeds*

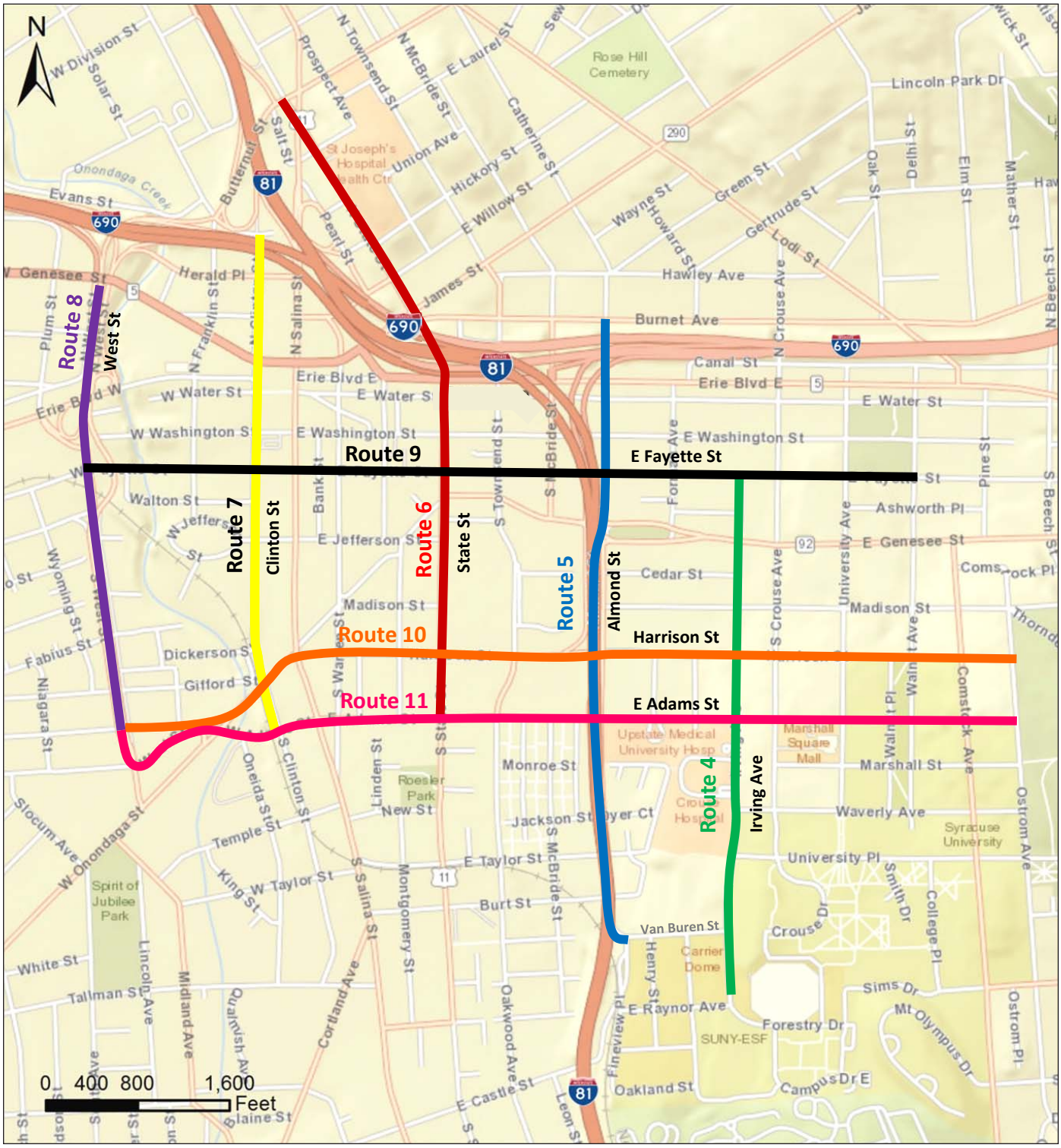
Field travel times and vehicular speeds were collected in December 2013 along 11 routes within the Project Area. Routes 1-3 (**see Figure 5-5**) represent freeway segments and Routes 4-11 represent arterial segments (**see Figure 5-6**). Data was collected using the average-car method, where a vehicle is driven along the route traveling with traffic at prevailing speeds while distance, travel time, and delay are recorded. Travel time and delay surveys were conducted during the AM (7:00 to 9:00 AM) and PM (4:00 to 6:00 PM) peak periods. **Table 5-**




Freeway Travel Time Routes

**I-81 Viaduct Project**

**Figure 5-5**




Arterial Travel Time Routes

**I-81 Viaduct Project**

**Figure 5-6**

**2** summarizes the average travel time, delay and speeds for each surveyed route by direction during the AM and PM peak periods.

**Table 5-2**
**2013 Existing Travel Time, Delay and Speeds**

| ID | Route | Direction | Travel Time (min) | | Travel Delay (min) | | Travel Speed (mph) | | Speed Limit |
|---|---|---|---|---|---|---|---|---|---|
| | | | AM | PM | AM | PM | AM | PM | (mph) |
| 1 | I-81 from Exit 17 to Exit 29N | NB | 13 | 14 | 2 | 3 | 55 | 52 | 45-65 |
| | | SB | 14 | 13 | 3 | 2 | 50 | 54 | 45-65 |
| 2 | I-481 from Exit 2 to Exit 8 | NB | 13 | 13 | 0 | 0 | 63 | 63 | 65 |
| | | SB | 13 | 13 | 0 | 0 | 63 | 63 | 65 |
| 3 | I-690 from Exit 8 to Exit 17 | EB | 10 | 9 | 2 | 1 | 50 | 51 | 45-55 |
| | | WB | 9 | 9 | 1 | 1 | 54 | 51 | 45-55 |
| 4 | Irving Avenue from Raynor Avenue to Fayette Street | NB | 4 | 4 | 3 | 2 | 12 | 14 | 30 |
| | | SB | 4 | 6 | 3 | 4 | 13 | 9 | 30 |
| 5 | Almond Street from Van Buren Street to Burnet Avenue | NB | 4 | 6 | 3 | 4 | 14 | 11 | 30 |
| | | SB | 6 | 5 | 4 | 4 | 11 | 12 | 30 |
| 6 | State Street from Adams Street to Butternut Street | NB | 6 | 7 | 4 | 5 | 12 | 10 | 30 |
| 7 | Clinton Street from Websters Landing to Adams Street | SB | 4 | 5 | 3 | 3 | 12 | 10 | 30 |
| 8 | West Street from Adams Street to Genesee Street | NB | 2 | 3 | 1 | 1 | 19 | 18 | 35 |
| | | SB | 2 | 1 | 0 | 0 | 25 | 31 | 35 |
| 9 | Fayette Street from Walnut Avenue to West Street | EB | 6 | 5 | 4 | 3 | 13 | 15 | 30 |
| | | WB | 6 | 6 | 4 | 5 | 12 | 12 | 30 |
| 10 | Harrison Street from Comstock Avenue to West Street | WB | 8 | 7 | 5 | 5 | 11 | 12 | 30 |
| 11 | Adams Street from West Street to Comstock Avenue | EB | 8 | 8 | 6 | 6 | 11 | 10 | 30 |

Average travel speeds on the arterials throughout the project area range from approximately 11 to 25 mph for the AM peak hour, and from 9 to 31 mph for the PM peak hour. For most arterial routes, the AM peak hour travel speeds are similar to the PM peak hour speeds. Except for Route 8 (West Street), all other arterial routes experience low speeds (i.e., equal to or less than 20 mph) during both the AM and PM peak hours. Route 11 (Adams Street) experiences the lowest travel speeds, ranging from 10 to 11 mph during the AM and PM peak hours. The route with the highest travel speed is Route 8 (West Street), ranging from 25 to 31 mph during the AM and PM peak hours. Low speed routes are typically caused by heavy traffic volumes and intersection (or traffic signal) delays.

Travel times for key origin-destination pairs in Onondaga County were estimated using output from VISSIM traffic simulations as well as the SMTC Regional Travel Demand Model. VISSIM is a microscopic, time-step and behavior-based model that analyzes multi-modal traffic flows with the flexibility of modeling all types of geometries and traffic control schemes. Details of the VISSIM model development are documented in the *VISSIM Development and Calibration Report* located in **Appendix C-2. Table 5-3** summarizes the average travel times for trips traveling between the key origin-destination pairs during the AM and PM peak periods.

**Table 5-3**
**Existing Origin-Destination Travel Times (Minutes)**

| Origin | Destination | AM | PM |
|---|---|---|---|
| Baldwinsville | Cicero | 22 | 23 |
| | Destiny USA | 23 | 20 |
| | Downtown | 22 | 20 |
| | Fairmount | 18 | 18 |
| | Fayetteville/Manlius | 32 | 31 |
| | LaFayette | 34 | 31 |
| | Liverpool | 15 | 15 |
| | St. Joseph's Hospital | 23 | 21 |
| | University Hill | 27 | 23 |
| Cicero | Baldwinsville | 21 | 23 |
| | Destiny USA | 12 | 12 |
| | Downtown | 16 | 14 |
| | Fairmount | 21 | 22 |
| | Fayetteville/Manlius | 19 | 19 |
| | LaFayette | 28 | 25 |
| | Liverpool | 13 | 14 |
| | St. Joseph's Hospital | 16 | 13 |
| | University Hill | 22 | 17 |
| Destiny USA | Baldwinsville | 22 | 24 |
| | Cicero | 11 | 12 |
| | Downtown | 8 | 8 |
| | Fairmount | 11 | 14 |
| | Fayetteville/Manlius | 19 | 19 |
| | LaFayette | 22 | 19 |
| | Liverpool | 8 | 9 |
| | St. Joseph's Hospital | 7 | 7 |
| | University Hill | 13 | 11 |
| Downtown | Baldwinsville | 20 | 21 |
| | Cicero | 15 | 16 |
| | Destiny USA | 5 | 6 |
| | Fairmount | 13 | 14 |
| | Fayetteville/Manlius | 15 | 18 |
| | LaFayette | 17 | 18 |
| | Liverpool | 9 | 10 |
| | St. Joseph's Hospital | 3 | 4 |
| | University Hill | 7 | 7 |

**Table 5-3**
**Existing Origin-Destination Travel Times (Minutes)**

| Origin | Destination | AM | PM |
|---|---|---|---|
| Fairmount | Baldwinsville | 17 | 18 |
| | Cicero | 23 | 23 |
| | Destiny USA | 13 | 13 |
| | Downtown | 14 | 12 |
| | Fayetteville/Manlius | 24 | 23 |
| | LaFayette | 26 | 23 |
| | Liverpool | 17 | 17 |
| | St. Joseph's Hospital | 15 | 12 |
| | University Hill | 19 | 15 |
| Fayetteville/ Manlius | Cicero | 27 | 29 |
| | Destiny USA | 17 | 17 |
| | Downtown | 13 | 13 |
| | Fairmount | 14 | 14 |
| | Fayetteville/Manlius | 20 | 22 |
| | LaFayette | 18 | 19 |
| | Liverpool | 17 | 18 |
| | St. Joseph's Hospital | 13 | 12 |
| | University Hill | 15 | 15 |
| LaFayette | Baldwinsville | 30 | 31 |
| | Destiny USA | 25 | 26 |
| | Downtown | 15 | 15 |
| | Fairmount | 17 | 16 |
| | Fayetteville/Manlius | 23 | 24 |
| | LaFayette | 18 | 18 |
| | Liverpool | 19 | 20 |
| | St. Joseph's Hospital | 17 | 18 |
| | University Hill | 15 | 15 |
| Liverpool | Baldwinsville | 13 | 15 |
| | Cicero | 14 | 15 |
| | Downtown | 6 | 7 |
| | Fairmount | 11 | 9 |
| | Fayetteville/Manlius | 16 | 17 |
| | LaFayette | 21 | 20 |
| | Liverpool | 24 | 20 |
| | St. Joseph's Hospital | 10 | 8 |
| | University Hill | 17 | 12 |
| St. Joseph's Hospital | Baldwinsville | 20 | 21 |
| | Cicero | 13 | 13 |
| | Destiny USA | 3 | 3 |
| | Fairmount | 3 | 3 |
| | Fayetteville/Manlius | 13 | 14 |
| | LaFayette | 14 | 16 |
| | Liverpool | 18 | 18 |
| | St. Joseph's Hospital | 7 | 8 |
| | University Hill | 7 | 7 |

**Table 5-3**
**Existing Origin-Destination Travel Times (Minutes)**

| Origin | Destination | AM | PM |
|---|---|---|---|
| University Hill | Baldwinsville | 21 | 22 |
| | Cicero | 16 | 17 |
| | Destiny USA | 7 | 7 |
| | Downtown | 7 | 7 |
| | Fayetteville/Manlius | 14 | 15 |
| | LaFayette | 15 | 17 |
| | Liverpool | 16 | 16 |
| | St. Joseph's Hospital | 10 | 11 |
| | University Hill | 7 | 6 |

### Future No Build Travel Time and Speeds

Travel time and travel speed projections for the 2020 and 2050 No Build conditions were developed using the VISSIM simulation software. VISSIM was used to compute the average travel time for all vehicles that traveled within a defined segment for a defined period. **Table 5-4** presents the estimated travel time, delay and speeds for each of the 11 travel routes by direction during the AM and PM peak hours. On most routes, 2020 No Build travel speeds would be slightly lower than the existing (2013) travel speeds and higher than 2050 No Build travel speeds.

In the AM peak hour, highway travel speeds throughout the project area would range from 46 to 63 mph and from 38 to 63 mph in 2020 and 2050, respectively. During the PM peak hour, highway travel speeds would range from 49 to 63 mph and from 50 to 63 mph in 2020 and 2050, respectively. Similarly, in the AM peak hour, arterial travel speeds throughout the project area would range from 9 to 21 mph and from 6 to 21 mph in 2020 and 2050, respectively. During the PM peak hour, arterial travel speeds would range from 8 to 20 mph and from 10 to 17 mph in 2020 and 2050, respectively. Similar to the 2013 existing conditions, under the 2020 and 2050 No Build conditions a vast majority of arterial routes can be characterized as low-speed routes, because their travel speeds would be less than 20 mph during one or more peak hours.

Travel times for key origin-destination pairs in Onondaga County were estimated using output from VISSIM traffic simulations, as well as the SMTC Regional Travel Demand Model. **Table 5-5** summarizes the average travel times for trips traveling between these origin-destination pairs during the AM and PM peak periods.

**Table 5-4**
**2020 and 2050 No Build Alternative Travel Time. Delay and Speeds**

| ID | Route | Direction | Travel Time (min) | | | | Travel Delay (min) | | | | Travel Speed (mph) | | | | Speed Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2020 | | 2050 | | 2020 | | 2050 | | 2020 | | 2050 | | |
| | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | (mph) |
| 1 | I-81 from Exit 17 to Exit 29N | NB | 13 | 14 | 13 | 14 | 2 | 3 | 2 | 3 | 55 | 53 | 54 | 53 | 55-65 |
| | | SB | 15 | 13 | 18 | 13 | 5 | 3 | 8 | 3 | 46 | 53 | 38 | 52 | 55-65 |
| 2 | I-481 from Exit 2 to Exit 8 | NB | 13 | 13 | 13 | 13 | 1 | 1 | 1 | 1 | 63 | 63 | 63 | 63 | 65 |
| | | SB | 13 | 13 | 13 | 14 | 1 | 1 | 1 | 2 | 63 | 63 | 63 | 63 | 65 |
| 3 | I-690 from Exit 8 to Exit 17 | EB | 9 | 9 | 9 | 9 | 1 | 1 | 1 | 1 | 52 | 52 | 51 | 53 | 45-55 |
| | | WB | 9 | 10 | 9 | 10 | 1 | 2 | 1 | 2 | 53 | 49 | 54 | 50 | 45-55 |
| 4 | Irving Avenue from Raynor Avenue to Fayette Street | NB | 4 | 4 | 5 | 4 | 3 | 3 | 3 | 2 | 11 | 12 | 10 | 13 | 30 |
| | | SB | 4 | 6 | 4 | 5 | 3 | 5 | 3 | 3 | 12 | 8 | 12 | 11 | 30 |
| 5 | Almond Street from Van Buren Street to Burnet Avenue | NB | 5 | 5 | 4 | 5 | 4 | 4 | 2 | 3 | 11 | 11 | 15 | 12 | 30 |
| | | SB | 7 | 6 | 11 | 6 | 6 | 4 | 9 | 5 | 9 | 11 | 6 | 11 | 30 |
| 6 | State Street from Adams Street to Butternut Street | NB | 5 | 8 | 6 | 7 | 3 | 6 | 4 | 5 | 12 | 8 | 12 | 10 | 30 |
| 7 | Clinton Street from Websters Landing to Adams Street | SB | 3 | 5 | 3 | 4 | 2 | 3 | 2 | 2 | 15 | 10 | 14 | 13 | 30 |
| 8 | West Street from Adams Street to Genesee Street | NB | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 20 | 20 | 21 | 17 | 35 |
| | | SB | 2 | 3 | 3 | 4 | 1 | 2 | 2 | 3 | 21 | 16 | 15 | 12 | 35 |
| 9 | Fayette Street from Walnut Avenue to West Street | EB | 6 | 6 | 6 | 6 | 3 | 4 | 4 | 4 | 14 | 12 | 13 | 12 | 30 |
| | | WB | 8 | 7 | 7 | 7 | 6 | 4 | 5 | 5 | 10 | 11 | 10 | 11 | 30 |
| 10 | Harrison Street from Comstock Avenue to West Street | WB | 7 | 7 | 7 | 9 | 5 | 5 | 5 | 6 | 12 | 12 | 12 | 10 | 30 |
| 11 | Adams Street from West Street to Comstock Avenue | EB | 8 | 8 | 8 | 8 | 6 | 6 | 5 | 5 | 11 | 11 | 11 | 12 | 30 |

**Table 5-5**
**No Build Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | 2050 | |
|---|---|---|---|---|---|
| **Origin** | **Destination** | **AM** | **PM** | **AM** | **PM** |
| Baldwinsville | Cicero | 22 | 23 | 23 | 23 |
| | Destiny USA | 23 | 20 | 23 | 21 |
| | Downtown | 22 | 21 | 22 | 21 |
| | Fairmount | 18 | 18 | 18 | 18 |
| | Fayetteville/Manlius | 31 | 31 | 31 | 31 |
| | LaFayette | 33 | 31 | 33 | 32 |
| | Liverpool | 15 | 15 | 15 | 16 |
| | St. Joseph's Hospital | 24 | 21 | 23 | 21 |
| | University Hill | 26 | 25 | 26 | 23 |
| Cicero | Baldwinsville | 21 | 23 | 21 | 23 |
| | Destiny USA | 13 | 11 | 13 | 11 |
| | Downtown | 17 | 14 | 17 | 16 |
| | Fairmount | 23 | 22 | 23 | 23 |
| | Fayetteville/Manlius | 19 | 19 | 18 | 19 |
| | LaFayette | 28 | 25 | 28 | 27 |
| | Liverpool | 13 | 14 | 13 | 13 |
| | St. Joseph's Hospital | 17 | 13 | 17 | 16 |
| | University Hill | 21 | 18 | 21 | 19 |
| Destiny USA | Baldwinsville | 22 | 25 | 22 | 26 |
| | Cicero | 11 | 13 | 10 | 11 |
| | Downtown | 8 | 9 | 8 | 10 |
| | Fairmount | 11 | 14 | 11 | 15 |
| | Fayetteville/Manlius | 18 | 19 | 17 | 21 |
| | LaFayette | 21 | 20 | 19 | 21 |
| | Liverpool | 8 | 10 | 8 | 9 |
| | St. Joseph's Hospital | 7 | 8 | 7 | 8 |
| | University Hill | 13 | 13 | 12 | 13 |
| Downtown | Baldwinsville | 20 | 21 | 19 | 21 |
| | Cicero | 16 | 15 | 13 | 14 |
| | Destiny USA | 6 | 6 | 5 | 5 |
| | Fairmount | 13 | 14 | 12 | 13 |
| | Fayetteville/Manlius | 16 | 17 | 15 | 16 |
| | LaFayette | 17 | 18 | 17 | 17 |
| | Liverpool | 10 | 10 | 8 | 9 |
| | St. Joseph's Hospital | 4 | 3 | 3 | 3 |
| | University Hill | 7 | 8 | 7 | 7 |
| Fairmount | Baldwinsville | 17 | 18 | 18 | 19 |
| | Cicero | 22 | 23 | 22 | 22 |
| | Destiny USA | 13 | 13 | 13 | 13 |
| | Downtown | 13 | 13 | 13 | 13 |

**Table 5-5**
**No Build Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | 2050 | |
|---|---|---|---|---|---|
| **Origin** | **Destination** | **AM** | **PM** | **AM** | **PM** |
| Fairmount | Fayetteville/Manlius | 23 | 23 | 23 | 23 |
| | LaFayette | 23 | 23 | 25 | 24 |
| | Liverpool | 17 | 17 | 17 | 18 |
| | St. Joseph's Hospital | 16 | 13 | 14 | 13 |
| | University Hill | 17 | 16 | 17 | 15 |
| Fayetteville/ Manlius | Cicero | 28 | 29 | 28 | 30 |
| | Destiny USA | 17 | 17 | 16 | 17 |
| | Downtown | 13 | 14 | 13 | 14 |
| | Fairmount | 15 | 14 | 14 | 14 |
| | Fayetteville/Manlius | 21 | 22 | 20 | 22 |
| | LaFayette | 18 | 19 | 18 | 19 |
| | Liverpool | 17 | 18 | 17 | 18 |
| | St. Joseph's Hospital | 13 | 13 | 13 | 13 |
| | University Hill | 16 | 16 | 16 | 15 |
| LaFayette | Baldwinsville | 30 | 31 | 31 | 32 |
| | Destiny USA | 25 | 25 | 25 | 24 |
| | Downtown | 15 | 15 | 16 | 16 |
| | Fairmount | 16 | 16 | 17 | 16 |
| | Fayetteville/Manlius | 23 | 24 | 23 | 24 |
| | LaFayette | 18 | 18 | 18 | 18 |
| | Liverpool | 19 | 20 | 20 | 20 |
| | St. Joseph's Hospital | 17 | 18 | 19 | 16 |
| | University Hill | 15 | 15 | 17 | 15 |
| Liverpool | Baldwinsville | 13 | 15 | 14 | 14 |
| | Cicero | 14 | 15 | 13 | 14 |
| | Downtown | 7 | 6 | 6 | 7 |
| | Fairmount | 11 | 9 | 10 | 12 |
| | Fayetteville/Manlius | 16 | 17 | 16 | 19 |
| | LaFayette | 21 | 20 | 20 | 22 |
| | Liverpool | 24 | 20 | 22 | 23 |
| | St. Joseph's Hospital | 11 | 8 | 10 | 11 |
| | University Hill | 17 | 13 | 14 | 15 |
| St. Joseph's Hospital | Baldwinsville | 21 | 21 | 20 | 23 |
| | Cicero | 13 | 13 | 12 | 12 |
| | Destiny USA | 3 | 3 | 3 | 4 |
| | Fairmount | 4 | 3 | 3 | 3 |
| | Fayetteville/Manlius | 14 | 14 | 13 | 15 |
| | LaFayette | 14 | 16 | 14 | 15 |
| | Liverpool | 18 | 18 | 18 | 18 |
| | St. Joseph's Hospital | 7 | 8 | 7 | 8 |
| | University Hill | 7 | 8 | 7 | 7 |

**Table 5-5**
**No Build Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | 2050 | |
|---|---|---|---|---|---|
| **Origin** | **Destination** | **AM** | **PM** | **AM** | **PM** |
| University Hill | Baldwinsville | 21 | 24 | 21 | 24 |
| | Cicero | 16 | 18 | 15 | 16 |
| | Destiny USA | 7 | 8 | 7 | 7 |
| | Downtown | 6 | 7 | 6 | 6 |
| | Fayetteville/Manlius | 14 | 17 | 14 | 15 |
| | LaFayette | 15 | 17 | 15 | 17 |
| | Liverpool | 16 | 18 | 16 | 16 |
| | St. Joseph's Hospital | 10 | 12 | 10 | 11 |
| | University Hill | 7 | 7 | 7 | 6 |

## Traffic Volumes

*Existing Traffic Volumes*

Traffic volume data was developed for numerous highway segments and more than 260 intersections in the Project Area. Existing traffic volumes were developed from traffic data collected during the November 2013 data collection program, and included 24-hour automatic traffic recorder (ATR) and turning movement counts (TMC), Available data previously assembled by the Syracuse Metropolitan Transportation Council (SMTC) and NYSDOT for the *I-81 Corridor Study* also were used for the Project's traffic analyses. All counts collected prior to 2013 were factored using an annual growth rate of 0.3 percent (estimated from the SMTC Regional Travel Demand Model) to represent a common base year of 2013. Counts were adjusted from the month the count was taken to a "seasonal peak period" representing average volume levels for the fall season, which historically is the busiest time of the year during the peak hours within the project area.

Counts taken at 15-minute intervals were totaled to produce hourly volumes. The 60-minute windows with the greatest total vehicular volume were determined to be 7:30-8:30 am and 4:30-5:30 pm for the AM and PM commuter peaks, respectively.

Peak hour directional splits and truck percentages for key roadway segments within the Project Area are shown below in **Table 5-6**. Directional split percentages indicate travel is directed predominantly inward towards the city center in AM peak hour and outward away from the city center in the PM peak hour. This trend is most pronounced on I-690 west of the West Street interchange and on the northern segment of I-81. Truck percentages during the AM and PM peak hours vary from one to nine percent, and are highest on the interstate segments of I-81 and I-481.

**Table 5-6**
**2013 Existing Condition Peak Hour Directional Split and Heavy Vehicle Percentages**

| Location | Direction | AM | | PM | |
|---|---|---|---|---|---|
| | | Split % | Truck % | Split % | Truck % |
| I-81 Just North of Colvin St. Interchange | NB | 56% | 5% | 46% | 6% |
| | SB | 44% | 6% | 54% | 5% |
| I-81 Just South of Court/Spencer St. interchange | NB | 33% | 5% | 63% | 4% |
| | SB | 67% | 9% | 37% | 9% |
| I-481 Just South of I-690 Interchange | NB | 63% | 8% | 44% | 7% |
| | SB | 37% | 5% | 56% | 6% |
| I-481 Just North of I-690 Interchange | NB | 45% | 8% | 55% | 6% |
| | SB | 55% | 6% | 45% | 6% |
| I-690 Just West of Just West St. Interchange | EB | 70% | 6% | 38% | 5% |
| | WB | 30% | 4% | 62% | 3% |
| I-690 Just East of Teall Ave. Interchange | EB | 47% | 5% | 53% | 5% |
| | WB | 53% | 5% | 47% | 4% |
| Just West St. Just South of Fayette St. | NB | 33% | 3% | 52% | 3% |
| | SB | 67% | 6% | 48% | 4% |
| Clinton St. Just North of W Onondaga St. | SB | 100% | 5% | 100% | 2% |
| Salina St. Just North of W Onondaga St. | NB | 49% | 3% | 59% | 2% |
| | SB | 51% | 6% | 41% | 4% |
| State St. Just North of Harrison St. | NB | 29% | 4% | 43% | 3% |
| | SB | 71% | 4% | 57% | 1% |
| Almond St. Just North of Harrison St. | NB | 32% | 4% | 34% | 3% |
| | SB | 68% | 6% | 66% | 5% |
| Irving Ave. Just North of Harrison St. | NB | 17% | 3% | 43% | 2% |
| | SB | 83% | 3% | 57% | 2% |
| Crouse Ave. Just North of Harrison St. | NB | 100% | 3% | 100% | 2% |
| Erie Blvd. Just East of Almond St. | EB | 58% | 4% | 46% | 3% |
| | WB | 42% | 3% | 54% | 2% |
| Fayette St. Just East of Almond St. | EB | 63% | 4% | 37% | 3% |
| | WB | 37% | 4% | 63% | 2% |
| Genesee St. Just East of Almond St | EB | 48% | 4% | 53% | 2% |
| | WB | 52% | 3% | 47% | 2% |
| Harrison St. Just East of Almond St. | EB | 7% | 5% | 3% | 5% |
| | WB | 93% | 3% | 97% | 1% |
| Adams St. Just East of Almond St. | EB | 100% | 5% | 100% | 3% |

Detailed existing AM and PM peak hour balanced traffic volumes on I-81, I-481, and I-690 highway segments and ramp connections, as well as turning movements at more than 260 intersections are located in **Appendix C-3**. **Table 5-7** shows the weekday AM and PM peak hour traffic volumes, as well as Average Annual Daily Traffic (AADT), for key segments on the interstate freeways and several local roadways in the Project Area.

**Table 5-7**
**2013 Existing Traffic Volumes at Key Locations**

| Location | Direction | Weekday Peak Hour | | AADT |
|---|---|---|---|---|
| | | AM | PM | |
| I-81 Just North of Colvin Street Interchange | NB | 2,871 | 2,937 | 38,600 |
| | SB | 2,292 | 3,394 | 35,700 |
| I-81 Just South of Court/Spencer Street Interchange | NB | 2,463 | 5,787 | 46,500 |
| | SB | 5,061 | 3,425 | 45,200 |
| I-481 Just South of I-690 Interchange | NB | 3,311 | 2,658 | 29,500 |
| | SB | 1,904 | 3,430 | 27,700 |
| I-481 Just North of I-690 Interchange | NB | 2,135 | 2,902 | 25,200 |
| | SB | 2,602 | 2,329 | 24,600 |
| I-690 Just West of West Street Interchange | EB | 4,192 | 2,332 | 32,000 |
| | WB | 1,835 | 3,790 | 26,800 |
| I-690 Just East of Teall Avenue Interchange | EB | 3,480 | 4,649 | 43,600 |
| | WB | 3,949 | 4,058 | 43,000 |
| West Street Just South of Fayette Street | NB | 509 | 796 | 6,700 |
| | SB | 1,052 | 721 | 10,500 |
| Clinton Street Just North of Onondaga Street | SB | 531 | 424 | 4,900 |
| Salina Street Just North of Onondaga Street | NB | 377 | 498 | 4,700 |
| | SB | 396 | 339 | 4,000 |
| State Street Just North of Harrison Street | NB | 149 | 224 | 1,900 |
| | SB | 370 | 291 | 3,400 |
| Almond Street Just North of Harrison Street | NB | 700 | 504 | 6,200 |
| | SB | 1,477 | 959 | 12,500 |
| Irving Avenue Just North of Harrison Street | NB | 121 | 261 | 1,800 |
| | SB | 582 | 347 | 5,200 |
| Crouse Avenue Just North of Harrison Street | NB | 164 | 335 | 2,700 |
| Erie Boulevard Just East of Almond Street | EB | 360 | 341 | 3,600 |
| | WB | 262 | 396 | 3,400 |
| Fayette Street Just East of Almond Street | EB | 248 | 161 | 2,100 |
| | WB | 143 | 269 | 2,100 |
| Genesee Street Just East of Almond Street | EB | 337 | 449 | 4,100 |
| | WB | 360 | 399 | 3,800 |
| Harrison Street Just East of Almond Street | EB | 65 | 54 | 600 |
| | WB | 825 | 1,649 | 13,600 |
| Adams Street Just East of Almond Street | EB | 1,615 | 790 | 14,000 |

**Note:** AADT is the Average Annual Daily Traffic.

The largest employment centers in Onondaga County, Downtown and University Hill, are located near the geographic center of the City of Syracuse and are situated south of the I-81/I-690 interchange. The main population centers are clustered north, southeast, and west of the city center, with less development directly south and southwest of the city.

During the AM peak hour, commuters from the outlying suburbs travel inward towards the city center using I-81, I-690, and I-481. The reverse pattern occurs in the PM peak hour, as travel is concentrated directionally away from the city center. This pattern is demonstrated in **Table 5-7**. The sections of I-81 and I-690 north and east of the I-81 interchange with I-690 are the heaviest traveled roadways in the project area.

The I-81 viaduct section south of I-690 is straddled by University Hill to the east and Downtown to the west. Both locations are adjacent to the I-81 interchange with Harrison and Adams Streets. I-81 ramps connect to Almond Street that distributes traffic to and from Harrison and Adams Streets which extend into Downtown and University Hill. As a result, Harrison, Adams, and Almond Streets experience high traffic volumes in the AM and PM peak hours.

Overall, traffic volumes within the project area are higher during the PM peak hour than the AM peak hour because there are proportionally more trips for the purposes of shopping and entertainment that overlap with commuting trips during the evening hours.

*Future No Build Year Traffic Volumes*

The No Build condition represents the future without the I-81 Viaduct Project. No Build traffic volumes represent a future-year growth scenario that includes all planned/committed highway and transit improvements, except the I-81 Viaduct Project alternatives. Two future No Build years were analyzed, including the Project's Estimated Time of Completion (ETC) year 2020 and design year 2050 (ETC+30). The primary tool used for forecasting future No Build year traffic volumes is the SMTC regional travel demand model. The SMTC model predicts traffic volumes as a result of the anticipated changes in land use, population, economic activity, and the transportation system. A discussion of planned developments in the Project Area is located in **Section 6.2.1.2.5, Planned Developments**. AM and PM peak hour traffic volumes were forecasted separately for the 2020 and 2050 No Build conditions.

Detailed AM and PM peak hour No Build traffic volumes for all interstate segments, ramp connections, and intersections for the 2020 and 2050 analysis years are located in **Appendix C-3**. **Table 5-8** shows the weekday AM and PM peak hour traffic volumes, and AADT for key segments on the interstate freeways and several local roadways in the project area.

Overall, traffic volumes are expected to increase moderately by the year 2020. Traffic volume increases from 2020 to 2050 are greater due to the longer time interval, but are still modest on an annual basis. Traffic volume increases in the area can be attributed to economic development and population growth. As shown in Table **5-8** the largest traffic increases occur on the section of I-81 south of Court Street, I-690 west of West Street, and I-481 south of the I-690 interchange. Each of these routes is heavily traveled commuter routes today. Under No Build conditions, a continuation of traditional growth patterns would produce regional traffic patterns similar to existing conditions.

**Table 5-8**
**2020 and 2050 No Build Traffic Volumes at Key Locations**

| Location | Direction | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | Existing | No Build | | Existing | No Build | |
| | | 2013 | 2020 | 2050 | 2013 | 2020 | 2050 |
| I-81 Just North of Colvin Street Interchange | NB | 2,871 | 2,928 | 3,223 | 2,937 | 2,913 | 3,044 |
| | SB | 2,292 | 2,322 | 2,442 | 3,394 | 3,457 | 3,748 |
| I-81 Just South of Court/ Spencer Street Interchange | NB | 2,463 | 2,439 | 2,637 | 5,787 | 5,843 | 6,209 |
| | SB | 5,061 | 5,161 | 5,582 | 3,425 | 3,466 | 3,752 |
| I-481 Just South of I-690 Interchange | NB | 3,311 | 3,424 | 3,668 | 2,658 | 2,739 | 2,906 |
| | SB | 1,904 | 1,995 | 2,206 | 3,430 | 3,501 | 3,746 |
| I-481 Just North of I-690 Interchange | NB | 2,135 | 2,262 | 2,503 | 2,902 | 2,971 | 3,209 |
| | SB | 2,602 | 2,692 | 3,036 | 2,329 | 2,415 | 2,747 |
| I-690 Just West of West Street Interchange | EB | 4,192 | 4,432 | 4,794 | 2,332 | 2,499 | 2,751 |
| | WB | 1,835 | 1,938 | 2,142 | 3,790 | 3,952 | 4,308 |
| I-690 Just East of Teall Avenue Interchange | EB | 3,480 | 3,545 | 3,672 | 4,649 | 4,708 | 4,877 |
| | WB | 3,949 | 3,902 | 4,198 | 4,058 | 3,867 | 3,989 |
| West Street Just South of Fayette Street | NB | 509 | 486 | 430 | 796 | 818 | 768 |
| | SB | 1,052 | 1,004 | 1,062 | 721 | 643 | 685 |
| Clinton Street Just North of Onondaga Street | NB | -- | -- | 192 | -- | -- | 260 |
| | SB | 531 | 537 | 410 | 424 | 474 | 321 |
| Salina Street Just North of Onondaga Street | NB | 377 | 313 | 277 | 498 | 412 | 429 |
| | SB | 396 | 356 | 431 | 339 | 278 | 363 |
| State Street Just North of Harrison Street | NB | 149 | 164 | 150 | 224 | 231 | 273 |
| | SB | 370 | 368 | 421 | 291 | 317 | 323 |
| Almond Street Just North of Harrison Street | NB | 700 | 698 | 728 | 504 | 510 | 508 |
| | SB | 1,477 | 1,503 | 1,561 | 959 | 986 | 1,139 |
| Irving Avenue Just North of Harrison Street | NB | 121 | 118 | 137 | 261 | 270 | 312 |
| | SB | 582 | 545 | 622 | 347 | 351 | 384 |
| Crouse Avenue Just North of Harrison Street | NB | 164 | 175 | 171 | 335 | 376 | 364 |
| Erie Boulevard Just East of Almond Street | EB | 360 | 356 | 410 | 341 | 351 | 392 |
| | WB | 262 | 269 | 307 | 396 | 388 | 439 |
| Fayette Street Just East of Almond Street | EB | 248 | 271 | 280 | 161 | 154 | 181 |
| | WB | 143 | 149 | 154 | 269 | 289 | 292 |
| Genesee Street Just East of Almond Street | EB | 337 | 351 | 363 | 449 | 453 | 470 |
| | WB | 360 | 362 | 379 | 399 | 365 | 428 |
| Harrison Street Just East of Almond Street | EB | 65 | 48 | 110 | 54 | 53 | 77 |
| | WB | 825 | 825 | 902 | 1,649 | 1,622 | 1,834 |
| Adams Street Just East of Almond Street | EB | 1,615 | 1,705 | 1,827 | 790 | 803 | 946 |

**Note:** AADT is the Average Annual Daily Traffic.

It is important to note that circulation patterns in the downtown area are expected to change to some extent in 2050, as plans to convert portions of Clinton Street and other arterials from one-way to two-way operation are implemented. In 2050, northbound travel would be permitted on Clinton Street. Southbound travel on Clinton Street would decrease as parallel north-south roads would compensate under the modified configuration.

## Level of Service and Mobility

The operating performance of a roadway segment or intersection is commonly measured by level of service (LOS), based on such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. The 2010 Highway Capacity Manual (HCM) defines six LOS ratings (letters A through F), with LOS A representing free-flow conditions and LOS F signifying unstable or breakdown conditions. The remaining LOS letters represent gradually declining traffic conditions as traffic performance drops from LOS B through LOS E, with E being the capacity of the roadway.

*Freeway Level of Service*

Specific criteria/measures are used to define LOS for different types of roadway facilities. In the case of basic freeway segments (BFS), LOS is based on the density of vehicles in the traffic stream, defined in terms of passenger car equivalents per-mile per-lane (pc/mi/ln). LOS for ramp operations is determined based on the density of the vehicles within the influence areas (typically including the outer two lanes of the freeway) created by the merging or diverging vehicles. The influence area for these movements typically extends 1,500 feet downstream of an entrance ramp or 1,500 feet upstream of an exit ramp. LOS for weaving areas also is determined by density. Traffic within a weaving area is subject to turbulence, normally in the form of forced lane changes within a restricted distance. Although there are both weaving and non-weaving vehicles within a weaving area, a single LOS is used to describe operations within the weaving area. The LOS of basic freeway segments, freeway ramps (ramp merge and diverge areas), and weaving areas would be determined by relating their respective VISSIM density calculations to the LOS criteria (as defined in the 2010 HCM) in **Table 5-9**.

**Table 5-9**
**Freeway Level of Service Criteria**

| Level of Service (LOS) | Density (pc/mi/ln) | | |
|---|---|---|---|
| | Basic Segments | Ramp Merge and Diverge Areas | Weaving Segments |
| A | ≤ 11 | ≤ 10 | ≤ 10 |
| B | > 11 - 18 | > 10 - 20 | > 10 - 20 |
| C | > 18 - 26 | > 20 - 28 | > 20 - 28 |
| D | > 26 - 35 | > 28 - 35 | > 28 - 35 |
| E | > 35 - 45 | > 35 | > 35 - 43 |
| F | > 45 | Demand exceeds capacity | > 43 |

*Intersection Level of Service*

LOS for intersections is defined in terms of average control delay (in seconds) per vehicle during peak traffic demand periods. Control delay is defined as the portion of the total delay attributed to traffic control devices, either traffic signals or stop signs. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, LOS is related to the control delay for all movements, while for

unsignalized intersections, LOS is for each stop-controlled movement. For two-way stop-controlled intersections, LOS depends on the amount of delay experienced by drivers on the minor (stop-controlled) approaches. All-way stop-controlled intersections require drivers on all approaches to stop before proceeding into the intersection, so LOS is determined by the average computed delay for all movements.

The LOS of signalized and unsignalized intersections would be determined by relating their respective VISSIM delay calculations to the LOS criteria (as defined in the 2010 HCM) in **Table 5-10**. While HCM defines LOS of an intersection based on control delay, VISSIM only reports total delays for all movements at intersections. Although total delay is larger than control delay, the difference between the two is usually very small.

**Table 5-10**
**Intersection Level of Service Criteria**

| Level of Service (LOS) | Average Control Delay (sec/veh) | |
|---|---|---|
| | Signalized Intersection | Unsignalized Intersection |
| A | ≤ 10 | ≤ 10 |
| B | > 10-20 | > 10-15 |
| C | > 20-35 | > 15-25 |
| D | > 35-55 | > 25-35 |
| E | > 55-80 | > 35-50 |
| F | > 80 | > 50 |

*Existing Level of Service and Mobility*

Based on VISSIM density measures, existing AM and PM peak hour LOS analyses were conducted for all segments of I-81, I-481, and I-690 within the Project Area (see **Appendix C-3**). This section focuses on selected critical sections of I-81, I-481, and I-690 as follows:

- Northbound I-81 from the East Colvin Street on-ramp to the Hiawatha Boulevard on-ramp and southbound I-81 from the Old Liverpool Road on-ramp to the South State Street off-ramp. The northern and southern I-81/I-481 interchanges also are included.
- Northbound I-481 from the Interchange 3E (NY 5) off-ramp to the Interchange 4 (I-690) on-ramp and southbound I-481 from the Interchange 4 (I-690) off-ramp to the Interchange 3E (NY 5) on-ramp.
- Eastbound I-690 from the Willis Avenue on-ramp to the Teall Avenue on-ramp and westbound I-690 from the Teall Avenue off-ramp to the Hiawatha Boulevard on-ramp.

Levels of service were calculated for basic freeway segments, freeway ramps, and weaving segments using the VISSIM models developed for the Project. VISSIM accounts for operational characteristics of all individual vehicles traveling over a freeway segment or ramp and determines the segment or ramp LOS based on the density of vehicles in the traffic stream. The results of the freeway segment, ramp merging and diverging, and weaving analyses are presented in **Table 5-11.**

**Table 5-11**
**2013 Exisitng Freeway LOS Analysis**

| Segment | Type | AM Density (pc/mi/ln) | AM LOS | PM Density (pc/mi/ln) | PM LOS |
|---|---|---|---|---|---|
| **Northbound I-81** | | | | | |
| between Interchange 16A (I-481 North) off and on-ramps | BFS | 4.5 | A | 8.4 | A |
| between Interchange 17 (E. Colvin St) on-ramp and Exit 18 (Adams St) | BFS | 18.8 | C | 22.2 | C |
| between Interchange 18 (Adams St, Harrison St) off and on-ramps | BFS | 21.7 | C | 24.2 | C |
| between Westbound I-690 off and on-ramps | BFS | 13.5 | B | 35 | D |
| between Interchange 19 (Pearl St) and Interchange 20 (Butternut St) on-ramps | BFS | 10.2 | A | 28.2 | D |
| between Interchange 22 (Court St) off and on-ramps | BFS | 14.1 | B | 34.4 | D |
| between Interchange 23 (Park St, Hiawatha Blvd) off and on-ramps | BFS | 9.7 | A | 22.9 | C |
| between Exit 29S (I-481 SB) and Southbound NY 481 on-ramp | BFS | 9.3 | A | 21 | C |
| between Exit 29N (NY 481 NB) and Northbound I-481 on-ramp | BFS | 6.8 | A | 13 | B |
| at Exit 16A (I-481 North) off-ramp | Diverge | 9.8 | A | 10.2 | B |
| at Exit 18 (Adams St, Harrison St) | Diverge | 19 | B | 27.4 | C |
| at Westbound I-690 off-ramp | Diverge | 12.9 | B | 30.9 | D |
| at Exit 22 (Court St) | Diverge | 14.4 | B | 31.1 | D |
| at Exit 29S (I-481 South) | Diverge | 9.4 | A | 18.6 | B |
| at Interchange 17 (E. Colvin St) on-ramp | Merge | 15.4 | B | 16.6 | B |
| at Westbound I-690 on-ramp | Merge | 13.0 | A | 29.8 | D |
| at Interchange 19 (N. Salina St, Pearl St) on-ramp | Merge | 14.5 | B | 33.3 | D |
| at Interchange 20 (Butternut St) on-ramp | Merge | 13.4 | A | 33.1 | D |
| at Interchange 23 (Hiawatha Blvd) on-ramp | Merge | 14.3 | B | 27.8 | C |
| at Interchange 29S (I-481) on-ramp | Merge | 8.4 | A | 15.5 | B |
| between Interchange 18 (Harrison St) and Eastbound I-690 off-ramps | Weave | 16.5 | C | 37.8 | E |
| between Interchange 22 (Court St) on-ramp and Exit 23 (Park St, Hiawatha Blvd) | Weave | 11.8 | B | 29.1 | D |
| between Interchange 29N (NY 481) on and off-ramps | Weave | 7.6 | B | 17.2 | C |
| **Southbound I-81** | | | | | |
| between Exit 29N (NY 481 NB) and Northbound I-481 on-ramp | BFS | 15.7 | B | 9.1 | A |
| between Exit 29S (I-481 SB) and Southbound NY 481 on-ramp | BFS | 25.1 | C | 14.8 | B |
| between Exits 23A and Old Liverpool Rd on-ramp | BFS | 21.6 | C | 16.4 | B |
| between Onondaga Lake Pkwy on-ramp and Interchange 22 (Bear St) on-ramp | BFS | 55 | F | 21.8 | C |
| between Interchange 21 (Spencer/Catawba St) off and on-ramps | BFS | 59.4 | F | 23.9 | C |
| between Eastbound I-690 off and on-ramps | BFS | 83.9 | F | 28.1 | D |
| between Exit 18 (Harrison St, Adams St) and West I-690 on-ramp | BFS | 17.3 | B | 23.1 | C |
| between Westbound I-690 and Interchange 18 (Adams St) on-ramps | BFS | 19.8 | C | 25.2 | C |
| between Interchange 18 (Adams St) and Exit 17 (S. State St) | BFS | 14.1 | B | 22.5 | C |
| between Interchange 16A (I-481) off and on-ramps | BFS | 9.9 | A | 14.4 | B |
| at Exit 29N (NY 481) | Diverge | 19.1 | B | 7.9 | A |
| at Exit 21 (Spencer/Catawba St) | Diverge | 60.6 | F | 19.8 | B |
| at Exit 18 (Harrison St, Adams St) | Diverge | 50.5 | F | 32.3 | D |
| at Exit 19 (Clinton St, Salina St) | Diverge | 74.9 | F | 23 | C |
| at Eastbound I-690 off-ramp | Diverge | 81.8 | F | 29.6 | D |
| at Exit 17 (S. Salina St, Brighton Av) | Diverge | 13.6 | B | 19.2 | B |
| at Exit 16 (I-481) off-ramp | Diverge | 9.8 | A | 10.2 | B |
| at Interchange 29N (NY 481) on-ramp | Merge | 23.5 | C | 14.6 | B |
| at Old Liverpool Rd on-ramp | Merge | 43.2 | F | 16.5 | B |
| at Onondaga Lake Pkwy (NY370) on-ramp | Merge | 42.3 | F | 18.7 | B |
| at Interchange 22 (Bear St) on-ramp | Merge | 43.1 | F | 21.7 | C |
| at Eastbound I-690 on-ramp | Merge | 80.8 | F | 20.3 | C |
| at Westbound I-690 on-ramp | Merge | 15.4 | B | 20.1 | C |
| at Interchange 18 (Harrison St, Adams St) on-ramp | Merge | 6.9 | A | 11.4 | B |
| at Interchange 16A (I-481) on-ramp | Merge | 9.1 | A | 13.6 | B |
| between Interchange 29S (I-481) on and off-ramps | Weave | 15.9 | C | 8.7 | B |
| between Interchange 21 (Spencer/Catawba St) on-ramp and Exit 20 (Franklin St) | Weave | 53.3 | F | 19.8 | B |

**Table 5-11**
**2013 Exisitng Freeway LOS Analysis**

| Segment | Type | AM Density (pc/mi/ln) | AM LOS | PM Density (pc/mi/ln) | PM LOS |
|---|---|---|---|---|---|
| **Northbound I-481** | | | | | |
| between Interchange 1 (Brighton Av, Rock Cut Rd) off and on-ramps | BFS | 6.9 | A | 8.2 | A |
| between Interchange 3E (East NY 5) off and on-ramps | BFS | 12.3 | B | 10 | A |
| between Interchange 3W (West NY 5) off and on-ramps | BFS | 12.4 | B | 11 | B |
| between Interchange 3W (West NY 5) on-ramp and Exit 4 (West I-690) | BFS | 19.2 | C | 14.9 | B |
| between Interchange 4 (I-690) off and on-ramps | BFS | 11.8 | B | 11.9 | B |
| between Interchange 4 (East I-690) on-ramp and Exit 5E (Kirkville Rd) | BFS | 17.8 | B | 24.1 | C |
| between Interchange 5E (Kirkville Rd) off and on-ramps | BFS | 16.8 | B | 20.7 | C |
| between Interchange 5W (Kirkville Rd) off and on-ramps | BFS | 12.4 | B | 19.6 | C |
| between Interchange 5W (Kirkville Rd) on-ramp and Exit 6 (I-90) | BFS | 14.2 | B | 22 | C |
| between Interchange 9N (I-81) off and on-ramps | BFS | 6.9 | A | 15 | B |
| between Interchange 9S (I-81) off and on-ramps | BFS | 9.6 | A | 26.9 | D |
| at Exit 3E (East NY 5) | Diverge | 10.2 | B | 8.7 | A |
| at Exit 4 (West I-690) | Diverge | 15.2 | B | 12.9 | B |
| at Exit 5E (Kirkville Rd) | Diverge | 12.7 | B | 20.5 | C |
| at Exit 9N (I-81) | Diverge | 7.4 | A | 17.1 | B |
| at Interchange 1 (Brighton Av, Rock Cut Rd) on-ramp | Merge | 8.8 | A | 8.5 | A |
| at Interchange 3W (West NY 5) on-ramp | Merge | 17.9 | B | 14.5 | B |
| at Interchange 4 (East I-690) on-ramp | Merge | 12.2 | B | 17.3 | B |
| at Interchange 5W (Kirkville Rd) on-ramp | Merge | 9.5 | A | 14.3 | B |
| at Interchange 9S (I-81) on-ramp | Merge | 7.2 | A | 18.5 | B |
| between I-81 on-ramp and Exit 1 (Brighton Av, Rock Cut Rd) | Weave | 5.5 | A | 7.8 | B |
| between Interchange 3E (East NY 5) on-ramp and Exit 3W (West NY 5) | Weave | 10 | B | 9.1 | B |
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 5W (Kirkville Rd) | Weave | 12.4 | B | 15.9 | B |
| between Interchange 9N (I-81) on-ramp and Exit 9S (I-81) | Weave | 8.8 | B | 23.2 | C |
| **Southbound I-481** | | | | | |
| between Interchange 9S (I-81) off and on-ramps | BFS | 18.1 | C | 11.2 | B |
| between Interchange 9N (I-81) off and on-ramps | BFS | 24.7 | C | 12.7 | B |
| between Interchange 6 (I-90) on-ramp and Exit 5W (Kirkville Rd) | BFS | 20.6 | C | 17.1 | B |
| between Interchange 5W (Kirkville Rd) off and on-ramps | BFS | 17.6 | B | 15.8 | B |
| between Interchange 5E (Kirkville Rd) off and on-ramps | BFS | 18.7 | C | 14.7 | B |
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 4 (West I-690) | BFS | 22 | C | 19.7 | C |
| between Interchange 4 (I-690) off and on-ramps | BFS | 9.9 | A | 11.8 | B |
| between Interchange 4 (East I-690) on-ramp and Exit 3W (West NY 5) | BFS | 10.6 | A | 19 | C |
| between Interchange 3W (West NY 5) off and on-ramps | BFS | 9.4 | A | 17.2 | B |
| between Interchange 3E (East NY 5) off and on-ramps | BFS | 6.2 | A | 8.7 | A |
| between Northbound I-81 off-ramp and E. Brighton Av on-ramp | BFS | 10.4 | A | 3.1 | A |
| at Exit 9S (I-81) | Diverge | 9.4 | A | 8.4 | A |
| at Exit 5W (Kirkville Rd) | Diverge | 12.4 | B | 11.7 | B |
| at Exit 4 (West I-690) | Diverge | 14.9 | B | 11.8 | B |
| at Exit 3W (West NY 5) | Diverge | 24.9 | C | 19.7 | B |
| at Exit 1 (Brighton Av) | Diverge | 10.2 | B | 15.8 | B |
| at Northbound I-81 and South I-81 ramps | Diverge | 9.7 | A | 11.1 | B |
| at Interchange 9N (I-81) on-ramp | Merge | 17.6 | B | 9.1 | A |
| at Interchange 5E (Kirkville Rd) on-ramp | Merge | 15.2 | B | 13.9 | B |
| at Interchange 4 (East I-690) on-ramp | Merge | 9.9 | A | 19.5 | B |
| at Interchange 3E (East NY 5) on-ramp | Merge | 6.7 | A | 10.2 | B |
| at E. Brighton Av on-ramp | Merge | 13.4 | B | 7.6 | A |
| between Interchange 9S (I-81) on-ramp and Exit 9N (I-81) | Weave | 18 | B | 10.3 | B |
| between Interchange 5W (Kirkville Rd) on-ramp and Exit 5E (Kirkville Rd) | Weave | 14.4 | B | 11.7 | B |
| between Interchange 3W (West NY 5) on-ramp and Exit 3E (East NY 5) | Weave | 11.5 | B | 16.7 | B |

**Table 5-11**
**2013 Exisitng Freeway LOS Analysis**

| Segment | Type | AM | | PM | |
|---|---|---|---|---|---|
| | | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS |
| **Eastbound I-690** | | | | | |
| between Exit 8 (Hiawatha Blvd) and Exit 9 (Bear St) | BFS | 24 | C | 11 | B |
| between Exit 9 (Bear St) and Interchange 10 (N. Geddes St) on-ramp | BFS | 24.7 | C | 9.6 | A |
| between Interchange 11 West St off- and on-ramp | BFS | 50.1 | F | 21.3 | C |
| between Southbound I-81 off and on-ramps | BFS | 22 | C | 21.9 | C |
| between Northbound I-81 on-ramp and Exit 14 (Teall Av) | BFS | 29.4 | D | 32.1 | D |
| between Interchange 14 (Teall Av) off and on-ramps | BFS | 20.8 | C | 27.6 | D |
| at Exit 8 (Hiawatha Blvd) | Diverge | 21.6 | C | 13.6 | B |
| at Exit 9 (Bear St) | Diverge | 20.3 | C | 10.6 | B |
| at Southbound I-81 off-ramp | Diverge | 54.7 | F | 32.2 | D |
| at Exit 14 (Teall Av) | Diverge | 35.5 | E | 26.7 | C |
| at Interchange 11 (West St) on-ramp | Merge | 49.7 | F | 23.1 | C |
| at Southbound I-81 on-ramp | Merge | 12.5 | B | 11.1 | B |
| at N. McBride St on-ramp | Merge | 19.3 | B | 30.8 | D |
| at Northbound I-81 on-ramp | Merge | 25.4 | C | 31.2 | D |
| at Interchange 14 (Teall Av) on-ramp | Merge | 20.3 | C | 26.3 | C |
| between Interchange 10 (N. Geddes St) on-ramp and Exit 11 (West St) | Weave | 33.4 | E | 11.8 | B |
| **Westbound I-690** | | | | | |
| between Interchange 14 (Teall Av) off and on-ramps | BFS | 19 | C | 23.3 | C |
| between Interchange 14 (Teall Av) on-ramp and South I-81 off-ramp | BFS | 22.3 | C | 29 | D |
| between Exit 13 (Townsend St) and North I-81 off- and on-ramp | BFS | 12.2 | B | 21.9 | C |
| between Northbound I-81 off and on-ramps | BFS | 12.4 | B | 21.3 | C |
| between Interchange 11 (West St) off and on-ramps | BFS | 15.1 | B | 25.6 | C |
| between Exit 10 (N. Geddes St) and Interchange 9 (Bear St) on-ramp | BFS | 7.9 | A | 19.1 | C |
| between Interchange 9 (Bear St) and Interchange 8 (State Fair Blvd) on-ramps | BFS | 10.7 | A | 25.1 | C |
| at Exit 14 (Teall Av) off-ramp | Diverge | 19.2 | B | 21.7 | C |
| at Southbound I-81 off-ramp | Diverge | 11.1 | B | 14 | B |
| at Exit 13 (Townsend St) | Diverge | 21.1 | C | 22.1 | C |
| at Northbound I-81 off-ramp | Diverge | 12.1 | B | 22.3 | C |
| at Exit 11 (West St) off-ramp | Diverge | 20 | B | 31.2 | D |
| at Interchange 14 (Teall Av) on-ramp | Merge | 19.6 | B | 25.6 | C |
| at Northbound I-81 on-ramp | Merge | 31.8 | D | 24.3 | C |
| at Interchange 9 (Bear St) on-ramp | Merge | 5.6 | A | 12.2 | B |
| at Interchange 8 (Hiawatha Blvd) on-ramp | Merge | 11.6 | B | 23.7 | C |
| between Interchange 11 (West St) on-ramp and Exit 10 (N. Geddes St) | Weave | 9.1 | A | 18.6 | B |

The results of this basic freeway segment analysis indicate that all segments of I-481 and nearly all segments of I-81 and I-690 currently operate at LOS D (which is considered acceptable) or better during the AM and PM peak hours. The segments that operate at unacceptable LOS (i.e., LOS E or LOS F) include:

- Southbound I-81 between the eastbound I-690 off- and on-ramps (AM peak hour);
- Southbound I-81 between the Interchange 21 (Spencer Street/Catawba Street) off- and on-ramps (AM peak hour)
- Southbound I-81 between the Onondaga Lake Parkway on-ramp and Interchange 22 (Bear Street) on-ramp (AM peak hour)
- Eastbound I-690 between the Interchange 11 (West Street) off- and on-ramps (AM peak hour)

It should be noted that these four segments operate at unacceptable LOS in the AM peak hour only. During the PM peak hour, all segments of I-81, I-481, and I-690 operate at LOS D or better. This is to be expected since the larger suburban population centers are located to the north and motorists use southbound I-81 in the morning to reach the large Downtown and University Hill employment centers.

The results of the merging and diverging analysis indicate that all ramps on northbound I-81 during the AM peak hour, northbound and southbound I-81 during the PM peak hour, northbound and southbound I-481 during the AM and PM peak hours, westbound I-690 during the AM peak hour, and eastbound and westbound I-690 during the PM peak hour operate at LOS D or better. The merging segments that operate at unacceptable LOS include:

- Southbound I-81 at eastbound I-690 on-ramp (AM peak hour)
- Southbound I-81 at the Interchange 22 (Bear Street) on-ramp (AM peak hour)
- Southbound I-81 at the Old Liverpool Road on-ramp (AM peak hour)
- Southbound I-81 at the Onondaga Lake Parkway on-ramp (AM peak hour)
- Eastbound I-690 at the Interchange 11 (West Street) on-ramp (AM peak hour)

The diverging segments that operate at unacceptable LOS include:

- Southbound I-81 at eastbound I-690 (AM peak hour);
- Southbound I-81 at Exit 18 (Harrison Street/Adams Street) (AM peak hour)
- Southbound I-81 at Exit 19 (Clinton Street/Salina Street) (AM peak hour)
- Southbound I-81 at Exit 21 (Spencer Street/Catawba Street) (AM peak hour)
- Eastbound I-690 at the southbound I-81 off-ramp (AM peak hour)
- Eastbound I-690 at Exit 14 (Teall Avenue) (AM peak hour)
- Northbound I-81 between Interchange 18 (Harrison Street) and the eastbound I-690 off-ramp (PM peak hour)
- Southbound I-81 between the Interchange 21 (Spencer Street/Catawba Street) on-ramp and Exit 20 (Franklin Street) (AM peak hour)
- Eastbound I-690 between the Interchange 10 (N. Geddes Street) on-ramp and Exit 11 (West Street) (AM peak hour)

VISSIM was used to conduct signalized and unsignalized intersection analyses for the weekday AM and PM peak hours under existing (2013) conditions. VISSIM tracks the operating characteristics of each individual vehicle passing through an intersection and determines the LOS through the intersection using parameters such as average vehicle delay for the intersections and approaches. A total of 260 intersections in the Project Area were analyzed to evaluate existing traffic operations. This intersection LOS discussion in this document focuses on 113 critical intersections only. The criteria used for selecting these intersections include:

- The intersection LOS is not acceptable (LOS E or F)
- The intersection would be modified or reconstructed under the project alternatives

- The intersection is expected to incur notable changes in traffic volumes (due to project-induced traffic pattern changes)
- The intersection is a key part of a major corridor

**Table 5-12**
**2013 Existing Intersection Level of Service Analysis**

| ID | Intersection Name | 2013 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West St. at NY 5/W. Genesee St. | 53.8 | D | 15.3 | B |
| D-10 | Wallace St. at NY 5/W. Genesee St. | 50.8 | D | 5.7 | A |
| D-11 | N. Franklin St. /Butternut St. at N. Franklin St. | 7.5 | A | 8.1 | A |
| D-12 | N. Franklin St. at Herald Pl | 12.3 | B | 11.0 | B |
| D-13 | N. Franklin St. at NY 5/W. Genesee St. | 45.1 | D | 21.2 | C |
| D-19 | N. Clinton St. at Webster Landing | 0.3 | A | 0.2 | A |
| D-21 | N. Clinton St. at NY 5/W. Genesee St. | 41.9 | D | 25.3 | C |
| D-24 | S. Clinton St. at W. Washington St. | 16.9 | B | 15.4 | B |
| D-25 | S. Clinton St. at W. Fayette St. | 14.1 | B | 5.9 | A |
| D-27 | S. Clinton St. at W. Onondaga St. | 18.2 | B | 15.0 | B |
| D-28 | S. Clinton St. at W. Adams St. | 14.1 | B | 13.1 | B |
| D-32 | N. Salina St. at Herald Pl | 12.0 | B | 16.3 | B |
| D-33 | N. Salina St. at E./W. Willow St. | 22.7 | C | 5.3 | A |
| D-34 | N. Salina St. at NY 5/W. Genesee St./James St. | 21.6 | C | 17.7 | B |
| D-36 | S. Salina St. at E./W. Washington St. | 22.4 | C | 12.4 | B |
| D-37 | S. Salina St. at E./W. Fayette St. | 17.4 | B | 15.8 | B |
| D-39 | S. Salina St. at Harrison St. and Onondaga St. | 27.5 | C | 34.0 | C |
| D-40 | S. Salina St. at E./W. Adams St. | 36.1 | D | 24.8 | C |
| D-46 | Pearl St. at Hickory St. | 4.2 | A | 4.5 | A |
| D-47 | Pearl St. at E. Willow St. | 0.5 | A | 0.8 | A |
| D-48 | N. Warren St. at E. Willow St. | 7.9 | A | 7.9 | A |
| D-49 | N. Warren St. at NY 5/James St. | 22.6 | C | 9.6 | A |
| D-50 | N. Warren St. at E. Erie Blvd. | 1.8 | A | 1.1 | A |
| D-56 | S. Warren St. at Harrison St. | 21.4 | C | 17.5 | B |
| D-57 | S. Warren St. at E. Adams St. | 7.7 | A | 12.9 | B |
| D-58 | Oswego Blvd. at James St. | 43.3 | D | 33.2 | C |
| D-59 | NY 5/Oswego Blvd./ at Montgomery St. | 10.0 | A | 8.7 | A |
| D-66 | Montgomery St. at Harrison St. | 6.2 | A | 14.2 | B |
| D-67 | Montgomery St. at E. Adams St. | 8.1 | A | 13.3 | B |
| D-68 | US 11/N. State St. at Hickory St. | 1.2 | A | 2.1 | A |
| D-69 | US 11/N. State St. at E. Willow St. | 11.5 | B | 13.3 | B |

**Table 5-12**
**2013 Existing Intersection Level of Service Analysis**

| ID | Intersection Name | 2013 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-71 | US 11/S. State St. at NY 5/Erie Blvd. E. | 27.6 | C | 16.4 | B |
| D-73 | US 11/S. State St. at E. Washington St. | 17.2 | B | 19.1 | B |
| D-78 | US 11/S. State St. at Harrison St. | 20.6 | C | 12.2 | B |
| D-79 | US 11/S. State St. at E. Adams St. | 11.2 | B | 15.2 | B |
| D-83 | N. Townsend St. at Westbound I-690 off-ramp | 13.6 | B | 14.4 | B |
| D-84 | N./S. Townsend St. at NY 5/Erie Blvd. E. | 13.8 | B | 16.2 | B |
| D-86 | S. Townsend St. at E. Washington St. | 10.2 | B | 10.5 | B |
| D-87 | S. Townsend St. at E. Fayette St. | 15.5 | B | 11.3 | B |
| D-88 | S. Townsend St. at NY 92/E. Genesee St. | 9.9 | A | 13.3 | B |
| D-89 | S. Townsend St. at Harrison St. | 14.4 | B | 15.5 | B |
| D-90 | S. Townsend St. at E. Adams St. | 27.2 | C | 41.3 | D |
| D-92 | N. McBride St. at EB I-690 On-ramp | 0.7 | A | 2.1 | A |
| D-93 | N./S. McBride St. at NY 5/Erie Blvd. E. | 20.0 | B | 27.2 | C |
| D-99 | Catherine St. at Burnet Ave. | 16.6 | B | 12.4 | B |
| D-100 | Almond St./Catherine St. at NY 5/Erie Blvd. E. | 7.4 | A | 12.8 | B |
| D-101 | Almond St. at E. Water St. | 16.0 | B | 19.2 | B |
| D-102 | Almond St. at E. Washington St. | 8.9 | A | 12.9 | B |
| D-103 | Almond St. at E. Fayette St. | 17.8 | B | 15.7 | B |
| D-104 | Almond St. at NY 92/E. Genesee St. | 18.2 | B | 14.7 | B |
| D-105 | Almond St. at Southbound I-81 Off-Ramp | 16.8 | B | 11.0 | B |
| D-106 | Harrison St. at Southbound I-81 Off-Ramp | 1.4 | A | 0.5 | A |
| D-107 | Almond St. at Harrison St. | 39.8 | D | 33.2 | C |
| D-108 | Almond St. at E. Adams St. | 52.0 | D | 52.3 | D |
| D-109 | Almond St. at Burt St. | 18.0 | B | 13.9 | B |
| D-110 | Almond St. at Van Buren St. | 10.3 | B | 4.0 | A |
| D-116 | Midland Ave. at W. MLK Jr | 1.6 | A | 3.8 | A |
| D-118 | West St. at Westbound I-690 Ramps | N/A | N/A | N/A | N/A |
| D-119 | West St. at Eastbound I-690 Ramps | N/A | N/A | N/A | N/A |
| D-120 | Southbound I-81 Off-ramp and Willow St. | N/A | N/A | N/A | N/A |
| D-121 | Pearl St. at James St. | N/A | N/A | N/A | N/A |
| D-122 | Almond St. and MLK Jr. E. | N/A | N/A | N/A | N/A |
| D-123 | Catherine St. at Westbound I-690 Off-Ramp | N/A | N/A | N/A | N/A |
| D-124 | Catherine St. at Eastbound I-690 On-ramp | N/A | N/A | N/A | N/A |
| D-125 | MLK Jr. E.. at Southbound I-81 On-Ramp | N/A | N/A | N/A | N/A |

**Table 5-12**
**2013 Existing Intersection Level of Service Analysis**

| ID | Intersection Name | 2013 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-126 | MLK Jr. E. at Northbound I-81 Off-Ramp | N/A | N/A | N/A | N/A |
| D-127 | State Route at New Connecting Rd. | N/A | N/A | N/A | N/A |
| D-128 | E Brighton at New Connecting Rd. | N/A | N/A | N/A | N/A |
| D-139 | Salina St. at SB I-81 Exit 19 Off-ramp | 34.1 | D | 3.4 | A |
| U-1 | N. Crouse Ave. at Burnet Ave. | 11.2 | B | 12.6 | B |
| U-4 | Westmoreland Ave. at Burnet Ave. | 13.9 | B | 21.0 | C |
| U-7 | Teall Ave. at Canal St. | 2.6 | A | 33.6 | D |
| U-10 | N./S. Crouse Ave. at Erie Blvd. E. | 12.5 | B | 12.4 | B |
| U-16 | Teall Ave. at Erie Blvd. E. | 30.8 | C | 49.9 | D |
| U-19 | S. Crouse Ave. at E. Water St. | 8.4 | A | 9.4 | A |
| U-24 | Irving Ave. at E. Fayette St. | 6.6 | A | 11.8 | B |
| U-25 | S. Crouse Ave. at E. Fayette St. | 11.3 | B | 13.5 | B |
| U-31 | Irving Ave. at NY 92/E. Genesee St. | 32.8 | C | 26.5 | C |
| U-32 | S. Crouse Ave. at NY 92/E. Genesee St. | 13.0 | B | 13.9 | B |
| U-41 | Sarah Loguen Dr. at Harrison St. | 15.5 | B | 16.1 | B |
| U-42 | Elizabeth Blackwell Dr. at Harrison St. | 1.6 | A | 1.8 | A |
| U-43 | Irving Ave. at Harrison St. | 24.4 | C | 18.8 | B |
| U-44 | S. Crouse Ave. at Harrison St. | 19.7 | B | 22.9 | C |
| U-51 | Irving Ave. at E. Adams St. | 12.7 | B | 21.3 | C |
| U-52 | S. Crouse Ave. at E. Adams St. | 9.2 | A | 14.9 | B |
| U-56 | Irving Ave. at Waverly Ave. | 13.1 | B | 15.4 | B |
| U-57 | S. Crouse Ave. at Waverly Ave. | 13.5 | B | 10.9 | B |
| U-58 | University Ave. at Waverly Ave. | 26.8 | C | 27.4 | C |
| U-62 | Irving Ave. at University Pl | 32.6 | C | 20.8 | C |
| U-63 | Irving Ave. at Van Buren St. | 38.8 | D | 16.3 | B |
| U-65 | Comstock Ave. at Euclid Ave. | 10.4 | B | 20.6 | C |
| U-67 | Comstock Ave. at Stratford St. | 8.8 | A | 8.4 | A |
| U-68 | Crouse Ave. at Westbound I-690 | N/A | N/A | N/A | N/A |
| U-69 | Crouse Ave. at Eastbound I-690 | N/A | N/A | N/A | N/A |
| U-70 | Irving Ave. at Erie Blvd. | N/A | N/A | N/A | N/A |
| U-71 | Irving Ave. at Water St. | N/A | N/A | N/A | N/A |
| W-1 | Southbound I-81 On-Ramp/Genant Dr. at Bear St. | 14.4 | B | 21.3 | C |
| W-3 | Southbound I-81 Off-Ramp/Genant Dr. at Spencer St. | 6.8 | A | 5.0 | A |
| W-4 | Solar St. at Hiawatha Blvd. W. | 30.2 | C | 45.6 | D |

**Table 5-12**
**2013 Existing Intersection Level of Service Analysis**

| ID | Intersection Name | 2013 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| W-5 | Spencer St. at Hiawatha Blvd. W. | 25.0 | C | 36.2 | D |
| W-6 | I-690 East Off-Ramp at Hiawatha Blvd. W. | 15.1 | B | 18.5 | B |
| W-9 | Spencer St. at Bear St./I-690 Ramps | 15.7 | B | 17.7 | B |
| W-12 | N. Geddes St. at Westbound I-690 Off-Ramp | 14.9 | B | 20.1 | C |
| W-13 | N. Geddes St. at Edison St. | 2.1 | A | 4.8 | A |
| W-15 | N. Geddes St. at NY 5/W. Genesee St. | 22.6 | C | 28.0 | C |
| W-17 | N. Geddes St. at Wilkinson St. | 2.1 | A | 5.5 | A |
| W-19 | N./S. Geddes St. at Erie Blvd. W. | 19.2 | B | 29.3 | C |
| W-20 | S. Geddes St. at W. Fayette St. | 18.2 | B | 28.3 | C |
| W-21 | S. Geddes St. at Marcellus St. | 1.0 | A | 1.1 | A |
| W-22 | S. Geddes St. at Otisco St. | 12.9 | B | 7.1 | A |
| W-23 | S. Geddes St. at Gifford St. | 12.3 | B | 5.7 | A |
| W-24 | S. Geddes St. at Seymour St. | 10.2 | B | 14.3 | B |
| W-25 | S. Geddes St. at Grand Ave./Shonnard St. | 15.7 | B | 4.0 | A |

**Note:** Intersection ID denotes the general location. D = Downtown, U = University Hill, and W = Westside and Lakefront

## Future No Build Alternative Level of Service and Mobility

*Freeway Level of Service*

The future No Build freeway LOS was determined by relating the VISSIM density calculations to the LOS criteria in **Table 5-9**. Levels of service were calculated for all the basic freeway segments, freeway ramps (ramp merge and diverge areas), and weaving areas within the Project Area (see **Appendix C-3)**. **Table 5-13 shows** the LOS analysis results for 2020 and 2050 No Build traffic conditions on selected critical sections of I-81, I-481, and I-690. Since traffic volumes on the project area roadways were assumed to increase moderately based on information generated by the SMTC regional travel demand model, 2020 and 2050 traffic conditions on I-81, I-481 and I-690 are expected to deteriorate slightly, in comparison to 2013 existing conditions. The analysis results indicate that vehicle densities on nearly all freeway segments would increase by 2020 and 2050.

**Table 5-13**
**2020 and 2050 No Build Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| **Northbound I-81** | | | | | | | | | |
| between Interchange 16A (I-481 North) off and on-ramps | BFS | 4.9 | A | 8.4 | A | 6.9 | A | 9.4 | A |
| between Interchange 17 (E. Colvin St) on-ramp and Exit 18 (Adams St) | BFS | 19.0 | C | 19.3 | C | 39.2 | E | 20.3 | C |
| between Westbound I-690 off and on-ramps | BFS | 14.1 | B | 27.7 | D | 15.0 | B | 31.2 | D |
| between Interchange 18 (Adams St, Harrison St) off and on-ramps | BFS | 21.5 | C | 23.6 | C | 22.9 | C | 24.4 | C |
| between Interchange 19 (Pearl St) and Interchange 20 (Butternut St) on-ramps | BFS | 11.4 | B | 27.4 | D | 11.9 | B | 29.6 | D |
| between Interchange 22 (Court St) off and on-ramps | BFS | 14.4 | B | 34.5 | D | 14.8 | B | 37.1 | E |
| between Interchange 23 (Park St, Hiawatha Blvd) off and on-ramps | BFS | 10.2 | A | 23.6 | C | 10.5 | A | 26.2 | D |
| between Exit 29S (I-481 SB) and Southbound NY 481 on-ramp | BFS | 8.9 | A | 21.2 | C | 10.1 | A | 24.9 | C |
| between Exit 29N (NY 481 NB) and Northbound I-481 on-ramp | BFS | 6.6 | A | 13.2 | B | 7.5 | A | 16.0 | B |
| at Exit 16A (I-481 North) | Diverge | 10.5 | B | 10.5 | B | 12.9 | B | 12.4 | B |
| at West I-690 off-ramp | Diverge | 13.8 | B | 27.2 | C | 14.7 | B | 30.3 | D |
| at Exit 18 (Adams St, Harrison St) | Diverge | 19.4 | B | 19.5 | B | 45.0 | F | 20.4 | C |
| at Exit 22 (Court St) | Diverge | 14.7 | B | 32.1 | D | 15.1 | B | 34.4 | D |
| at Exit 29S (I-481 South) | Diverge | 8.8 | A | 18.0 | B | 9.9 | A | 20.2 | C |
| at Interchange 17 (E. Colvin St) on-ramp | Merge | 15.6 | B | 16.4 | B | 22.8 | C | 17.2 | B |
| at Westbound I-690 on-ramp | Merge | 14.0 | B | 30.1 | D | 14.8 | B | 32.2 | D |
| at Interchange 19 (N. Salina St, Pearl St) on-ramp | Merge | 15.7 | B | 34.2 | D | 16.4 | B | 36.1 | E |
| at Interchange 20 (Butternut St) on-ramp | Merge | 14.2 | B | 33.4 | D | 14.8 | B | 37.1 | E |
| at Interchange 23 (Hiawatha Blvd) on-ramp | Merge | 14.3 | B | 27.7 | C | 15.4 | B | 30.6 | D |
| at Interchange 29S (I-481) on-ramp | Merge | 8.3 | A | 15.6 | B | 9.5 | A | 18.2 | B |
| between Interchange 18 (Harrison St) on-ramp and Eastbound I-690 off-ramp | Weave | 18.1 | B | 32.0 | D | 18.7 | B | 34.5 | D |
| between Interchange 22 (Court St) on-ramp and Exit 23 (Hiawatha Blvd) | Weave | 12.0 | B | 29.2 | D | 12.4 | B | 31.8 | D |
| between Interchange 29N (NY 481) on and off-ramps | Weave | 7.3 | A | 17.5 | B | 7.8 | A | 19.7 | B |
| **Southbound I-81** | | | | | | | | | |
| between Exit 29N (NY 481 NB) and Northbound I-481 on-ramp | BFS | 17.6 | B | 9.5 | A | 19.7 | C | 11.2 | B |
| between Exit 29S (I-481 SB) and Southbound NY 481 on-ramp | BFS | 56.8 | F | 24.2 | C | 75.2 | F | 28.1 | D |
| between Exits 23A and Old Liverpool Rd on-ramp | BFS | 21.1 | C | 11.5 | B | 22.7 | C | 12.6 | B |
| between Onondaga Lake Pkwy and Interchange 22 (Bear St) on-ramps | BFS | 53.0 | F | 22.2 | C | 93.2 | F | 23.3 | C |
| between Interchange 21 (Spencer/Catawba St) off and on-ramps | BFS | 36.9 | E | 16.3 | B | 128.4 | F | 17.5 | B |
| between Eastbound I-690 off and on-ramps | BFS | 55.0 | F | 28.8 | D | 28.3 | D | 31.1 | D |
| between Exit 18 (Harrison St, Adams St) and Westbound I-690 on-ramps | BFS | 18.6 | C | 23.5 | C | 18.2 | C | 24.7 | C |
| between Westbound I-690 and Interchange 18 (Adams St) on-ramps | BFS | 21.1 | C | 25.7 | C | 20.8 | C | 27.0 | D |
| between Interchange 18 (Adams St) and Exit 17 (S. State St) | BFS | 14.9 | B | 22.9 | C | 14.8 | B | 24.7 | C |
| between Interchange 16A (I-481) off and on-ramps | BFS | 10.0 | A | 14.8 | B | 10.3 | A | 16.8 | B |
| at Exit 29N (NY 481) | Diverge | 21.4 | C | 11.5 | B | 24.0 | C | 13.8 | B |

**Table 5-13**
**2020 and 2050 No Build Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| at Exit 21 (Spencer/Catawba St) | Diverge | 56.1 | F | 26.6 | C | 70.3 | F | 29.8 | D |
| at Exit 19 (Clinton St, Salina St) | Diverge | 65.2 | F | 23.5 | C | 51.6 | F | 26.0 | C |
| at Exit 18 (Harrison St, Adams St) | Diverge | 51.6 | F | 34.0 | D | 47.3 | F | 42.3 | F |
| at Exit to Eastbound I-690 | Diverge | 61.8 | F | 30.5 | D | 29.3 | D | 33.4 | D |
| at Exit 17 (S. State St, S. Salina St, Brighton Av) | Diverge | 14.4 | B | 19.3 | B | 14.3 | B | 20.4 | C |
| at Exit to Northbound I-481 off-ramp | Diverge | 6.4 | A | 12.4 | B | 6.5 | A | 14.2 | B |
| at Interchange 29N (NY 481) on-ramp | Merge | 25.2 | C | 15.5 | B | 26.2 | C | 16.6 | B |
| at Old Liverpool Rd on-ramp | Merge | 39.9 | E | 16.8 | B | 92.5 | F | 17.6 | B |
| at Onondaga Lake Pkwy (NY370) on-ramp | Merge | 38.7 | E | 18.9 | B | 90.9 | F | 19.7 | B |
| at Interchange 22 (Bear St) on-ramp | Merge | 46.2 | F | 22.2 | C | 71.5 | F | 24.3 | C |
| at Westbound I-690 on-ramp | Merge | 16.5 | B | 20.7 | C | 16.4 | B | 21.8 | C |
| at Eastbound I-690 on-ramp | Merge | 83.3 | F | 20.8 | C | 69.5 | F | 26.9 | C |
| at Interchange 18 (Harrison St, Adams St) on-ramp | Merge | 14.6 | B | 23.0 | C | 14.6 | B | 25.0 | C |
| at Interchange 16A (I-481) on-ramp | Merge | 9.3 | A | 14.0 | B | 9.7 | A | 15.6 | B |
| between Interchange 29S (I-481) on and off-ramps | Weave | 18.1 | B | 9.1 | A | 20.7 | C | 10.9 | B |
| between Interchange 21 (Spencer/Catawba St) on-ramp and Exit 20 (Franklin St) | Weave | 47.8 | F | 19.9 | B | 53.7 | F | 23.4 | C |
| **Northbound I-481** | | | | | | | | | |
| between Interchange 1 (Brighton Av, Rock Cut Rd) off and on-ramps | BFS | 7.2 | A | 8.5 | A | 7.5 | A | 9.4 | A |
| between Interchange 3E (East NY 5) off and on-ramps | BFS | 13.0 | B | 10.5 | A | 14.0 | B | 11.8 | B |
| between Interchange 3W (West NY 5) off and on-ramps | BFS | 13.0 | B | 11.6 | B | 13.9 | B | 12.8 | B |
| between Interchange 3W (West NY 5) on-ramp and Exit 4 (West I-690) | BFS | 19.3 | C | 15.4 | B | 21.2 | C | 16.4 | B |
| between Interchange 4 (West I-690) off-ramp and Interchange 4 (East I-690) on-ramp | BFS | 18.6 | C | 24.7 | C | 20.8 | C | 26.6 | D |
| between Interchange 4 (East I-690) on-ramp and Exit 5E (Kirkville Rd) | BFS | 12.2 | B | 12.4 | B | 13.8 | B | 13.6 | B |
| between Interchange 5E (Kirkville Rd) off and on-ramps | BFS | 17.3 | B | 21.1 | C | 19.0 | C | 22.2 | C |
| between Interchange 5W (Kirkville Rd) off and on-ramps | BFS | 12.9 | B | 20.0 | C | 14.3 | B | 21.2 | C |
| between Interchange 5W (Kirkville Rd) on-ramp and Exit 6 (I-90) | BFS | 14.7 | B | 22.6 | C | 16.5 | B | 24.6 | C |
| between Interchange 9N (I-81) off and on-ramps | BFS | 7.1 | A | 15.4 | B | 7.1 | A | 16.6 | B |
| between Interchange 9S (I-81) off and on-ramps | BFS | 9.4 | A | 27.1 | D | 9.9 | A | 28.9 | D |
| at Exit 3E (East NY 5) | Diverge | 10.7 | B | 9.1 | A | 11.2 | B | 10.2 | B |
| at Exit 4 (West I-690) | Diverge | 15.4 | B | 13.1 | B | 16.9 | B | 14.0 | B |
| at Exit 5E (Kirkville Rd) | Diverge | 13.5 | B | 20.8 | C | 15.8 | B | 23.4 | C |
| at Exit 9N (I-81) | Diverge | 7.7 | A | 17.4 | B | 8.2 | A | 19.2 | B |
| at Interchange 1 (Brighton Av, Rock Cut Rd) on-ramp | Merge | 9.0 | A | 8.9 | A | 9.6 | A | 9.8 | A |
| at Interchange 3W (West NY 5) on-ramp | Merge | 17.6 | B | 15.1 | B | 20.0 | C | 16.0 | B |
| at Interchange 4 (East I-690) on-ramp | Merge | 12.8 | B | 17.6 | B | 14.4 | B | 19.1 | B |
| at Interchange 5W (Kirkville Rd) on-ramp | Merge | 9.9 | A | 14.8 | B | 11.1 | B | 16.1 | B |
| at Interchange 9S (I-81) on-ramp | Merge | 7.1 | A | 18.6 | B | 7.4 | A | 19.9 | B |

**Table 5-13**
**2020 and 2050 No Build Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| between I-81 on-ramp and Exit 1 (Brighton Av, Rock Cut Rd) | Weave | 5.7 | A | 8.2 | A | 5.9 | A | 9.5 | A |
| between Interchange 3E (East NY 5) on-ramp and Exit 3W (West NY 5) | Weave | 10.5 | B | 9.5 | A | 11.1 | B | 10.4 | B |
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 5W (Kirkville Rd) | Weave | 12.8 | B | 16.4 | B | 14.0 | B | 17.3 | B |
| between Interchange 9N (I-81) on-ramp and Exit 9S (I-81) | Weave | 8.7 | A | 23.7 | C | 8.7 | A | 25.2 | C |
| **Southbound I-481** | | | | | | | | | |
| between Interchange 9S (I-81) off and on-ramps | BFS | 14.2 | B | 8.7 | A | 19.9 | C | 11.6 | B |
| between Interchange 9N (I-81) off and on-ramps | BFS | 19.9 | C | 10.2 | A | 29.0 | D | 15.0 | B |
| between Interchange 6 (I-90) on-ramp and Exit 5W (Kirkville Rd) | BFS | 21.3 | C | 18.0 | B | 24.0 | C | 19.8 | C |
| between Interchange 5W (Kirkville Rd) off and on-ramps | BFS | 18.3 | C | 16.5 | B | 20.6 | C | 18.2 | C |
| between Interchange 5E (Kirkville Rd) off and on-ramps | BFS | 19.4 | C | 15.6 | B | 22.1 | C | 17.9 | B |
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 4 (West I-690) | BFS | 22.9 | C | 20.5 | C | 25.8 | C | 23.1 | C |
| between Interchange 4 (I-690) off and on-ramps | BFS | 10.7 | A | 12.4 | B | 12.1 | B | 14.0 | B |
| between Interchange 4 (East I-690) on-ramp and Exit 3W (West NY 5) | BFS | 11.2 | B | 19.5 | C | 12.3 | B | 20.7 | C |
| between Interchange 3W (West NY 5) off and on-ramps | BFS | 9.9 | A | 17.8 | B | 10.9 | A | 18.6 | C |
| between Interchange 3E (East NY 5) off and on-ramps | BFS | 6.6 | A | 8.9 | A | 7.7 | A | 9.8 | A |
| between Northbound I-81 off-ramp and E. Brighton Av on-ramp | BFS | 12.0 | B | 4.1 | A | 14.3 | B | 5.2 | A |
| at Exit 9S (I-81) | Diverge | 20.7 | C | 12.1 | B | 29.9 | D | 16.6 | B |
| at Exit 5W (Kirkville Rd) | Diverge | 15.5 | B | 12.4 | B | 17.2 | B | 13.7 | B |
| at Exit 4 (West I-690) | Diverge | 26.2 | C | 20.7 | C | 30.3 | D | 23.8 | C |
| at Exit 3W (West NY 5) | Diverge | 10.3 | B | 18.7 | B | 11.2 | B | 19.5 | B |
| at Exit 1 (Brighton Av) | Diverge | 10.2 | B | 11.3 | B | 11.9 | B | 12.1 | B |
| at Northbound I-81 and Southbound I-81 ramps | Diverge | 10.2 | B | 9.1 | A | 11.7 | B | 10.1 | B |
| at Interchange 9N (I-81) on-ramp | Merge | 16.3 | B | 8.6 | A | 21.4 | C | 10.3 | B |
| at Interchange 5E (Kirkville Rd) on-ramp | Merge | 15.8 | B | 14.5 | B | 17.7 | B | 16.4 | B |
| at Interchange 4 (East I-690) on-ramp | Merge | 10.3 | B | 19.8 | B | 11.1 | B | 20.8 | C |
| at Interchange 3E (East NY 5) on-ramp | Merge | 7.0 | A | 10.5 | B | 8.1 | A | 11.2 | B |
| at E. Brighton Av on-ramp | Merge | 15.9 | B | 8.3 | A | 18.2 | B | 9.4 | A |
| between Interchange 9S (I-81) on-ramp and Exit 9N (I-81) | Weave | 15.3 | B | 8.5 | A | 20.6 | C | 11.3 | B |
| between Interchange 5W (Kirkville Rd) on-ramp and Exit 5E (Kirkville Rd) | Weave | 15.0 | B | 12.4 | B | 17.4 | B | 14.4 | B |
| between Interchange 3W (West NY 5) on-ramp and Exit 3E (East NY 5) | Weave | 9.2 | A | 19.2 | B | 10.3 | B | 21.0 | C |
| **Eastbound I-690** | | | | | | | | | |
| between Exit 8 (Hiawatha Blvd) and Exit 9 (Bear St) | BFS | 27.7 | D | 11.4 | B | 30.2 | D | 13.2 | B |
| between Exit 9 (Bear St) and Interchange 10 (N. Geddes St) on-ramp | BFS | 30.8 | D | 10.0 | A | 29.6 | D | 11.4 | B |
| between Interchange 11 (West St) off and on-ramps | BFS | 60.1 | F | 22.5 | C | 44.9 | E | 24.9 | C |
| between Southbound I-81 off and on-ramps | BFS | 22.2 | C | 22.4 | C | 23.6 | C | 23.4 | C |
| between Northbound I-81 on-ramp and Exit 14 (Teall Av) | BFS | 26.7 | D | 30.4 | D | 27.6 | D | 31.3 | D |
| between Interchange 14 (Teall Av) off and on-ramp | BFS | 18.1 | C | 23.2 | C | 18.4 | C | 23.7 | C |

**Table 5-13**
**2020 and 2050 No Build Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| at Exit 8 (Hiawatha Blvd) | Diverge | 22.6 | C | 13.9 | B | 24.8 | C | 15.4 | B |
| at Exit 9 (Bear St) | Diverge | 25.0 | C | 10.9 | B | 28.1 | D | 12.5 | B |
| at Southbound I-81 off-ramp | Diverge | 59.0 | F | 33.1 | D | 47.2 | F | 36.0 | E |
| at Exit 14 (Teall Ave) off-ramp | Diverge | 21.4 | C | 22.9 | C | 22.7 | C | 23.5 | C |
| at Interchange 11 (West St) on-ramp | Merge | 57.4 | F | 23.9 | C | 48.7 | F | 26.6 | C |
| at Southbound I-81 on-ramp | Merge | 20.4 | C | 22.7 | C | 21.3 | C | 23.6 | C |
| at N. McBride St on-ramp | Merge | 20.3 | C | 30.9 | D | 20.9 | C | 33.1 | D |
| at Northbound I-81 on-ramp | Merge | 26.3 | C | 32.2 | D | 25.3 | C | 34.9 | D |
| at Interchange 14 (Teall Ave) on-ramp | Merge | 18.4 | B | 23.3 | C | 18.4 | B | 23.7 | C |
| between Interchange 10 (N. Geddes St) on-ramp and Exit 11 (West St) | Weave | 39.7 | E | 12.5 | B | 31.0 | D | 13.8 | B |
| **Westbound I-690** | | | | | | | | | |
| between Interchange 14 (Teall Av) off and on-ramps | BFS | 18.8 | C | 22.2 | C | 20.7 | C | 22.4 | C |
| between Interchange 14 (Teall Av) and Southbound I-81 off-ramp | BFS | 24.4 | C | 30.7 | D | 28.3 | D | 31.5 | D |
| between Exit 13 (Townsend St) and Northbound I-81 off-ramp | BFS | 16.2 | B | 12.1 | B | 17.7 | B | 13.1 | B |
| between Northbound I-81 off and on-ramps | BFS | 15.8 | B | 26.4 | D | 17.5 | B | 28.1 | D |
| between Interchange 11 (West St) off and on-ramps | BFS | 13.2 | B | 23.3 | C | 13.7 | B | 25.1 | C |
| between Exit 10 (N. Geddes St) and Interchange 9 (Bear St) on-ramp | BFS | 8.4 | A | 19.7 | C | 9.6 | A | 22.2 | C |
| between Interchange 9 (Bear St) and Interchange 8 (State Fair Blvd) on-ramps | BFS | 11.3 | B | 25.9 | C | 12.9 | B | 29.2 | D |
| at Exit 14 (Teall Ave) off-ramp | Diverge | 18.2 | B | 20.9 | C | 19.7 | B | 21.6 | C |
| at Southbound I-81 off-ramp | Diverge | 24.7 | C | 25.2 | C | 23.9 | C | 24.0 | C |
| at Exit 13 (Townsend St) | Diverge | 48.7 | F | 22.4 | C | 31.5 | D | 23.4 | C |
| at North I-81 off-ramp | Diverge | 12.6 | B | 23.6 | C | 13.6 | B | 25.5 | C |
| at Exit 11 (West St) off-ramp | Diverge | 20.9 | C | 32.0 | D | 22.8 | C | 34.9 | D |
| at Exit 14 (Teall Ave) on-ramp | Merge | 23.7 | C | 31.7 | D | 31.5 | D | 27.8 | C |
| at Northbound I-81 on-ramp | Merge | 14.4 | B | 25.3 | C | 15.8 | B | 29.4 | D |
| at Interchange 9 (Bear St) on-ramp | Merge | 11.9 | B | 25.5 | C | 13.4 | B | 31.4 | D |
| at Interchange 8 (Hiawatha Blvd) on-ramp | Merge | 12.1 | B | 24.0 | C | 13.4 | B | 26.3 | C |
| between Interchange 11 (West St) on-ramp and Exit 10 (N. Geddes St) | Weave | 9.5 | A | 19.1 | B | 10.5 | B | 21.1 | C |

The freeway segments that would operate at LOS E or worse under 2020 and/or 2050 No Build conditions include:

- Northbound I-81 between the Interchange 17 (E. Colvin Street) on-ramp and Exit 18 (Adams Street) (2050 AM peak hour);
- Northbound I-81 between the Interchange 22 (Court Street) off- and on-ramps (2050 PM peak hours),
- Southbound I-81 between the eastbound I-690 off- and on-ramps (2020 AM peak hour);

- Southbound I-81 between the Interchange 21 (Spencer Street/Catawba Street) off- and on- ramps (2020/2050 AM peak hours)
- Southbound I-81 between Onondaga Lake Parkway and the Interchange 22 (Bear Street) on-ramps (2020/2050 AM peak hours)
- Southbound I-81 between Exit 29S (I-481 SB) and Southbound NY 481 on-ramp (2020/2050 AM peak hours)
- Eastbound I-690 between the Interchange 11 (West Street) off- and on-ramps (2020/2050 AM peak hours)
- Northbound I-81 at Interchange 19 (N. Salina St, Pearl St) on-ramp (2050 PM peak hour)
- Northbound I-81 at the Interchange 20 (Butternut Street) on-ramp (2050 PM peak hour)
- Southbound I-81 at the eastbound I-690 on-ramp (2020/2050 AM peak hours)
- Southbound I-81 at the Interchange 22 (Bear Street) on-ramp (2020/2050 AM peak hours)
- Southbound I-81 at the Old Liverpool Road on-ramp (2020/2050 AM peak hours)
- Southbound I-81 at the Onondaga Lake Parkway on-ramp (2020/2050 AM peak hours)
- Eastbound I-690 at the Interchange 11 (West Street) on-ramp (2020/2050 AM peak hours)
- Northbound I-81 at Exit 18 (Adams Street/Harrison Street) (2050 AM peak hour)
- Southbound I-81 at eastbound I-690 (2020 AM peak hour);
- Southbound I-81 at Exit 18 (Harrison Street/Adams Street) (2020/2050 AM peak hours and 2050 PM peak hour)
- Southbound I-81 at Exit 19 (Clinton Street/Salina Street) (2020/2050 AM peak hours)
- Southbound I-81 at Exit 21 (Spencer Street/Catawba Street) (2020/2050 AM peak hours)
- Eastbound I-690 at the southbound I-81 off-ramp (2020/2050 AM peak hours and 2050 PM peak hour)
- Westbound I-690 at Exit 13 (Townsend Street) (2020 AM peak hour)
- Southbound I-81 between the Interchange 21 (Spencer Street/Catawba Street) on-ramp and Exit 20 (Franklin Street) (2020/2050 AM peak hours).
- Eastbound I-690 between the Interchange 10 (N. Geddes Street) on-ramp and Exit 11 (West Street) (2020 AM peak hour).

*Intersection Level of Service*

Based on VISSIM delay calculation, **Table 5-14** summarizes the LOS for the 2020 and 2050 No Build conditions for selected signalized and unsignalized intersections during the weekday AM and PM peak hours (More detailed LOS analyses for 260 intersections are included in **Appendix C-3)**. As expected, the delay at most intersections would increase because of the projected increase in traffic volumes for the future years. Of the 98 intersections (Note: The other 15 intersections are reserved for Viaduct and Community Grid Alternatives), five intersections would operate unacceptably (LOS E or F) during the AM peak hour in both 2020

and 2050; and five and eight intersections would operate unacceptably during the PM peak hour in 2020 and 2050, respectively. The following is a summary of locations that would operate at LOS E or F:

- Intersection D-32 – Salina Street and Herald Place (2020 AM peak hour)
- Intersection D-33 – Salina Street and Willow Street (2020 AM peak hour)
- Intersection D-73 – State Street and Washington Street (2050 PM peak hour)
- Intersection D-108 – Almond Street and Adams Street (2050 AM peak hour)
- Intersection D-110 – Almond Street and Van Buren Street (2050 AM peak hour)
- Intersection D-139 – Salina Street and Southbound I-81 Exit 20 on-ramp (2050 AM peak hour).
- Intersection U-4 – Westmoreland Avenue and Burnet Avenue (2050 PM peak hour)
- Intersection U-56 – Irving Avenue and Waverly Avenue (2020 PM peak hour).
- Intersection U-67 – Comstock Avenue and Stratford Street (2020/2050 AM peak hours and 2050 PM peak hour)
- Intersection W-4 – Solar Street and Hiawatha Boulevard (2050 PM peak hour)
- Intersection W-5 – Spencer Street and Hiawatha Boulevard (2020/2050 PM peak hours)
- Intersection W-6 – I-690 East off-ramp and Hiawatha Boulevard (2020 PM peak hour)
- Intersection W-15 – Geddes Street and NY 5/Genesee Street (2020 and 2050 PM peak hours).

Most of the deficient operations at these intersections are caused by the failure in one or more of the approach movements. Generally, the high traffic demand, in particular the left turn movement, would lead to the failure of the entire intersection by blocking the through movement on the same intersection approach.

**Table 5-14**
**2020 and 2050 No Build Alternative Intersection Level of Service Analysis**

| | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| ID | Intersection Name | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West St. at NY 5/W. Genesee St. | 33.6 | C | 22.7 | C | 25.9 | C | 6.1 | A |
| D-10 | Wallace St. at NY 5/W. Genesee St. | 18.3 | B | 14.4 | B | 34.3 | C | 7.4 | A |
| D-11 | N. Franklin St. /Butternut St. at N. Franklin St. | 7.4 | A | 10.4 | B | 7.8 | A | 12.9 | B |
| D-12 | N. Franklin St. at Herald Pl | 13.4 | B | 15.4 | B | 12.2 | B | 10.5 | B |
| D-13 | N. Franklin St. at NY 5/W. Genesee St. | 19.3 | B | 24.9 | C | 23.9 | C | 21.1 | C |
| D-19 | N. Clinton St. at Webster Landing | 0.3 | A | 0.8 | A | 0.3 | A | 0.2 | A |
| D-21 | N. Clinton St. at NY 5/W. Genesee St. | 21.5 | C | 37.0 | D | 22.5 | C | 15.6 | B |
| D-24 | S. Clinton St. at W. Washington St. | 14.3 | B | 16.1 | B | 7.2 | A | 9.8 | A |

**Table 5-14**
**2020 and 2050 No Build Alternative Intersection Level of Service Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-25 | S. Clinton St. at W. Fayette St. | 17.0 | B | 5.9 | A | 10.6 | B | 10.2 | B |
| D-27 | S. Clinton St. at W. Onondaga St. | 17.0 | B | 17.7 | B | 12.7 | B | 10.5 | B |
| D-28 | S. Clinton St. at W. Adams St. | 9.5 | A | 14.4 | B | 8.6 | A | 17.6 | B |
| D-32 | N. Salina St. at Herald Pl | 65.9 | E | 19.8 | B | 26.2 | C | 27.7 | C |
| D-33 | N. Salina St. at E./W. Willow St. | 68.0 | E | 6.9 | A | 40.7 | D | 6.2 | A |
| D-34 | N. Salina St. at NY 5/W. Genesee St./James St. | 15.2 | B | 16.2 | B | 15.7 | B | 11.5 | B |
| D-36 | S. Salina St. at E./W. Washington St. | 15.0 | B | 11.2 | B | 15.3 | B | 18.0 | B |
| D-37 | S. Salina St. at E./W. Fayette St. | 16.6 | B | 7.2 | A | 14.2 | B | 10.0 | B |
| D-39 | S. Salina St. at Harrison St. and Onondaga St. | 27.8 | C | 28.3 | C | 28.9 | C | 43.8 | D |
| D-40 | S. Salina St. at E./W. Adams St. | 37.0 | D | 24.6 | C | 19.4 | B | 38.0 | D |
| D-46 | Pearl St. at Hickory St. | 5.2 | A | 4.1 | A | 5.1 | A | 6.5 | A |
| D-47 | Pearl St. at E. Willow St. | 0.6 | A | 1.0 | A | 0.5 | A | 1.2 | A |
| D-48 | N. Warren St. at E. Willow St. | 2.6 | A | 10.9 | B | 4.6 | A | 4.6 | A |
| D-49 | N. Warren St. at NY 5/James St. | 12.1 | B | 20.0 | C | 5.2 | A | 6.8 | A |
| D-50 | N. Warren St. at E. Erie Blvd. | 1.5 | A | 1.8 | A | 1.8 | A | 0.8 | A |
| D-56 | S. Warren St. at Harrison St. | 20.6 | C | 15.8 | B | 11.8 | B | 40.1 | D |
| D-57 | S. Warren St. at E. Adams St. | 6.5 | A | 11.8 | B | 8.4 | A | 9.7 | A |
| D-58 | Oswego Blvd. at James St. | 27.4 | C | 28.9 | C | 4.1 | A | 13.1 | B |
| D-59 | NY 5/Oswego Blvd./ at Montgomery St. | 9.0 | A | 10.0 | A | 5.7 | A | 14.2 | B |
| D-66 | Montgomery St. at Harrison St. | 5.3 | A | 13.6 | B | 6.5 | A | 9.4 | A |
| D-67 | Montgomery St. at E. Adams St. | 7.3 | A | 14.1 | B | 7.9 | A | 12.1 | B |
| D-68 | US 11/N. State St. at Hickory St. | 1.5 | A | 3.1 | A | 1.6 | A | 3.5 | A |
| D-69 | US 11/N. State St. at E. Willow St. | 8.7 | A | 14.2 | B | 13.7 | B | 15.0 | B |
| D-71 | US 11/S. State St. at NY 5/Erie Blvd. E. | 32.8 | C | 22.7 | C | 42.5 | D | 19.0 | B |
| D-73 | US 11/S. State St. at E. Washington St. | 14.5 | B | 13.2 | B | 11.4 | B | 61.3 | E |
| D-78 | US 11/S. State St. at Harrison St. | 18.0 | B | 11.3 | B | 8.6 | A | 17.6 | B |
| D-79 | US 11/S. State St. at E. Adams St. | 9.2 | A | 15.2 | B | 6.7 | A | 12.9 | B |
| D-83 | N. Townsend St. at Westbound I-690 Off-ramp | 40.3 | D | 15.1 | B | 25.6 | C | 15.7 | B |
| D-84 | N./S. Townsend St. at NY 5/Erie Blvd. E. | 15.1 | B | 25.6 | C | 20.2 | C | 14.0 | B |
| D-86 | S. Townsend St. at E. Washington St. | 13.3 | B | 15.5 | B | 5.9 | A | 11.3 | B |
| D-87 | S. Townsend St. at E. Fayette St. | 28.7 | C | 16.4 | B | 8.3 | A | 12.7 | B |
| D-88 | S. Townsend St. at NY 92/E. Genesee St. | 10.5 | B | 18.0 | B | 9.6 | A | 11.5 | B |
| D-89 | S. Townsend St. at Harrison St. | 15.5 | B | 17.4 | B | 13.7 | B | 13.1 | B |

**Table 5-14**
**2020 and 2050 No Build Alternative Intersection Level of Service Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-90 | S. Townsend St. at E. Adams St. | 26.6 | C | 39.0 | D | 25.9 | C | 23.3 | C |
| D-92 | N. McBride St. at EB I-690 On-ramp | 1.1 | A | 2.0 | A | 1.5 | A | 3.5 | A |
| D-93 | N./S. McBride St. at NY 5/Erie Blvd. E. | 16.7 | B | 32.0 | C | 10.8 | B | 20.1 | C |
| D-99 | Catherine St. at Burnet Ave. | 1.1 | A | 0.6 | A | 15.1 | B | 12.2 | B |
| D-100 | Almond St./Catherine St. at NY 5/Erie Blvd. E. | 8.2 | A | 5.3 | A | 8.6 | A | 12.3 | B |
| D-101 | Almond St. at E. Water St. | 21.5 | C | 23.8 | C | 8.5 | A | 8.8 | A |
| D-102 | Almond St. at E. Washington St. | 17.9 | B | 12.9 | B | 6.0 | A | 7.1 | A |
| D-103 | Almond St. at E. Fayette St. | 16.1 | B | 14.9 | B | 7.7 | A | 13.8 | B |
| D-104 | Almond St. at NY 92/E. Genesee St. | 21.9 | C | 21.7 | C | 19.1 | B | 20.9 | C |
| D-105 | Almond St. at Southbound I-81 Off-Ramp | 15.7 | B | 23.4 | C | 17.1 | B | 11.6 | B |
| D-106 | Harrison St. at Southbound I-81 Off-Ramp | 1.3 | A | 0.6 | A | 1.5 | A | 0.6 | A |
| D-107 | Almond St. at Harrison St. | 34.5 | C | 36.1 | D | 36.1 | D | 25.3 | C |
| D-108 | Almond St. at E. Adams St. | 47.5 | D | 37.1 | D | 61.6 | E | 33.5 | C |
| D-109 | Almond St. at Burt St. | 15.9 | B | 13.4 | B | 30.5 | C | 27.6 | C |
| D-110 | Almond St. at Van Buren St. | 5.2 | A | 4.1 | A | 100.7 | F | 7.7 | A |
| D-116 | Midland Ave. at W. MLK Jr. | 2.8 | A | 7.6 | A | 1.5 | A | 4.8 | A |
| D-118 | West St. at Westbound I-690 Ramps | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-119 | West St. at Eastbound I-690 Ramps | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-120 | Southbound I-81 Off-ramp and Willow St. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-121 | Pearl St. at James St. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-122 | Almond St. and MLK Jr. E. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-123 | Catherine St. at Westbound I-690 Off-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-124 | Catherine St. at Eastbound I-690 On-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-125 | MLK Jr. E. at Southbound I-81 On-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-126 | MLK Jr. E. at Northbound I-81 Off-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-127 | State Route at New Connecting Rd. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-128 | E Brighton at New Connecting Rd. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-139 | Salina St. at SB I-81 Exit 19 Off-ramp | 17 | B | 3.8 | A | 53.7 | F | 4.1 | A |
| U-1 | N. Crouse Ave. at Burnet Ave. | 0.3 | A | 0.9 | A | 11.2 | B | 13.9 | B |
| U-4 | Westmoreland Ave. at Burnet Ave. | 13.1 | B | 22.9 | C | 17.2 | C | 42.4 | E |
| U-7 | Teall Ave. at Canal St. | 1.7 | A | 3.5 | A | 1.8 | A | 38.6 | D |
| U-10 | N./S. Crouse Ave. at Erie Blvd. E. | 12.4 | B | 12.3 | B | 12.3 | B | 12.5 | B |
| U-16 | Teall Ave. at Erie Blvd. E. | 45.0 | D | 47.4 | D | 45.1 | D | 51.7 | D |

**Table 5-14**
**2020 and 2050 No Build Alternative Intersection Level of Service Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| U-19 | S. Crouse Ave. at E. Water St. | 8.6 | A | 10.2 | B | 9.0 | A | 10.3 | B |
| U-24 | Irving Ave. at E. Fayette St. | 7.1 | A | 11.5 | B | 8.3 | A | 11.3 | B |
| U-25 | S. Crouse Ave. at E. Fayette St. | 11.0 | B | 13.7 | B | 7.6 | A | 15.2 | B |
| U-31 | Irving Ave. at NY 92/E. Genesee St. | 39.6 | D | 38.4 | D | 25.5 | C | 24.8 | C |
| U-32 | S. Crouse Ave. at NY 92/E. Genesee St. | 5.4 | A | 13.2 | B | 17.1 | B | 12.6 | B |
| U-41 | Sarah Loguen Dr. at Harrison St. | 14.5 | B | 32.3 | C | 15.1 | B | 22.9 | C |
| U-42 | Elizabeth Blackwell Dr. at Harrison St. | 1.1 | A | 2.5 | A | 1.2 | A | 2.8 | A |
| U-43 | Irving Ave. at Harrison St. | 26.6 | C | 22.3 | C | 26.0 | C | 24.7 | C |
| U-44 | S. Crouse Ave. at Harrison St. | 18.7 | B | 51.3 | D | 13.8 | B | 20.9 | C |
| U-51 | Irving Ave. at E. Adams St. | 11.1 | B | 19.7 | B | 19.1 | B | 17.4 | B |
| U-52 | S. Crouse Ave. at E. Adams St. | 11.2 | B | 16.5 | B | 14.5 | B | 15.9 | B |
| U-56 | Irving Ave. at Waverly Ave. | 14.9 | B | 61.0 | E | 16.7 | B | 16.0 | B |
| U-57 | S. Crouse Ave. at Waverly Ave. | 18.3 | B | 32.7 | C | 15.9 | B | 8.9 | A |
| U-58 | University Ave. at Waverly Ave. | 30.6 | C | 28.6 | C | 26.7 | C | 32.4 | C |
| U-62 | Irving Ave. at University Pl | 26.4 | C | 22.8 | C | 38.8 | D | 28.0 | C |
| U-63 | Irving Ave. at Van Buren St. | 20.7 | C | 17.2 | B | 47.8 | D | 22.2 | C |
| U-65 | Comstock Ave. at Euclid Ave. | 15.3 | C | 19.7 | B | 22.3 | C | 32.7 | C |
| U-67 | Comstock Ave. at Stratford St. | 42.7 | E | 27.2 | D | 53.0 | F | 44.5 | E |
| U-68 | Crouse Ave. at Westbound I-690 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-69 | Crouse Ave. at Eastbound I-690 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-70 | Irving Ave. at Erie Blvd. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-71 | Irving Ave. at Water St. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| W-1 | Southbound I-81 On-Ramp/Genant Dr. at Bear St. | 34.3 | C | 21.7 | C | 14.2 | B | 16.1 | B |
| W-3 | Southbound I-81 Off-Ramp/Genant Dr. at Spencer St. | 5.7 | A | 5.1 | A | 6.0 | A | 4.6 | A |
| W-4 | Solar St. at Hiawatha Blvd. W. | 22.1 | C | 31.4 | C | 21.7 | C | 84.2 | F |
| W-5 | Spencer St. at Hiawatha Blvd. W. | 24.3 | C | 72.5 | E | 26.8 | C | 68.8 | E |
| W-6 | I-690 East Off-Ramp at Hiawatha Blvd. W. | 14.5 | B | 183.6 | F | 15.2 | B | 30.9 | C |
| W-9 | Spencer St. at Bear St./I-690 Ramps | 15.1 | B | 16.4 | B | 16.0 | B | 17.0 | B |
| W-12 | N. Geddes St. at Westbound I-690 Off-Ramp | 14.9 | B | 22.7 | C | 14.8 | B | 21.9 | C |
| W-13 | N. Geddes St. at Edison St. | 2.5 | A | 4.0 | A | 2.5 | A | 5.7 | A |
| W-15 | N. Geddes St. at NY 5/W. Genesee St. | 25.2 | C | 64.9 | E | 24.6 | C | 67.1 | E |
| W-17 | N. Geddes St. at Wilkinson St. | 2.8 | A | 4.4 | A | 2.9 | A | 12.4 | B |
| W-19 | N./S. Geddes St. at Erie Blvd. W. | 42.7 | D | 43.2 | D | 45.4 | D | 47.6 | D |

**Table 5-14**
**2020 and 2050 No Build Alternative Intersection Level of Service Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| W-20 | S. Geddes St. at W. Fayette St. | 39.4 | D | 30.0 | C | 43.9 | D | 39.5 | D |
| W-21 | S. Geddes St. at Marcellus St. | 5.5 | A | 1.6 | A | 5.0 | A | 6.5 | A |
| W-22 | S. Geddes St. at Otisco St. | 13.1 | B | 11.5 | B | 12.3 | B | 13.1 | B |
| W-23 | S. Geddes St. at Gifford St. | 13.2 | B | 6.0 | A | 13.3 | B | 6.8 | A |
| W-24 | S. Geddes St. at Seymour St. | 10.3 | B | 14.5 | B | 11.7 | B | 15.2 | B |
| W-25 | S. Geddes St. at Grand Ave./Shonnard St. | 16.0 | B | 3.9 | A | 15.9 | B | 3.8 | A |

**Note:** Intersection ID denotes the general location. D = Downtown, U = University Hill, and W = Westside and Lakefront

## Safety Considerations, Accident History and Analysis

*Existing Safety Considerations, Accident History, and Analysis*

An accident analysis was performed in accordance with the Highway Design Manual Chapter 5 using police accident reports compiled from NYSDOT for the for the three-year period, from July 1, 2010 through June 30, 2013. The accident history was analyzed for I-81 from Interchange 16A to Interchange 29, I-690 from Interchange 9 to the I-481 interchange, and I-481 between the southern and northern interchanges with I-81.

Accident summaries and individual accident details can be reviewed in **Appendix C-4.**

*I-81*

Accident records are assigned to Reference Markers, which are signs installed roughly every one-tenth of a mile on highways and used by NYSDOT and police to monitor traffic and identify high-accident locations. Totally 1,306 accidents occurred on I-81 limits from Reference Marker (RM) 81I 3303 2006 to RM 81I 3303 3066.

Of the 1,306 documented accidents in the project area, approximately 267 (20 percent) accidents were personal-injury accidents and 1,032 (79 percent) accidents were property damage only accidents. There were five non-reportable accidents and two fatalities.

The predominant accident types within the project limits are rear-end (31 percent), fixed-object (30 percent), and overtaking (24 percent) accidents, which account for 85 percent of the total crashes. There were 163 reported crashes (7 percent) involving commercial vehicles and the remaining accidents involved passenger vehicles only (93 percent).

Major factors contributing to the accidents on I-81 are poor driver judgment/behavior and aggressive driving. Unsafe speed (342 accidents), following too closely (358 accidents), unsafe lane changing (200 accidents), and driver inattention (187 accidents) were identified in a large number of the accidents as the primary contributing factors. In addition, slippery pavement (276 accidents) was also an important contributing factor for the accidents.

*I-690*

Accident records documented 843 accidents occurring within the I-690 limits from RM 690I 3301 2002 to RM 690I 3301 3016. Of the 843 documented accidents in the project area, approximately 175 (21 percent) accidents were personal-injury accidents and 665 (79 percent) accidents were property damage only accidents. There were three non-reportable accidents and no fatalities.

The predominant accident types within the project limits are fixed object (36 percent), rear-end (30 percent, and overtaking (22 percent) accidents, which account for 88 percent of the total crashes. There were 64 reported crashes (4 percent) involving commercial vehicles and the remaining accidents involved passenger vehicles only (96 percent).

Major factors contributing to the accidents on I-690 are poor driving behavior and aggressive driving, such as unsafe speed (253 accidents) and driver inattention (168 accidents). Factors such as following too closely (214 accidents), unsafe lane changing (115 accidents), passing or lane usage improper (79 accidents), and reaction to other uninvolved vehicle (73 accidents) typically are associated with traffic congestion, – either generally along the roadway or localized on- and off-ramps. Many ramps in the Project Area have nonstandard acceleration, deceleration, and auxiliary lane lengths, and/or spacing.

*Interstate I-481*

Accident records documented 481 accidents occurring within I-481 limits from RM 481I 3301 1000 to RM 481I 3301 2145. Of the 481 documented accidents in the project area, approximately 91 (19 percent) accidents were personal-injury accidents and 386 (80 percent) accidents were property damage only accidents. There were two non-reportable accidents and two fatalities.

The predominant accident types within the project limits are fixed-object (49 percent), rear-end (20 percent), animal-related (14 percent), and overtaking (13 percent) accidents, which account for 96 percent of the total crashes. There were 40 reported accidents (5 percent) involving commercial vehicles and the remaining accidents involved passenger vehicles only (95 percent).

Major contributing factors to the accidents on I-481 are poor driver judgment/behavior and aggressive driving. Unsafe speed (157 accidents), following too closely (88 accidents), unsafe lane changing (41 accidents), and driver inattention (50 accidents) were identified in a large number of the accidents as the primary contributing factors. In addition, slippery pavement (112 accidents) and animal-action (70 accidents) also were important contributing factors for the accidents.

*Safety Analysis Related to Nonstandard and Nonconforming Features*

A survey of the I-81 and I-690 corridors identified more than 200 nonstandard and nonconforming features in the Project Area. While not all features are equally critical to safe operations, this number indicates the extent of potential design-related safety issues in the corridor. To understand the impacts of the nonstandard and nonconforming features to safety, the following areas with the greatest concentration of design limitations were studied:

- I-81/I-690 S-Curve and Slalom Area
- I-81/I-481 "Northern Interchange"
- I-81/I-481 "Southern Interchange"
- I-81 Southbound at Court Street Weaving Area

*I-81 and I-690 S-Curve and Slalom Area*

The I-81 and I-690 S-Curve and Slalom Area is the area approaching/through the I-81/I-690 interchange. It includes I-81 from Interchange 17 near Colvin Street (south of downtown) to Interchange 25 at 7th N. Street (north of downtown) and I-690 from Interchange 9 in the vicinity of Hiawatha Boulevard (near the fairgrounds) to west of Interchange 15 near Peat Street (northeast of Syracuse University). The area includes I-81 RM 81I 3303 2029 to RM 81I 3303 3008 in the northbound and southbound directions and I-690 RM 690I 3301 2009 to RM 690I 3301 2046 in the eastbound and westbound directions.

Over the three-year analysis period, 1,354 accidents were found to have actually occurred in the S-curve and slalom area – 817 on I-81 between RM 2029 and RM 3008 and 537 on I-690 between RM 2009 and RM 2046. Of these, 1,299 accidents (776 along I-81 and 523 along I-690) could be located, and 55 accidents (41 along I-81 and 14 along I-690) had reference markers unknown.

There are many locations in the S-curve and slalom area with existing nonstandard and nonconforming features. However, based on a detailed examination of accident reports in the greater I-81 at I-690 interchange area, the proportion of accidents that are related to the nonstandard/nonconforming features is relatively small. There were 312 accidents (47 percent) along I-81 between RM 2032 and RM 2166 that were identified to be potentially related to nonstandard/nonconforming geometric features, and there were 116 accidents (27 percent) along I-690 between RM 2014 and RM 2042 that were identified to be potentially related.

Accident rates in this area are 1½ to three times the statewide average. An accident rate comparison for key segments in the I-81/I-690 interchange area is presented in **Table 5-15.**

**Table 5-15**
**I-81/I-690 Interchange Area Accident Rate Comparison**

| Reference Marker | Segment Location | Number of Accidents | Computed Accident Rate | Statewide Accident Rate |
|---|---|---|---|---|
| | | | ACC/MVM | ACC/MVM |
| RM 2043 – RM 2046 | Northbound I-81 from Harrison Street on-ramp to westbound I-690 off-ramp | 66 | 3.21 | 1.09 |
| RM 2047 – RM 2049 | Northbound I-81 at Salina Street | 43 | 2.88 | 1.09 |
| RM 2047 – RM 2049 | Southbound I-81 at Salina Street | 24 | 1.67 | 1.09 |
| RM 2043 – RM 2046 | Southbound I-81 from eastbound I-690 on-ramp to Harrison Street off-ramp | 44 | 2.30 | 1.09 |
| RM 2025 – RM 2028 | Eastbound I-690 from Townsend Street to E. Willow Street | 42 | 2.37 | 1.09 |

*I-81 and I-481 "Southern Interchange"*

The I-81/I-481 "Southern Interchange" is the area surrounding and including the I-81 interchange with I-481 south of Downtown Syracuse. It includes I-81 Interchange 16A and I-481 Interchange 1 in the vicinities of E. Seneca Turnpike and Brighton Avenue, respectively. The area comprises RM (RM) 81I 3303 2006 through RM 81I 3303 2018 in the northbound and southbound directions and RM 481I 3301 1000 through RM 481I 3301 2003 in the eastbound and westbound directions.

Over the three-year analysis period, 90 accidents occurred in the vicinity of the interchange; 68 accidents were located on I-81 between RM 2006 and RM 2018, 18 were located on I-481 between RM 1000 and RM 2003, and four accidents had RMs unknown.

The roadway segments within or immediately adjacent to the interchange meet the NYSDOT threshold of 27 accidents (i.e., 9 per year) needed for an urban full-access controlled facility to qualify as a Priority Investigation Location (PIL) in NYSDOT Region 3. The stretch of I-481 in the southern interchange area is below the PIL threshold. The accident rate (all accident types and both travel directions combined) for the two-lane segment of I-81 from RM 2006 to RM 2015, which includes the potential PIL segment, was estimated to be 1.48 accidents per million vehicle miles (ACC/MVM). This is 1.36 times the statewide average of 1.09 ACC/MVM for a similar urban controlled-access facility. The accident rates for the three-lane segment of I-81 from RM 2016 to RM 2018 and for the two-lane segment of I-481 in its entire stretch within the southern interchange area were estimated to be 0.75 and 0.67 ACC/MVM, respectively – both of which are lower than the applicable statewide average of 1.09 ACC/MVM.

It should be noted that fixed-object, wet-road, and nighttime accidents are high throughout the southern interchange area. Preliminary accident analysis for the I-81 segment suggests that speeding, slippery pavement, and inadequate lighting could be primary and/or contributing factors to accidents throughout the area, including along the nonstandard curve.

Although both directions of I-81 were calculated to have higher accident rates than the overall, wet-road, and fixed-object statewide average, only a small portion of I-81 in the northbound direction between RM 2012 and RM 2014 was identified to have a nonstandard feature (nonstandard curve radius). Based on a detailed examination of police reports, most (60 percent) of the 20 accidents that occurred on northbound I-81 between RM 2012 and RM 2014 were found to be potentially related to the nonstandard curve.

*I-81 and I-481 "Northern Interchange"*

The I-81/I-481 "Northern Interchange" area is the cloverleaf interchange of I-81 with NY 481/I-481 in North Syracuse (i.e., north of Downtown Syracuse and north of the I-81 viaduct S-curve/slalom area). It includes I-81 Interchange 29 and NY 481/I-481 Interchange 9 in the vicinities of Church Street and S. Bay and Thompson Roads. I-81 comprises the north and south legs of the north interchange area, extending from RM (RM) 81I 3303 3047 to RM 81I 3303 3066. The roadway is typically three lanes in each direction. NY 481 and I-481 comprise the west and east legs, respectively, of the north interchange area (i.e., the roadway's jurisdiction changes from Federal to State within the interchange). The NY 481 segment extends from RM 481 3301 1006 to RM 481 3301 1000 and then continues as the I-481

segment from RM 481I 3301 2145 to RM 481I 3301 2135. Both NY 481 and I-481 are typically two lanes in each direction. Although ramps at the interchange have their own reference markers, all ramp accidents were coded to the nearest mainline reference marker for the purposes of this preliminary analysis.

Over the three-year analysis period, 293 accidents were found to have occurred in the vicinity of the interchange – 151 on I-81, 84 on NY 481, 45 on I-481, and 13 with reference markers unknown.

The roadway segments within or immediately adjacent to the interchange meet the NYSDOT threshold of 27 accidents (i.e., 9 per year) needed for an urban full-access controlled facility to qualify as a PIL in NYSDOT Region 3. The accident rates along all roadway segments in the interchange area are higher than the statewide averages for similar facilities. The accident rate on the I-81 segment (for all accident types and both travel directions combined) was calculated to be 1.24 ACC/MVM, which is 1.14 times the statewide average of 1.09 ACC/MVM; the rate along NY 481 was calculated to be 2.11 ACC/MVM, which is 1.94 times the statewide average; and the rate along I-481 was calculated to be 1.11, which is 1.02 times the statewide average. It should be noted that accident frequency north and east of the interchange drops substantially.

Only 100 (34 percent) of these accidents occurred in areas with nonstandard features, and only 11 (4 percent) of the accidents were found to be, or could not be eliminated from being, attributable to nonstandard features. Instead, most of the accidents along the area roadways occurred due to a variety of other factors, including speeding, unsafe lane changing, peak-hour congestion, animals in the roadway, debris in the roadway, and inclement weather conditions. Although the types of, severities of, and contributing factors to the 11 accidents that were likely related to nonstandard features varied by location, the primary contributing factors were nonstandard sight distance, superelevation, and curve radius.

*Southbound I-81 at Court Street Weaving Area*

The southbound I-81 at Court Street weaving area is a section of I-81 from the Bear Street on-ramp to the Genant Drive off-ramp. Accident records documented 51 accidents occurring on southbound I-81 at Court Street weave from RM 81I 3303 2056 to RM 81I 3303 2060. Of the 51 documented accidents in this area, approximately 8 (16 percent) accidents were personal injury accidents and 43 (84 percent) accidents were property damage only accidents. There were no fatalities.

The predominant accident types within the project limits are rear-end (65 percent), overtaking (16 percent), and fixed-object accidents (10 percent), which account for 26 percent of the total crashes. All accidents involved passenger vehicles only.

The contributing factors for the accidents were following too closely (31 accidents), driver inattention (12 accidents), unsafe Speed (11 accidents), pavement slippery (7 accidents), and unsafe lane changing (7 accidents).

**Future No Build Safety Considerations**

Based on the results of the detailed accident analysis performed for the project area, the majority of reported accidents on the interstate freeways (I-81, I-481, and I-690) were rear-end,

overtaking and fixed-object accidents. Rear-end and overtaking accidents typically reflect congested traffic flow conditions and generally result from driver behavior problems such as following too closely, unsafe lane changing, and driver inattention. Traffic congestion during peak periods may encourage drivers to follow too closely, accelerate and decelerate frequently, and make excessive lane changing maneuvers to pass slower vehicles. Fixed-objects accidents often relate to slippery pavement, which also is an important contributing factor. The lack of skid resistance is often caused by the aging and deterioration of pavement. In addition, nonstandard features in the project area, such as insufficient horizontal and vertical stopping sight distance, nonstandard lane and shoulder widths, and insufficient weaving distance can contribute to these types of accidents.

For the No Build Alternative, with traffic growth and unchanged capacity, congestion will be worse than the existing condition. Traffic volume is forecasted to increase approximately 12 percent from 2013 to 2050 and nonstandard features would not be improved under the No Build conditions. In addition, pavement conditions would continue to deteriorate until bridge deck replacements/resurfacing occurs. Therefore, it can be expected that the accident condition would worsen with the No Build Alternative.

Safety performance measures are required to identify safety problems that may exist in the project area and to evaluate the effectiveness of the build alternatives in addressing these problems. Traditionally, evaluating the safety of a proposed improvement alternative begins with a review of the facility's accident history and applying accident reduction factors from NYSDOT's Post Implementation Evaluation System (PIES). PIES includes factors for capital improvements typically constructed as part of a major highway project and low cost improvements (highway signs, pavement markings, signal timing, etc.) that are usually implemented through minor maintenance activities. However, the proposed build alternatives for the I-81 Viaduct Project would alter roadway geometrics substantially, such that proposed roadway segments would not align with existing roadway segments and associated empirical data.

To address this issue, the FHWA Surrogate Safety Assessment Model (SSAM) was used to develop surrogate safety measures of effectiveness (MOEs), based on vehicle trajectory information from the VISSIM microscopic traffic simulation model. One of the surrogate safety measures is the traffic "conflict", defined as an occurrence when two or more road users would collide if intervening action is not taken. The FHWA document "Surrogate Safety Assessment Model (SSAM) and Validation (FHWA-HRT-08-051, June 2008" asserts that the traffic conflict is a reliable surrogate safety measure of comparative safety, due to its correlation with actual crashes. Therefore, higher rates of traffic conflicts can indicate lower levels of safety. This methodology is presented in this section to provide a comparison of existing and No Build condition vehicle conflicts, and is used later in this chapter to compare No Build vehicle conflicts with those for the I-81 Viaduct Project alternatives.

Vehicle trajectories produced by the VISSIM simulation model were input to SSAM to generate traffic conflicts and associated surrogate safety measures. Safety MOEs for 2013 Existing Conditions are compared to the No Build for 2050 peak hours in **Table 5-16**. Total vehicle conflicts would increase 16 percent in AM peak hour and 14 percent in the PM peak hour. The increase in lane-change conflicts would be the most substantial, with a 46 percent

increase during the AM peak hour. Since lane-change conflicts relate closely to traffic congestion, this is indicative of the expected deterioration in traffic operations in the future without the Project. In addition, rear end conflicts for the No Build condition would increase by approximately 14 percent in the AM peak hour and 27 percent in the PM peak hour.

**Table 5-16**
**Existing vs. No Build Condition Vehicle Conflicts**

| Scenario | 2013 Existing Condition | | | 2050 No Build Condition | | |
|---|---|---|---|---|---|---|
| MOE/Peak | AM | PM | AM+PM | AM | PM | AM+PM |
| Rear End Conflicts | 46,493 | 42,064 | 88,557 | 52,796 | 53,415 | 106,211 |
| Lane Change Conflicts | 49,553 | 65,693 | 115,247 | 72,476 | 73,619 | 146,096 |
| Crossing Conflicts | 116,158 | 141,518 | 257,676 | 121,154 | 156,736 | 277,890 |
| Total Conflicts | 212,204 | 249,275 | 461,480 | 246,426 | 283,770 | 530,196 |

### Existing Police, Fire, and Ambulance Access

The Project Area is served by several police and fire departments, as well as ambulance services. Police and fire protection services in the City of Syracuse are provided by the Syracuse Police Department and the Syracuse Fire Department, respectively. Fire Station 1 located at 900 S. State Street and Fire Station 2 at 2300 Lodi Street are both located within the project area but are outside of the project limits. Syracuse Police Department headquarters at 511 South State Street is also inside of the project area but outside of the project limits. (See **Figure 5-7**.)

Ambulance services within the project area are supplied by a group of providers including:

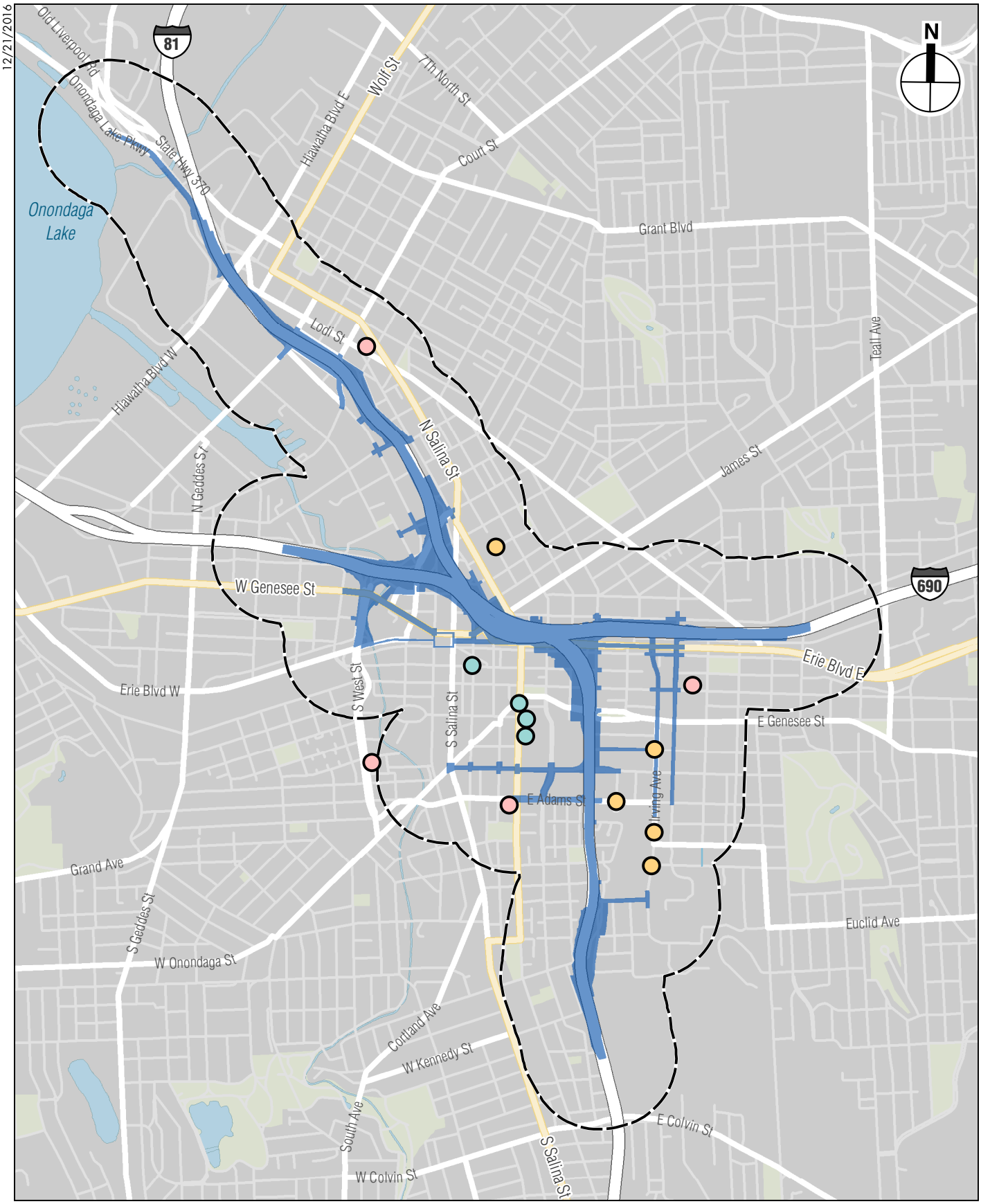
- Rural/Metro Medical Services
- Eastern Ambulance
- Syracuse University Ambulance
- TLC Medical Transportation Services
- Able Medical Transport

Emergency room services are provided at the following major hospitals:

- St. Joseph's Hospital
- Upstate Medical University Hospital
- Crouse Hospital

I-81, I-690, Townsend Street, Irving Avenue, and Adams Street are major access routes for emergency room services.

Emergency services are geographically dispersed throughout the City of Syracuse both within and around the project area and various emergency responders frequently travel on routes through and within the project area.




**I-81 Viaduct Project**

Emergency Services

**Figure 5-7**

## Parking Regulations and Parking Related Conditions

A parking study was initiated for the I-81 Viaduct Project to identify the extent to which on- and off-street parking is available and utilized, and to evaluate potential impacts to parking under each project alternative. The parking within the I-81 Viaduct Study Area is shown in **Figure 5-8**. This section provides a summary of the parking analysis and the complete study is documented in **Appendix C-5.**

*Existing Parking Conditions*

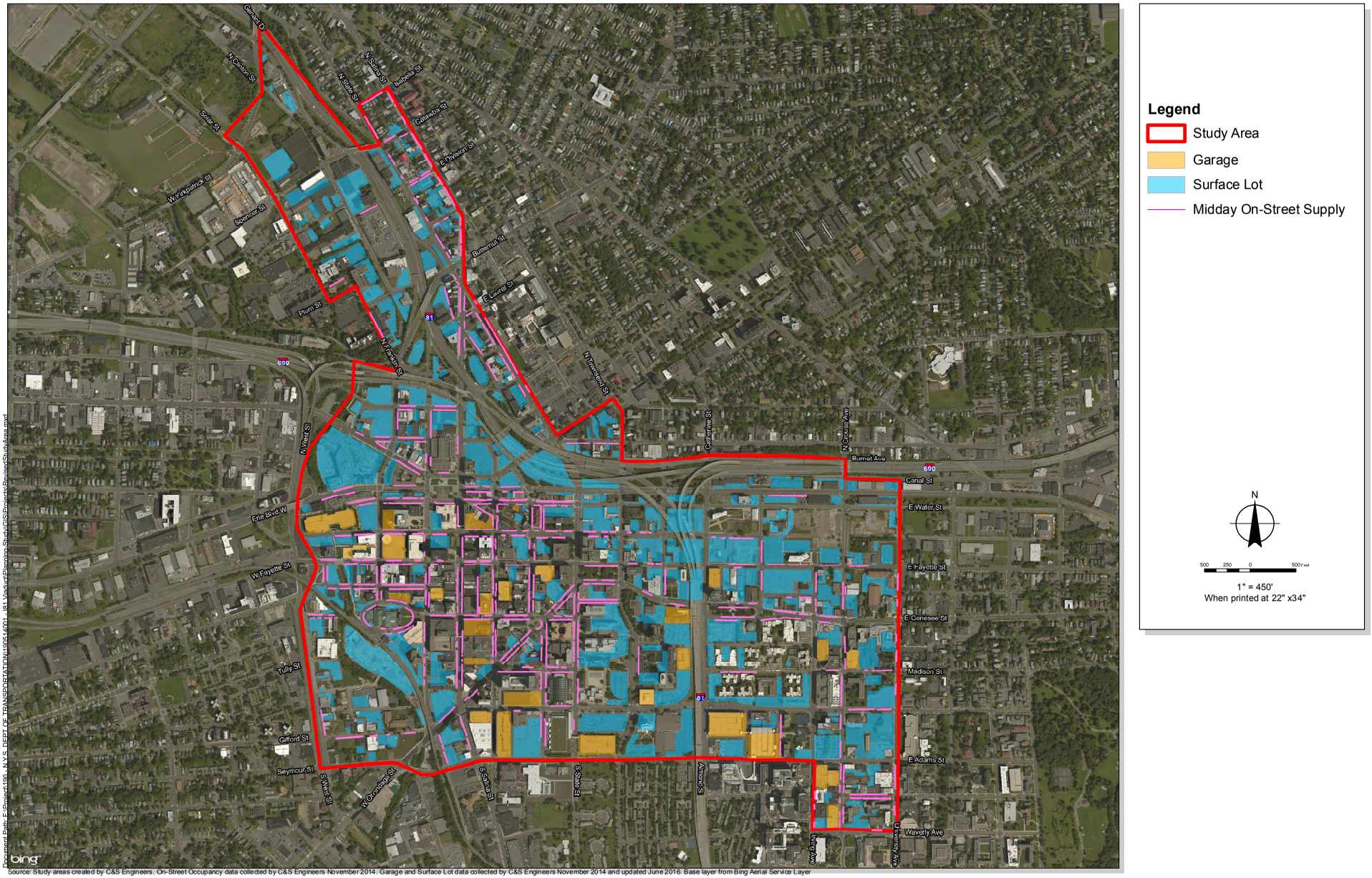
Parking on interstate highways is restricted by law, therefore there is no parking allowed on the interstates or their ramps within the project limits. In addition, parking is not allowed on Almond Street or on most of Adams and Harrison Streets. Throughout the rest of the Project Area, most on-street parking is limited to two-hour, metered parking, and a variety of restrictions, reserved spaces, and loading zones regulate when and where on-street parking is available. Typically, on-street parking restrictions and fees are limited to weekdays. The off-street parking inventory consists of both public and private facilities. Most are surface parking lots, but nearly half of the off-street spaces in the area are within parking garages. The existing total parking supply in the I-81 Viaduct Study Area is 29,233.

Depending on how familiar occupants are with a parking facility, a facility will be perceived as full at less than its capacity. There is also the potential for weather events to affect available parking on-street or within a facility. This reduction of overall supply is known as the effective supply. For consistency with the *2008 Downtown Syracuse Parking Study*, an 85 percent effective supply was assumed for on-street facilities (accounting for higher visitor occupancy and higher chance of being affected by weather)) and 93 percent for off-street facilities (accounting for a higher share of monthly/frequent parkers and lower chance of weather impacts). Peak parking demand within the I-81 Viaduct Study Area occurs midday when parking is approximately 79 percent utilized. While some roadway segments and off-street facilities are over-utilized, some are substantially under-utilized depending on the location of the facility compared to the parking generators (see **Appendix C-5** for Parking Impact Analysis).

*No Build Parking Conditions*

Information was gathered to estimate parking supply and demand changes by 2020 due to known development projects through internet research and coordination with a number of local agencies and other stakeholders. It is assumed that any future parking demand generated past 2020 will be accommodated as part of any future development processes through zoning requirements and/or market demand. It is estimated that the known development projects through 2020 would result in a net increase in parking supply of 2,149 spaces within the I-81 Viaduct Study Area. Therefore, the 2020 future No Build supply is expected to be 31,382 spaces.

The future demand under the No Build Alternative is based on the estimated parking demand generated by the change in households and employees by 2020 within the I-81 Viaduct Study Area, which account for the future projects discussed above. When assumed parking demand ratios are applied to the anticipated change in demographics, the total increase in parking demand is estimated to be approximately 1,800 by 2020. In 2020, parking supply effectively




Parking Study Area

**Figure 5-8**

**I-81 Viaduct Project**

would be 79 percent utilized and would be similar to existing conditions, as shown in **Table 5-17**.

**Table 5-17**
**2020 Future No Build Parking Supply & Demand Summary**

| | Change in Supply | Supply | Effective Supply | Change in Demand | Demand | Utilization |
|---|---|---|---|---|---|---|
| Existing Conditions | | 29,233 | 26,808 | | 21,064 | 79% |
| 2020 Future No Build | 2,149 | 31,382 | 28,779 | 1,782 | 22,846 | 79% |

The No Build analysis indicates that in 2020, the I-81 Viaduct Study Area supply would be adequate to accommodate the demand. .

## Lighting

Within the I-81 Viaduct Study Area, highway lighting is provided along both I-81 and I-690. In addition, there is a variety of street lighting systems throughout the city street grid, including under-bridge lighting beneath both I-81 and I-690. Highway lighting currently is not provided within the I-481 South Study Area, within the I-481 East Study Area, within the I-481 North Study Area or along sections of I-481 between the study areas. The following describes the type and extent of existing lighting within the Project Area.

**Lighting Criteria and Existing Lighting Levels -** The lighting level criteria for existing I-81 and I-690 fall under the "Freeway" classification, as shown in **Table 5-18.** These freeways are within the metropolitan area in or near the City of Syracuse central core, and therefore, the appropriate lighting level would be 0.6 foot-candles (fc). The lighting level criteria for the majority of the other vehicular roadways within the Project Area fall under the "Local" classification, whereas the appropriate lighting level would generally be 0.3 – 0.6 fc depending on the area classification. The lower lighting level of 0.3 fc would be appropriate for local roadways near a residential neighborhood and the higher lighting level of 0.6 fc would be appropriate in more commercial areas that include shopping and retail areas.

**Table 5-18**
**Lighting Criteria**

| Vehicular Roadways | Classification of Area | | |
|---|---|---|---|
| **Seeing Task** | **Commercial** | **Intermediate** | **Residential** |
| Freeway | 0.6 fc | 0.6 fc | 0.6 fc |
| Local | 0.9 fc | 0.6 fc | 0.3 fc |

**Definition:**
Freeway - A divided major highway with full control of access and no crossing at grade
Local - Roadways used primarily for direct access to residential, commercial, or industrial sites.
fc = foot-candle sites

**Reference**: Table 14.3 of the IES Lighting Handbook as per the illuminating Engineering Society of North America.

Existing lighting levels were measured using an Extech Instrument HD450 Datalogging Heavy Duty Light Meter and a selfie stick to hold the reader above the impact of shadows from vehicles and people. Readings were taken approximately 6 feet from the ground. Data was collected with multiple observations of each corridor. Data was collected first by observing the readings of the meter and noting maximums and minimums for each street.

All corridors exhibited instances of zero foot candles where lights were either missing or not currently lit. Data was collected by randomly storing readings while traveling the streets. Data was collected for the major corridors using the automatic reading setting of the meter.

Lighting levels were analyzed on both I-81 and on I-690 throughout the project limits. The presence of lighting on I-81 begins just prior to Hiawatha Boulevard interchange with high tower lights. Standard highway lighting starts at this interchange and runs south to just before the I-481 interchange. Lighting is present on I-690 from I-690 interchange 9 to and to just beyond I-690 interchange 15 (two exits prior to the I-481 interchange with I-690). **Table 5.19** summarizes existing average lighting level measurements

**Table 5-19**
**Existing Light Level Measurements**

| **Measured Foot-Candle (FC) Readings** | | | |
|---|---|---|---|
| **Roadway** | **Highest FC** | **Lowest FC** | **Avg. FC** |
| I-81 Northbound | 2.23 | 0 | 0.37 |
| I-81 Southbound | 2.23 | 0 | 0.36 |

*Existing Light Fixture Types*

- **Northbound and southbound I-81 – Freeway -** Light fixtures are traditional cobra-head roadway lighting. Light fixtures are mounted to a davit arm that is connected a pole +/- 20 feet above finished grade. The fixtures have a high-pressure sodium lamp. The poles are installed on both sides of the freeway at staggered locations. The northbound and southbound interchange consists of three lanes of traffic in each direction separated by a concrete center median.
- **Northbound and southbound I-81 - Beneath the Viaducts -** Light fixtures beneath the viaduct are cobra head light fixtures mounted to bridge steel. The fixture layout does not consider the tunnel effect that the viaduct creates when entering the area beneath the viaduct during the day when the sun is shining. The fixtures appear to be randomly located for general lighting; the locations have not been adjusted to lessen the driver's perception of the tunnel effect. In addition, the lights beneath the viaduct appear to be on continually during the year.

- Local Roadways - Lighting conditions on Catherine Street, Almond Street, North Crouse Avenue, South Crouse Avenue, Irving Avenue, West Genesee Street, James Street, Erie Boulevard, Harrison Street, Adams Street, West Street, Martin Luther King East, Renwick Avenue and Butternut Street were reviewed. The following summarizes the existing lighting:

  **Catherine Street**: (Burnet Avenue to Erie Boulevard)

  - Cobra-head fixtures on davit arm mounted on the traffic signal poles at Catherine Street and Burnet Avenue.
  - Abutment standard wall pack lights beneath I-690.
  - Cobra head fixtures on utility poles from I-690 to Erie Boulevard.

  **Almond Street**: (Erie Boulevard to Van Buren Street)

  - Cobra-head fixtures on utility poles from Erie Boulevard to E. Fayette Street.
  - Acorn Globe on decorative poles with two fixtures per pole (E. Fayette Street to E. Genesee Street where Almond Street passes beneath I-81).
  - Cobra-head fixtures, bridge mounted from E. Genesee Street to Van Buren Street.
  - Northbound Almond between E. Adams Street and E. Genesee Street - Cobra heads on standard davit arm poles.

  **North Crouse Street**

  - Cobra-heads on davit arm mounted on the traffic signal poles at North Crouse Street and Burnet Avenue.
  - Abutment standard wall pack lights beneath I-690.
  - Cobra-head fixtures on utility poles from Burnet Avenue to Erie Boulevard.

  **South Crouse Street**

  - Cobra-head fixtures on davit arms from Erie Boulevard to E. Fayette Street.
  - Cobra-head fixtures on utility poles from E. Fayette Street to Adams Street.
  - Acorn lights South of Adams Street.

  **Irving Avenue**

  - Cobra-head fixtures on utility poles from E. Fayette Street to Madison Street.
  - Cobra-head fixtures on davit arms from Madison Street to Harrison Street.
  - Cobra-head fixtures on utility poles from Harrison Street to Adams Street.
  - Cobra-head fixtures on davit arms at corner of Adams Street.

  **West Genesee Street**

  - Tear drop on a decorative arm on utility poles (limits to West Street).

- Cobra head fixtures on davit arm mounted on the signal at W. Genesee Street and West Street.
- Cobra-head fixtures mounted on West Street bridges.
- Cobra-head fixtures on davit arms from West Street to Wallace Street.
- Acorn lights on decorative green poles (Wallace Street to Clinton Street).

**James Street**

- Acorn lights on decorative green poles (N. Clinton Street to N. Salina Street).
- Cobra-head fixtures on davit arms from N. Salina Street to Burnet Avenue.

**Erie Boulevard**

- Acorn lights on decorative green poles (N. Salina Street to S. Warren Street).
- Cobra-head fixtures on davit arms from S Warren Street to Almond Street.
- Wall packs on piers of I-81.
- Cobra-head fixtures on utility poles from Almond Street to S. Crouse Avenue.

**Harrison Street**

- Acorn globe on decorative poles (S. Salina to S. Warren Street).
- Tear drop fixtures on decorative poles (S. Warren Street to Almond Street).
- Cobra-head fixtures on utility poles from Almond Street to S. Crouse Avenue.

**Adams Street**

- Cobra-head fixtures on davit arms (S. State Street to Almond Street).

**North West Street**

- Cobra-head fixtures on standard arms and pole (I-690 to Erie Boulevard).

**Martin Luther King Jr., East/E Castle Street**

- Cobra-head fixtures on utility poles from Salina Street to Renwick Avenue.

**Renwick Avenue**

- Cobra-head fixtures on utility poles from Martin Luther King Jr., East to I-81 bridges.
- Bridge-mounted cobra-heads under I-81 bridges (not working during site visit).
- Cobra-head fixtures on davit arms (I-81 bridges to New York, Susquehanna and Western Railway Bridge).
- Walk pack lights on retaining wall beneath the railroad and Fineview Place bridges.

- Cobra-head fixtures on utility poles from Fineview Place Bridge to Van Buren Street.

### Ownership and Maintenance Jurisdiction

**Table 5.20** shows the ownership and maintenance of the roads, highways, bridges, and lighting within the Project Area.

**Table 5-20**
**Ownership and Maintenance Jurisdiction**

| Highway | Limits | Feature(s) being Maintained | Maintaining Agency | Owned By (1) |
|---|---|---|---|---|
| I-81 (NB & SB) | Seneca Turnpike to S. Bay Road | Highway, Bridges & Ramps | NYSDOT | NYSDOT |
| Project-wide | Project-wide | Lighting | City of Syracuse | NYSDOT |
| I-690 (EB & WB) | Leavenworth Ave. to Beech St. | Highway, Bridges & Ramps | NYSDOT | NYSDOT |
| I-481 (NB & SB) | Southern I-81 Interchange to Northern I-81 Interchange | Highway, Bridges & Ramps | NYSDOT | NYSDOT |
| West Street | Shonnard St. to I-690 | Highway, Bridges, Ramps | City of Syracuse | NYSDOT |
| West Street Western Frontage Road | All | Highway | City of Syracuse | City of Syracuse |
| West Street to Herald Place Ramp | All | Bridges & Ramps | NYSDOT | NYSDOT |
| Shonnard St. | West St. to Adams St. | Highway | City of Syracuse | NYSDOT |
| Seymour St. | West St. to Adams St. | Highway | City of Syracuse | NYSDOT |
| Almond St. | Van Buren St. to Adams St. | Highway | City of Syracuse | City of Syracuse |
| Almond St. | Adams St. to Harrison St. | Highway | City of Syracuse | NYSDOT |
| Almond St. | Harrison St. to Erie Blvd. | Highway | City of Syracuse | City of Syracuse |
| West Genesee St. | Plum St. to N. Salina St. | Highway | City of Syracuse | City of Syracuse |
| MLK. Jr., East | Leon St. to Renwick Ave | Highway | City of Syracuse | City of Syracuse |
| Renwick Ave. | All | Highway | City of Syracuse | City of Syracuse |
| Fineview Place | All | Highway, Bridge | City of Syracuse | City of Syracuse |
| Van Buren St. | All | Highway | City of Syracuse | City of Syracuse |
| Burt St. | West of Almond St. | Highway | City of Syracuse | City of Syracuse |

**Table 5-20**
**Ownership and Maintenance Jurisdiction**

| Highway | Limits | Feature(s) being Maintained | Maintaining Agency | Owned By (1) |
|---|---|---|---|---|
| Burt St. | East of Almond St. | Highway | Private | Private |
| E Taylor St. | All | Highway | City of Syracuse | City of Syracuse |
| Jackson St. | All | Highway | City of Syracuse | City of Syracuse |
| Monroe Ave. & Extension | All | Highway | City of Syracuse | City of Syracuse |
| Adams St. | West of Almond St. | Highway | City of Syracuse | NYSDOT |
| Adams St. | East of Almond St. | Highway | City of Syracuse | City of Syracuse |
| Harrison St. | All | Highway | City of Syracuse | City of Syracuse |
| Madison St. | All | Highway | City of Syracuse | City of Syracuse |
| Cedar St. | All | Highway | City of Syracuse | City of Syracuse |
| E. Genesee St. | All | Highway | City of Syracuse | City of Syracuse |
| Jefferson St. | All | Highway | City of Syracuse | City of Syracuse |
| E. Fayette St. | All | Highway | City of Syracuse | City of Syracuse |
| E. Washington St. | All | Highway | City of Syracuse | City of Syracuse |
| Water St. | All | Highway | City of Syracuse | City of Syracuse |
| Catherine St. | All | Highway | City of Syracuse | City of Syracuse |
| Canal St. | All | Highway | City of Syracuse | City of Syracuse |
| Irving Ave | All | Highway | City of Syracuse | City of Syracuse |
| Crouse Ave | All | Highway | City of Syracuse | City of Syracuse |
| Burnet Ave | All | Highway | City of Syracuse | City of Syracuse |
| Erie Blvd | All | Highway | City of Syracuse | City of Syracuse |
| South McBride St. | All | Highway | City of Syracuse | City of Syracuse |
| South Townsend St | All | Highway | City of Syracuse | City of Syracuse |
| North & South State St. | All | Highway | City of Syracuse | City of Syracuse |
| Oswego Blvd. | All | Highway | City of Syracuse | City of Syracuse |
| Pearl St | All | Highway | City of Syracuse | City of Syracuse |
| James St. | All | Highway | City of Syracuse | City of Syracuse |
| Willow St. | All | Highway | City of Syracuse | City of Syracuse |
| Warren St. | All | Highway | City of Syracuse | City of Syracuse |
| Hickory St. | All | Highway | City of Syracuse | City of Syracuse |
| North Salina St. | All | Highway | City of Syracuse | City of Syracuse |
| Marnell Ave. | All | Highway | City of Syracuse | City of Syracuse |
| N. Clinton St. | All | Highway | City of Syracuse | City of Syracuse |
| N. Franklin St. | All | Highway | City of Syracuse | City of Syracuse |
| Evans St. | All | Highway | City of Syracuse | City of Syracuse |
| Herald Place | All | Highway | City of Syracuse | City of Syracuse |
| Wallace St. | All | Highway | City of Syracuse | City of Syracuse |
| Belden Ave | All | Highway | City of Syracuse | City of Syracuse |

**Table 5-20**
**Ownership and Maintenance Jurisdiction**

| Highway | Limits | Feature(s) being Maintained | Maintaining Agency | Owned By (1) |
|---|---|---|---|---|
| Butternut St | All | Highway | City of Syracuse | City of Syracuse |
| Butternut St | Bridge over I-81 | Bridge | NYSDOT | NYSDOT |
| Genant Dr. | All | Highway | City of Syracuse | City of Syracuse |
| West Division St. | All | Highway | City of Syracuse | City of Syracuse |
| Spencer St. | All | Highway | City of Syracuse | City of Syracuse |
| Spencer St. | Bridge over I-81 | Bridge | NYSDOT | NYSDOT |
| Court St. | All | Highway | City of Syracuse | City of Syracuse |
| Court St. | Bridge over I-81 | Bridge | NYSDOT | NYSDOT |
| Kirkpatrick St. | All | Highway | City of Syracuse | City of Syracuse |
| Sunset Ave. | All | Highway | City of Syracuse | City of Syracuse |
| Bear St. | South of I-81 | Highway | City of Syracuse | NYSDOT |
| Bear St. | Over I-81 | Bridge | NYSDOT | NYSDOT |
| Bear St. | North of I-81 | Highway | City of Syracuse | City of Syracuse |
| Ramp from Old Liverpool Road to I-81SB | All | Highway, Bridge | NYSDOT | NYSDOT |
| Ramp from Onondaga Lake Parkway to I-81SB | All | Highway, Bridge | NYSDOT | NYSDOT |
| NYS&W Railroad Bridge | | Bridge | NYS&W | NYS&W |
| East Glen Ave. | All | Highway | City of Syracuse | City of Syracuse |
| East Glen Ave | Bridge over I-81 | Bridge | NYSDOT | NYSDOT |
| South Bay Road | Bridge over I-81 | Bridge | NYSDOT | NYSDOT |
| South Bay Road | All | Highway | Onondaga County | Onondaga County |
| Rock Cut Road | All | Highway | City of Syracuse | City of Syracuse |
| East Brighton Ave | Bridges over I-81 | Bridge | NYSDOT | NYSDOT |
| East Brighton Ave | All | Highway | City of Syracuse | City of Syracuse |

## MULTIMODAL

### Existing Pedestrian Conditions

Pedestrians are prohibited on I-690, I-81, and I-481 by state law.

Sidewalks, including beneath the I-81 viaduct on Almond Street, are not continuous in the I-81 Viaduct Study Area. There is no sidewalk on the west side of Almond Street between Genesee Street and Adams Street, nor is there one on Renwick Avenue between Van Buren Street and Martin Luther King Jr., East. There is no sidewalk on the east side of West Street between Genesee Street and the on-ramp to West Street at Erie Boulevard, or on the north side of Water Street from Almond Street to its eastern termination at South Beech Street. North of

the I-690 corridor, there is no sidewalk on the south side of Burnet Avenue from Catherine to Crouse Avenue, on Evans Street, on the north side of Butternut Street from the existing I-81 on-ramp near State Street to the existing I-81 off ramp near Franklin Street, on the east side of Genant Drive, on the north side of Spencer Street from Genant Drive to Clinton Street, on the south side of Spencer from Clinton to Solar Street, on either side of Court Street from Genant Drive to Clinton Street, on either side of Bear Street to the east and west beyond the bridge over I-81, or on Hiawatha Boulevard from I-81 to the east.

Some sidewalks within the I-81 Viaduct Study Area are paved over by adjacent driveways and parking lots creating an unsafe condition and gaps in pedestrian connectivity. This condition exists on the north side of Genesee Street between Plum Street and West Street, intermittently on the south side of Erie Boulevard from west of State Street to east of Townsend Street, on both sides of Water Street from State Street to west of McBride Street, on the north side of Burnet Avenue from Catherine Street to east of Crouse Avenue, and between Canal Street and Erie Boulevard on Crouse Avenue, University Avenue, and Lodi Street.

The sidewalk on the east side of Renwick Avenue, beneath the New York Susquehanna and Western Railway is in a deteriorated condition hindering ADA-compliant pedestrian access.

Most intersections within the I-81 Viaduct Study Area have curb ramps, but many do not meet current Americans with Disabilities Act Accessibility guidelines (ADAAG)/Public Rights-of-Way Accessibility Guidelines (PROWAG), and NYSDOT *Highway Design Manual* Chapter 18 standards. Pedestrian signals with push buttons and marked crosswalks are in place in some locations, but are not consistent across the Project Area. In many cases, marked crosswalks are worn or no longer visible. On Almond Street, at both the Harrison and Adams Street intersections, crosswalks are missing from the north side of the intersection for east-west pedestrian traffic due to conflicts with vehicular turning movements. At the Willow Street intersections with Warren and Pearl streets, no crosswalks are provided for north-south pedestrian traffic. At the intersection of James Street and Oswego Boulevard, no crosswalk is provided at the west side of the intersection. The Onondaga Creekwalk is a shared-use (bicycle and pedestrian) path that, with the exception of the block between Spencer Street and West Kirkpatrick Street, follows the alignment of Onondaga Creek from the Inner Harbor to Wallace Street. Between Wallace Street and Fayette Street, the Creekwalk is diverted away from the creek onto the adjacent city sidewalk system for several blocks.

As part of its *University Hill Transportation Study* (2006/2007), SMTC provided an overview of existing pedestrian and bicycle conditions and made recommendations for potential improvements. The *University Hill Transportation Study* focused on conditions within University Hill and considered connectivity between University Hill and Downtown. The study identified I-81 as a barrier to pedestrian and bicyclist mobility, noting the width of Almond Street, as well as inadequate pedestrian infrastructure and multiple vehicular turning movements on the street, as concerns.

In 2010, SMTC released the *Almond Street Corridor Pedestrian Study* to address potential increasing pedestrian activity associated with anticipated growth in the University Hill area. This growth was expected to result in increased pedestrian activity crossing Almond Street between E. Genesee Street and Adams Street (under I-81), which is within the I-81 Viaduct

Study Area. Two of the locations lacking crosswalks noted above – the north side of Harrison Street at Almond Street, and the north side of Adams Street at Almond Street are within this area of increased pedestrian activity related to the expansion of hospital related housing on the west side of the viaduct. The *Almond Street Corridor Pedestrian Study* identified various constraints in this corridor, such as incomplete or inadequate pedestrian infrastructure, uninviting pedestrian environment, and dangerous pedestrian and vehicle conflicts. In addition, the study noted that there are no designated bike lanes along Almond Street, requiring bicyclists to use general travel lanes.

### No Build Pedestrian Conditions

The No Build Alternative would retain the highway in its existing condition, implementing ongoing maintenance and repairs as needed to keep it safe for the traveling public. Therefore the No Build Alternative would not result in improved pedestrian accommodation, connectivity, and safety, and the deficiencies and lack of connectivity that characterize the existing condition would remain

### Existing Bicycle Conditions

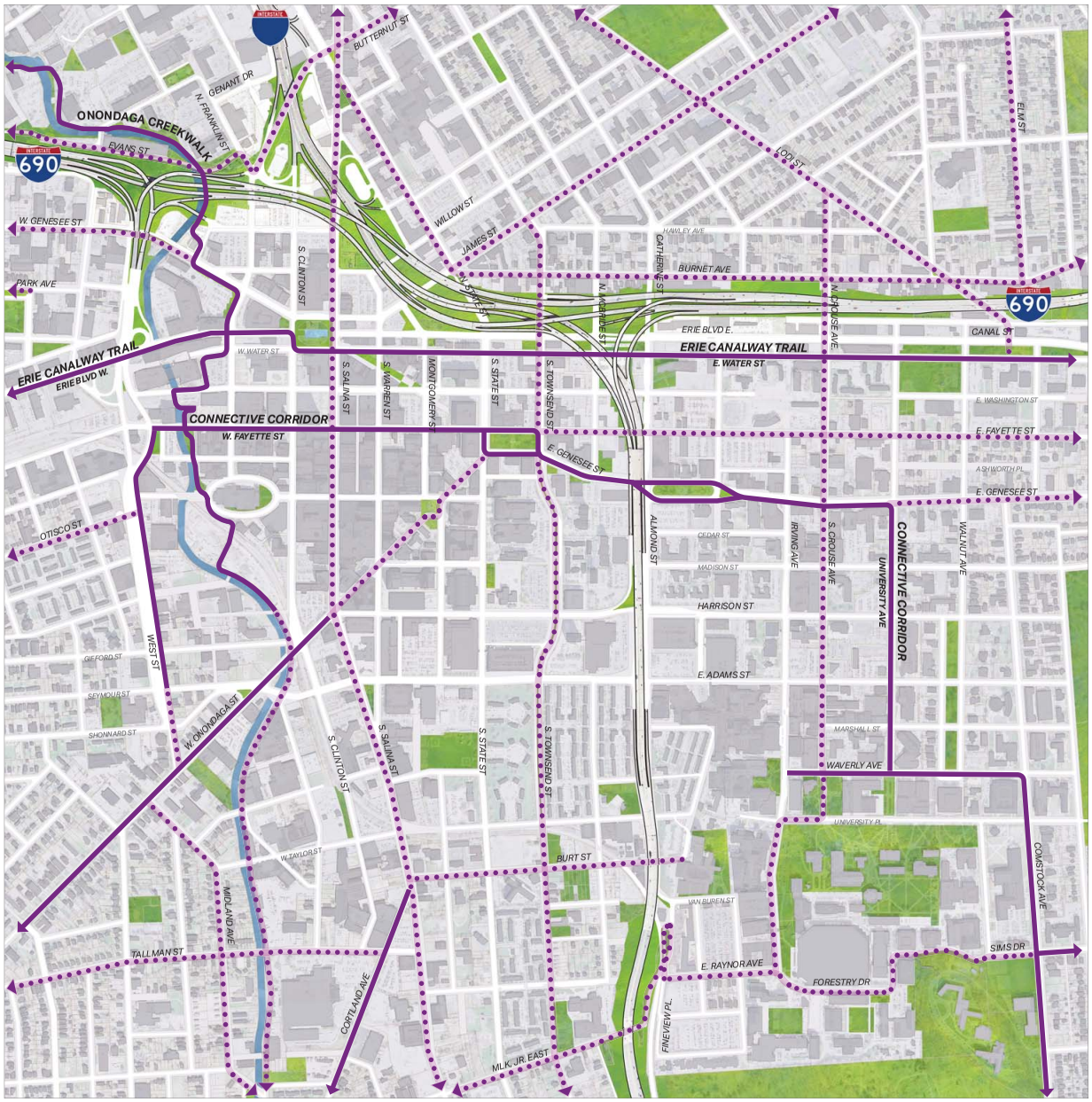
Bicyclists are prohibited on I-690, I-81, and I-481 by state law.

Existing bicycle facilities within the Project Area include the Connective Corridor, the Erie Canalway Trail, the Onondaga Creekwalk shared-use (bicycle and pedestrian) path, and several city streets with bike lanes. These facilities are dispersed and do not form an interconnected network.

Several initiatives have been underway in the City of Syracuse to enhance bicycle and pedestrian connectivity. As shown in **Figure 5-9**, designated bicycle infrastructure has been established (or is planned) throughout the City. As discussed above, some of these routes are part of local bicycle and pedestrian initiatives, such as the City/SMTC Bikeway and Creekwalk, while others are part of larger regional routes, such as New York State Bicycle Route 11 and the Erie Canalway Trail. In addition, Syracuse University has worked to enhance bicycle and pedestrian infrastructure by developing the Connective Corridor, which is a two-mile separated bicycle facility that crosses east-west under the viaduct and connects the University Hill area with Downtown business and residential districts. However, the existing bicycle infrastructure does not provide an interconnected system of bike routes for commuting, and the bicycle infrastructure along the I-81 viaduct (near Downtown, Southside, and University Hill) is lacking, thereby limiting bicycle connectivity between areas east and west of I-81.

### No Build Bicycle Conditions

The No Build Alternative would retain the highway in its existing condition, implementing ongoing maintenance and repairs as needed to keep it safe for the traveling public. Therefore the No Build Alternative would not result in improved bicycle accommodation, connectivity, and safety, and the deficiencies and lack of connectivity that characterize the existing condition would remain.




EXISTING AND MUNICIPAL PROPOSED BICYCLE NETWORK

## LEGEND

Existing City Bicycle Facility

Proposed City Bicycle Facility*

* *Syracuse Bicycle Plan: A Component of the Syracuse Comprehensive Plan*, 2012

150' 0' 300' 900'

# Designated and Planned Bicycle Facilities

## Transit

*Existing Transit Conditions*

Public transportation services in the Project Area are provided by the Central New York Regional Transit Authority (Centro). Centro currently operates fixed bus routes mainly in the city of Syracuse and suburban Onondaga County. The routes operate on a hub-and-spoke route system with the majority of the routes traveling to the Centro Transit Hub located in the heart of Downtown Syracuse (at the corner of Adams Street and South Salina Street). In addition to the fixed bus routes, Centro also operates Syracuse University shuttle routes, paratransit, and special services for local schools and special events. The core ridership within the bus system is made up of transit-dependent markets such as densely populated and low income neighborhoods, and Syracuse University and other similar institutions.

The Syracuse Transit System Analysis (STSA), completed by the NYSDOT in 2014 as part of The I-81 Challenge, identifies a continuum of transit services, from basic bus service to bus rapid transit (BRT) and light rail transit (LRT). Based on the STSA results, several corridors and strategies are recommended for further study and implementation. These recommendations include:

- Pursue higher-intensity transit services within the two corridors including (1) the Destiny USA/Regional Transportation Center (RTC) to Syracuse University and (2) James Street/South Avenue: Onondaga Community College (OCC) to East Syracuse.
- Begin a commuter-based express bus service along I-81 from Central Square to Downtown/University Hill.
- Construct a new transit hub on University Hill.
- Optimize basic bus service on a number of high-use corridors, such as Destiny USA/RTC to Syracuse University.

*Future No Build Transit Conditions*

Currently, the Syracuse Metropolitan Transportation Council (SMTC) is conducting the "Syracuse Metropolitan Area Regional Transit Study Phase 1 (SMART 1)" study. It began in June 2015 to pursue higher-intensity transit services within the two corridors (Destiny USA/RTC to Syracuse University and OCC to East Syracuse) recommended by the STSA. Strategies for transit service enhancement include the improvement of existing bus services, introduction of bus rapid transit (BRT), and implementation of light rail transit (LRT) or streetcars.

It is expected that both STSA and SMART 1 would help Centro establish the basis to pursue Federal Transit Administration (FTA) New Starts, Small Starts, or Very Small Starts funding. Since the determination of specific transit enhancements and their relation to the I-81 Project Area is unknown at this time, it is important for the I-81 build alternatives to have flexible roadway configurations which would not preclude any future transit system improvements such as setting aside potential right of way for future dedicated bus lanes or other recommendations that may physically alter the streets.

### Airports, Railroad Stations, and Ports

Syracuse Hancock International Airport is located approximately 5.3 miles north of the I-81/I-690 interchange and no conflicts exist with the flight paths of aircraft using this airport.

The Syracuse Amtrak railroad station is located in the northeastern corner of the I-81 Viaduct Study Area at the William F. Walsh Regional Transportation Center, which is also adjacent to the Destiny USA shopping mall. The station is located approximately two miles north of the I-81/I-690 interchange and no conflicts exist with the Amtrak station or access to the station.

The Inner Harbor is a former port facility located approximately 0.3 miles north of I-690 and 0.3 miles west of I-81, on the south end of Onondaga Lake, near the outlet of Onondaga Creek. The Inner Harbor is part of the Barge Canal system and is no longer used for commercial purposes, but it is used for recreational purposes.

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

There are numerous parks and recreational areas within the project limits that are accessed from the existing city street system. There are no parks or recreational areas that are accessed directly from the interstate system within the Project Area. Wilson Park and Forman Park are both City of Syracuse parks accessed from Almond Street in the Project Area. Parks accessed from other city streets near the Project Area including Clinton Square, Firefighters' Park, Libba Cotten Grove, Roesler Park, Leavenworth Park, Ormand Spencer Park, Franklin Square Park, Union Park, and Washington Square Park. In addition, various bike facilities and shared-use (bicycle and pedestrian) paths within the Project Area are accessed from the city street system, including the statewide Erie Canalway Trail, the Connective Corridor bicycle facility and the Creekwalk shared-use (bicycle and pedestrian) facility. Onondaga Lake and the Inner Harbor, both of which are part of the Erie Canal, are accessed from the city street system. There are no state lands within the I-81 Viaduct Project Area, but there are two wildlife management areas (Hamlin Marsh Wildlife Management Area and the Cicero Swamp Wildlife Management Area) that are located adjacent to the I-481 North Study Area.

## INFRASTRUCTURE

### Existing Highway Section

I-81 is a limited-access highway, with two or three lanes in each direction through Syracuse. Traveling north from the southerly I-81/I-481 interchange (I-81 Interchange 16A), I-81 is on embankment and generally consists of 12-foot lanes, 4-foot median side shoulders, and 8-foot outside shoulders. I-81 consists of four travel lanes (two lanes in each direction) south of the I-481 interchange and six lanes (three lanes in each direction) between the I-481 interchange and the Adams Street interchange. The 2.5-mile segment of I-81 between I-481 and the New York Susquehanna, and Western (NYS&W) Railway passes Morningside and Oakwood Cemeteries as it travels through the south part of the city.

Once I-81 crosses the NYS&W Railway, it transitions from an embankment to a viaduct (an elevated bridge with multiple spans). The 1.5-mile viaduct section generally consists of 12-foot lanes, 2.5-foot median side shoulders, and 2.5-foot outside shoulders. South of Adams Street, the section consists of six travel lanes (three lanes in each direction); north of Adams Street,

the section consists of four travel lanes (two lanes in each direction). Local streets pass beneath and along the viaduct through neighborhoods including Southside, University Hill, and Downtown. North of Fayette Street, I-81 turns westward and continues on a viaduct with a series of ramps connecting I-81 with I-690. These ramps provide direct access from northbound I-81 to eastbound I-690 and from westbound I-690 to southbound I-81, but there are no direct connections between southbound I-81 and westbound I-690 or from eastbound I-690 to northbound I-81. The two highways use separate viaducts as they travel east-west along the north side of Downtown Syracuse until turning to the northwest in the vicinity of Salina Street.

North of I-690, I-81 initially transitions from a viaduct to a depressed highway and then ascends to ground level near Spencer Street, where it traverses a former warehouse and industrial area and then passes Destiny USA, a 2.4-million-square-foot shopping mall at the intersection of Onondaga Lake Parkway and Hiawatha Boulevard. Within this 1.5-mile section, I-81 generally consists of three 12-foot travel lanes in both directions with 4-foot median side shoulders, and 6- to 10-foot outside shoulders. The transition from two to three lanes begins just north of Salina Street in the northbound direction; the southbound transition from three to two lanes occurs at the Clinton Street exit.

Upon exiting the I-81 Viaduct Project Area north of Hiawatha Boulevard, I-81 passes a collection of low- and mid-rise hotels, as well as a few office parks surrounding the interchange with the New York State Thruway (I-90). I-81 then travels through mostly low-density, suburban commercial areas as it passes west of Syracuse Hancock International Airport. Continuing north to I-481, the highway serves the low-density residential and commercial uses of the northern suburbs. The section of I-81 north of Hiawatha Boulevard continues as a six-lane (three lanes in each direction) section for approximately 17 miles to the north before transitioning back to a 4-lane section just north of Central Square (Exit 32).

I-690 is about 14 miles long, beginning on the west at Interchange 39 on I-90 in Van Buren and traveling in a southeasterly direction through Geddes, Syracuse, and East Syracuse where it terminates at I-481 in DeWitt on the east. As I-690 travels through Downtown Syracuse within the I-81 Viaduct Study Area, there is an interchange at West Street and West Genesee Street (Exit 11/12), the partial interchange with I-81, and a partial interchange at Townsend Street/McBride Street (Exit 13). I-690 generally consists of six 12-foot travel lanes (three lanes in each direction), but includes several segments that are four lanes (two lanes in each direction), including the segment between West Street and State Street within the Project Area. The median side shoulders generally vary from 3.5 to 6 feet, and outside shoulders vary from 4 to 10 feet. Within the I-81 interchange area, I-690 is primarily on viaduct.

I-481 is a 15-mile interstate highway that loops through the eastern suburbs of Syracuse, bypassing the city. I-481 generally consists of four 12-foot travel lanes (two lanes in each direction) with 6-foot median side shoulders and 10-foot outside shoulders. I-481 begins at I-81 (Interchange 16A) in the southern part of Syracuse and travels northeasterly through Onondaga County. I-481 becomes a north-south roadway through DeWitt and East Syracuse, where it intersects with I-690 and I-90. After the interchange with I-90, I-481 takes a northwesterly alignment through Cicero. I-481's interstate designation ends at Interchange 29 in North Syracuse, where it rejoins I-81. After Interchange 29, the highway continues as NY

481 to Oswego. Just north of the interchange with I-690, I-481 traverses the CSX rail yards on an approximately 2,100-foot-long bridge. On the bridge, both the median side shoulder and the outside shoulder narrow to approximately 3 feet.

Where I-81 passes through Downtown Syracuse (as a viaduct), the local street network is characteristic of a typical city street grid, with east-west streets passing beneath the viaduct and Almond Street traveling north-south beneath and adjacent to the viaduct. Local streets also pass along and beneath the I-81 and I-690 interchange. Local streets comprise a mix of one- and two-way streets. Most streets provide some level of pedestrian accommodations, with sidewalks at least on one side of the street, though some sidewalks are discontinuous. Pedestrian crossings across Almond Street (beneath the I-81 viaduct) are limited, and at some locations, crosswalks are not provided at all legs of the intersection. Designated bicycle facilities are also limited in the I-81 Viaduct Study Area, with the exception of Genesee Street, which carries the Connective Corridor.

### Geometric Design Elements Not Meeting Minimum Standards

As discussed above, over 200 non-standard and non-conforming features exist along the sections of I-81, I-690 and I-481 in the Project Area. In particular, the I-81/I-690 interchange is a complex intersection of two elevated highways with multiple entrance and exit ramps. The intricate movements through which drivers must navigate, combined with the abundance of non-standard and non-conforming features, contribute to the high-accident conditions in the corridor. As indicated in **Table 5-21**, there are numerous existing non-standard features within the viaduct and I-81/I-690 interchange areas, including inadequate sight-distances, shoulder widths, lane widths, median widths, grades, curve radii, and super elevations. In some areas, shoulders are non-existent and medians are narrow, affording only enough space for concrete barriers that separate opposing traffic lanes. In addition, a number of ramps provide inadequate acceleration/deceleration length, and in several locations, ramps are too closely spaced and fail to conform to AASHTO's recommended design standards. As discussed above, these conditions contribute to traffic congestion, reduce safety, and impede emergency response, thereby contributing to potential traffic incidents.

**Table 5-21**
**Existing Nonstandard Features [1]**

| Location (reference marker) | Critical Design Element (2) | Design Speed (mph) | Design Standard | Existing Condition |
|---|---|---|---|---|
| Viaduct Area (3) | | | | |
| 81I 3303 2033 | HSSD | 60 | 570 | 350 |
| 81I 3303 2033 | HSSD | 60 | 570 | 514 |
| 81I 3303 2034 | HSSD | 60 | 570 | 352 |
| 81I 3303 2034 | HSSD | 60 | 570 | 523 |
| 81I 3303 2035 | HSSD | 60 | 570 | 425 |
| 81I 3303 2036 | HSSD | 60 | 570 | 402 |
| 81I 3303 2037 | HSSD | 60 | 570 | 552 |
| 81I 3303 2042 | HSSD | 60 | 570 | 332 |
| 81I 3303 2044 | HSSD | 60 | 570 | 352 |
| 81I 3303 2044 | HSSD | 60 | 570 | 554 |

**Table 5-21**
**Existing Nonstandard Features [1]**

| Location (reference marker) | Critical Design Element (2) | Design Speed (mph) | Design Standard | Existing Condition |
|---|---|---|---|---|
| 81I 3303 2035 | VSSD | 60 | 570 | 536 |
| 81I 3303 2036 | VSSD | 60 | 570 | 516 |
| 81I 3303 2033 | Left SHLD Width | 60 | 4 | 2.8 |
| 81I 3303 2033 | Right SHLD Width | 60 | 10 | 2.5 |
| 81I 3303 2033 | Right SHLD Width | 60 | 10 | 3.0 |
| 81I 3303 2033-42 | Left SHLD Width | 60 | 4 | 2.8 |
| 81I 3303 2036 | Right SHLD Width | 60 | 10 | 2.5 |
| 81I 3303 2036 | Right SHLD Width | 60 | 10 | 3.0 |
| 81I 3303 2037 | Left SHLD Width | 60 | 4 | 3.2 |
| 81I 3303 2037 | Right SHLD Width | 60 | 10 | 2.1 |
| 81I 3303 2038 | Right SHLD Width | 60 | 10 | 2.5 |
| 81I 3303 2040 | Right SHLD Width | 60 | 6 | 1.6 |
| 81I 3303 2041 | Right SHLD Width | 60 | 6 | 2.8 |
| 81I 3303 2041 | Right SHLD Width | 60 | 10 | 2.2 |
| 81I 3303 2042 | Right SHLD Width | 60 | 10 | 2.7 |
| 81I 3303 2036 | Superelevation (6% Max) | 60 | 4.8% | 4.1% |
| 81I 3303 2036 | Superelevation (6% Max) | 60 | 4.8% | 3.9% |
| 81I 3303 2038 | Superelevation (6% Max) | 60 | 3.4% | 2.1% |
| 81I 3303 2038 | Superelevation (6% Max) | 60 | 3.4% | 2.5% |
| 81I 3303 2038 | Median Width | 60 | 10 | 8 |
| I-81/I-690 Interchange Area (3) | | | | |
| 81I 3303 2044 | Horizontal Curvature | 60 | 1330 | 1134 |
| 81I 3303 2044 | Horizontal Curvature | 40 (Ramp) | 485 | 459 |
| 81I 3303 2045 | Horizontal Curvature | 60 | 1330 | 1106 |
| 81I 3303 2045 | Horizontal Curvature | 40 (Ramp) | 485 | 411 |
| 81I 3303 2048 | Horizontal Curvature | 60 | 1330 | 1092 |
| 81I 3303 2048 | Horizontal Curvature | 60 | 1330 | 1054 |
| 81I 3303 2049 | Horizontal Curvature | 60 | 1330 | 1156 |
| 81I 3303 2049 | Horizontal Curvature | 60 | 1330 | 1130 |
| 690I 3303 2023 | HSSD | 60 | 570 | 368 |
| 690I 3303 2024 | HSSD | 60 | 570 | 442 |
| 690I 3303 2024 | HSSD | 60 | 570 | 302 |
| 690I 3303 2024 | HSSD | 60 | 570 | 494 |
| 690I 3303 2027 | HSSD | 60 | 570 | 337 |
| 690I 3303 2027 | HSSD | 40 (Ramp) | 305 | 257 |
| 690I 3303 2027 | HSSD | 60 | 570 | 377 |
| 690I 3303 2028 | HSSD | 60 | 570 | 427 |
| 690I 3303 2028 | HSSD | 40 (Ramp) | 305 | 182 |
| 690I 3303 2029 | HSSD | 60 | 570 | 474 |
| 690I 3303 2030 | HSSD | 40 (Ramp) | 305 | 225 |
| 81I 3303 2044 | HSSD | 40 (Ramp) | 305 | 231 |
| 81I 3303 2045 | HSSD | 60 | 570 | 280 |
| 81I 3303 2045 | HSSD | 60 | 570 | 428 |

**Table 5-21**
**Existing Nonstandard Features [1]**

| Location (reference marker) | Critical Design Element (2) | Design Speed (mph) | Design Standard | Existing Condition |
|---|---|---|---|---|
| 81I 3303 2045 | HSSD | 60 | 570 | 541 |
| 81I 3303 2047 | HSSD | 60 | 570 | 264 |
| 81I 3303 2047 | HSSD | 60 | 570 | 424 |
| 81I 3303 2048 | HSSD | 60 | 570 | 259 |
| 81I 3303 2048 | HSSD | 60 | 570 | 422 |
| 81I 3303 2049 | HSSD | 60 | 570 | 474 |
| 81I 3303 2049 | HSSD | 30 (Ramp) | 200 | 93 |
| I81 3303 2048 | VSSD | 60 | 570 | 516 |
| I81 3303 2048 | VSSD | 60 | 570 | 538 |
| I81 3303 2049 | VSSD | 60 | 570 | 565 |
| 690I 3303 2029 | VSSD | 60 | 570 | 524 |
| 81I 3303 2042-49 | Left SHLD Width | 60 | 4 | 3.2 |
| 81I 3303 2043-49 | Left SHLD Width | 60 | 4 | 1.9 |
| 81I 3303 2044 | Right SHLD Width | 60 | 10 | 2.5 |
| 81I 3303 2044 | Right SHLD Width | 60 | 8 | 4.7 |
| 81I 3303 2043 | Right SHLD Width | 60 | 10 | 4.9 |
| 81I 3303 2045 | Right SHLD Width | 60 | 10 | 3.6 |
| 690I 3303 2028 | Right SHLD Width | 60 | 8 | 1.6 |
| 81I 3303 2046 | Right SHLD Width | 60 | 10 | 2.3 |
| 81I 3303 2048 | Right SHLD Width | 60 | 10 | 1.8 |
| 81I 3303 2050 | Right SHLD Width | 60 | 10 | 6.0 |
| 690I 3303 2024 | Right SHLD Width | 60 | 10 | 2.1 |
| 690I 3303 2024 | Left SHLD Width | 60 | 4 | 2.9 |
| 690I 3303 2025 | Right SHLD Width | 60 | 10 | 3.3 |
| 690I 3303 2025 | Left SHLD Width | 60 | 4 | 1.8 |
| 690I 3303 2026 | Left SHLD Width | 60 | 3 | 2.4 |
| 690I 3303 2026 | Right SHLD Width | 60 | 8 | 4.0 |
| 690I 3303 2027 | Right SHLD Width | 60 | 8 | 3.2 |
| 690I 3303 2028 | Left SHLD Width | 60 | 4 | 2.9 |
| 690I 3303 2028 | Left SHLD Width | 60 | 4 | 2.3 |
| 690I 3303 2028 | Right SHLD Width | 60 | 10 | 3.3 |
| 690I 3303 2030 | Right SHLD Width | 60 | 6 | 3.3 |
| 81I 3303 2049 | Grade | 60 | 4% | 4.22% |
| 81I 3303 2049 | Grade | 60 | 4% | 4.43% |
| 690I 3303 2026 | Superelevation (6% Max) | 60 | 6.0% | 4.7% |
| 690I 3303 2027 | Superelevation (6% Max) | 60 | 5.6% | 4.6% |
| 690I 3303 2028 | Superelevation (6% Max) | 60 | 4.6% | 3.9% |
| 81I 3303 2049 | Superelevation (6% Max) | 60 | 6.0% | 4.1% |
| 81I 3303 2049 | Superelevation (6% Max) | 60 | 6.0% | 4.1% |
| 81I 3303 2051 | Superelevation (6% Max) | 60 | 5.8% | 7.0% |
| 81I 3303 2051 | Superelevation (6% Max) | 60 | 5.8% | 1.1% |
| I-81 Northern Segment (3) | | | | |
| 81I 3303 2055 | Horizontal Curvature | 60 | 1330 | 1167 |

**Table 5-21**
**Existing Nonstandard Features [1]**

| Location (reference marker) | Critical Design Element (2) | Design Speed (mph) | Design Standard | Existing Condition |
|---|---|---|---|---|
| 81I 3303 2055 | Horizontal Curvature | 60 | 1330 | 1197 |
| 81I 3303 2050 | HSSD | 60 | 570 | 328 |
| 81I 3303 2050 | HSSD | 60 | 570 | 480 |
| 81I 3303 2050 | HSSD | 60 | 570 | 434 |
| 81I 3303 2051 | HSSD | 60 | 570 | 401 |
| 81I 3303 2053 | HSSD | 60 | 570 | 411 |
| 81I 3303 2054 | HSSD | 60 | 570 | 545 |
| 81I 3303 2054 | HSSD | 60 | 570 | 468 |
| 81I 3303 2055 | HSSD | 60 | 570 | 311 |
| 81I 3303 2055 | HSSD | 60 | 570 | 470 |
| 81I 3303 2056 | HSSD | 60 | 570 | 350 |
| 81I 3303 2056 | HSSD | 60 | 570 | 525 |
| 81I 3303 2057 | HSSD | 60 | 570 | 504 |
| 81I 3303 2058 | HSSD | 60 | 570 | 467 |
| 81I 3303 2059 | HSSD | 60 | 570 | 329 |
| 81I 3303 2059 | HSSD | 60 | 570 | 486 |
| 81I 3303 2160 | HSSD | 60 | 570 | 315 |
| 81I 3303 2160 | HSSD | 60 | 570 | 489 |
| 81I 3303 2161 | HSSD | 60 | 570 | 399 |
| I81 3303 2051 | VSSD | 60 | 570 | 484 |
| I81 3303 2053 | VSSD | 60 | 570 | 564 |
| I81 3303 2054 | VSSD | 60 | 570 | 550 |
| 81I 3303 2052 | Right SHLD Width | 60 | 10 | 6.0 |
| 81I 3303 2054 | Right SHLD Width | 60 | 10 | 6.9 |
| 81I 3303 2160 | Right SHLD Width | 60 | 10 | 6.3 |
| 81I 3303 2050 | Right SHLD Width | 30 (Ramp) | 6 | 0.7 |
| 81I 3303 2053 | Superelevation (6% Max) | 60 | 5.2% | 6.2% |
| 81I 3303 2053 | Superelevation (6% Max) | 60 | 5.2% | 6.6% |
| 81I 3303 2055 | Superelevation (6% Max) | 60 | 6% | 7.3% |
| 81I 3303 2055 | Superelevation (6% Max) | 60 | 6% | 7.4% |
| 81I 3303 2056 | Superelevation (6% Max) | 60 | 5.8% | 6.8% |
| 81I 3303 2056 | Superelevation (6% Max) | 60 | 5.8% | 7.3% |
| 81I 3303 2058 | Superelevation (6% Max) | 60 | 5.8% | 7.2% |
| 81I 3303 2058 | Superelevation (6% Max) | 60 | 5.8% | 7.4% |
| 81I 3303 2161 | Superelevation (6% Max) | 60 | 5.8% | 7.5% |
| 81I 3303 2161 | Superelevation (6% Max) | 60 | 5.8% | 7.0% |
| I-690/West St. Interchange Area (3) | | | | |
| 690I 3303 2024 | Horizontal Curvature | 60 | 1330 | 1146 |
| 690I 3303 2026 | Horizontal Curvature | 60 | 1330 | 1150 |
| 690I 3303 2021 | HSSD | 30 (Ramp) | 200 | 159 |
| 690I 3303 2021 | HSSD | 30 (Ramp) | 200 | 158 |
| 690I 3303 2021 | HSSD | 60 | 570 | 409 |
| 690I 3303 2021 | HSSD | 30 (Ramp) | 200 | 164 |

**Table 5-21**
**Existing Nonstandard Features [1]**

| Location (reference marker) | Critical Design Element (2) | Design Speed (mph) | Design Standard | Existing Condition |
|---|---|---|---|---|
| 690I 3303 2021 | HSSD | 30 (Ramp) | 200 | 103 |
| 690I 3303 2022 | HSSD | 30 (Ramp) | 200 | 171 |
| 690I 3303 2023 | VSSD | 60 | 570 | 509 |
| 690I 3303 2019 | Right SHLD Width | 60 | 10 | 3.2 |
| 690I 3303 2019 | Right SHLD Width | 60 | 10 | 3.2 |
| 690I 3303 2020 | Right SHLD Width | 30 (Ramp) | 6 | 1.2 |
| 690I 3303 2021 | Right SHLD Width | 60 | 10 | 6.7 |
| 690I 3303 2021 | Right SHLD Width | 60 | 10 | 7.0 |
| 690I 3303 2021 | Right SHLD Width | 30 (Ramp) | 6 | 2.3 |
| 690I 3303 2021 | Right SHLD Width | 30 (Ramp) | 6 | 3.0 |
| 690I 3303 2022 | Right SHLD Width | 30 (Ramp) | 6 | 3.3 |
| 690I 3303 2023 | Right SHLD Width | 30 (Ramp) | 6 | 4.0 |
| 690I 3303 2021 | Superelevation (6% Max) | 60 | 5.4% | 4.1% |
| 690I 3303 2021 | Superelevation (6% Max) | 460 | 5.0% | 4.1% |
| I-690 Eastern Segment (3) | | | | |
| 690I 3303 2036 | HSSD | 60 | 570 | 459 |
| 690I 3303 2037 | HSSD | 60 | 570 | 401 |
| 690I 3303 2031 | Right SHLD Width | 30 (Ramp) | 6 | 2.5 |
| 690I 3303 2035 | Left SHLD Width | 60 | 4 | 3.0 |
| 690I 3303 2035 | Left SHLD Width | 60 | 4 | 3.6 |
| 690I 3303 2037 | Right SHLD Width | 60 | 10 | 3.6 |
| 690I 3303 2037 | Right SHLD Width | 60 | 10 | 3.6 |
| 690I 3303 2030 | Superelevation (6% Max) | 60 | 4.2% | 3.0% |
| 690I 3303 2030 | Superelevation (6% Max) | 60 | 4.4% | 2.5% |
| 690I 3303 2037 | Superelevation (6% Max) | 60 | 4.8% | 3.8% |
| 690I 3303 2037 | Superelevation (6% Max) | 60 | 4.8% | 3.7% |
| 690I 3303 2036 | Median Width | 60 | 10 | 9 |
| I-481 Corridor (3) | | | | |
| 81I 3303 2013 | Horizontal Curvature | 70 | 1810 | 1572 |
| 481 3301 1003 | HSSD | 70 | 730 | 389 |
| 81I 3303 3051 | Right SHLD Width | 70 | 10 | 4.1 |
| 81I 3303 3051 | Right SHLD Width | 70 | 10 | 3.3 |
| 81I 3303 2010 | Right SHLD Width | 70 | 10 | 8.8 |
| 81I 3303 2010 | Right SHLD Width | 70 | 10 | 6.2 |
| 81I 3303 2016 | Right SHLD Width | 70 | 10 | 6.8 |
| 81I 3303 2016 | Right SHLD Width | 70 | 10 | 5.6 |
| 81I 3303 2012 | Grade | 70 | 4% | 4.8% |
| 481 3301 1000 | Grade | 70 | 4% | 5.9% |
| 481 3301 1000 | Grade | 70 | 4% | 5.8% |
| 481 3301 2146 | Superelevation (8% Max) | 70 | 8.0% | 5.3% |
| 481 3301 2146 | Superelevation (8% Max) | 70 | 8.0% | 4.4% |
| 481 3301 2146 | Superelevation (8% Max) | 40 (Ramp) | 7.8% | 4.6% |
| 481 3301 2143 | Superelevation (8% Max) | 40 (Ramp) | 6.0% | 4.2% |

**Table 5-21**
**Existing Nonstandard Features [1]**

| Location (reference marker) | Critical Design Element (2) | Design Speed (mph) | Design Standard | Existing Condition |
|---|---|---|---|---|
| 481 3301 2143 | Superelevation (8% Max) | 40 (Ramp) | 6.0% | 3.8% |
| 81I 3303 3053 | Superelevation (8% Max) | 40 (Ramp) | 7.4% | 5.1% |
| 81I 3320 1F06 | Superelevation (8% Max) | 25 (Ramp) | 7.0% | 4.8% |
| 81I 3320 1F01 | Superelevation (8% Max) | 25 (Ramp) | 6.4% | 5.8% |
| 81I 3320 1E00 | Superelevation (8% Max) | 25 (Ramp) | 7.2% | 5.6% |
| 81I 3320 1H0D | Superelevation (8% Max) | 25 (Ramp) | 7.0% | 5.4% |
| 481 3301 2146 | Superelevation (8% Max) | 25 (Ramp) | 6.4% | 5.0% |
| 81I 3320 1G00 | Superelevation (8% Max) | 25 (Ramp) | 7.0% | 6.1% |
| 81I 3320 1G02 | Superelevation (8% Max) | 25 (Ramp) | 7.0% | 6.1% |
| 481 3301 2146 | Superelevation (8% Max) | 40 (Ramp) | 6.6% | 5.4% |
| 81I 3303 3053 | Superelevation (8% Max) | 40 (Ramp) | 8.0% | 5.2% |
| 81I 3303 3058 | Superelevation (8% Max) | 40 (Ramp) | 6.6% | 6.1% |
| 81I 3303 3058 | Superelevation (8% Max) | 70 | 6.2% | 5.1% |
| 81I 3303 3058 | Superelevation (8% Max) | 70 | 6.6% | 5.2% |
| 81I 3303 2016 | Superelevation (8% Max) | 70 | 7.2% | 4.1% |

**Notes:**

1. Table includes a listing of existing geometric non-standard design features. Additionally, interstate highways with Levels of Service (LOS) = E or worse, would be considered non-standard, and are documented in Table 5-12.

2. The following abbreviations are used:

HHSD – Horizontal Stopping Sight Distance

VSSD – Vertical Stopping Sight Distance for crest vertical curves. Headlight sight distance for sag vertical curves is not included.

SHLD – Shoulder

3. For the purposes of Table 5-21, the Highway Segments are generally described as follows:

—I-81 Viaduct Area is the I-81 highway segment between MLK. Jr., East and Genesee Street.

—I-81/I-690 interchange includes I-81 between Genesee Street and Butternut Street and I-690 between Franklin Street and Almond Street

—I-81 Northern Segment is the I-81 highway section between Butternut Street and Hiawatha Boulevard

—I-690/West Street is the I-690 highway section between Leavenworth Avenue and Franklin Street

—I-690 Eastern Segment is the I-690 highway section between Catherine Street and Beech Street

—The I-481 Segment includes the southern and northern I-81/I-481 interchanges and the I-481 highway section between the two interchanges

## Non-Conforming Features

In addition to the seventeen critical design elements listed in the Design Criteria tables in **Section 5.4**, there are a number of other recommended design parameters established by NYSDOT and AASHTO that are typically used during the design of highway and bridge projects. These parameters may contribute to conditions that cause traffic congestion, reduce safety, and impede emergency response, thereby contributing to potential traffic incidents and typically include the type of the design vehicle; the Level of Service (LOS) to be provided (non-interstate roadways only); the intensity of rainfall for design of storm drainage facilities; and the length of speed change lanes (which include acceleration and deceleration lanes).

**Table 5-22** lists existing location where these other highway design elements would be considered Non-Conforming Features.

**Table 5-22**
**Existing Non-Conforming Features (1)**

| Location (milepost) | Location | Design Element | Recommended Design Standard (feet) | Existing Condition (feet) |
|---|---|---|---|---|
| I-81/I-690 Interchange (1) | | | | |
| 81I 3303 2043 | NB I-81, Almond St. EN ramp to EB I-690 EX ramp | Ramp Spacing | 1600 | 725 |
| 81I 3303 2050 | NB I-81, WB I-690 EN ramp to Pearl St. EN ramp | Ramp Spacing | 800 | 45 |
| 81I 3303 2044 | SB I-81, EB I-690 EB EN ramp to Almond St./ Harrison St. EX ramp | Ramp Spacing | 1600 | 1175 |
| 81I 3303 2050 | NB I-81, Entrance ramp merge between Pearl St. NB & SB ramp spurs | Ramp Spacing | 600 | 250 |
| 81I 3303 2051 | I-81 SB, Exit ramp split from N Clinton St. to N. Salina St. | Ramp Spacing | 600 | 300 |
| 81I 3303 2045 | SB I-81 on-ramp from I-690 EB | Ramp Lane Length | 420 | 150 |
| 81I 3303 2050 | NB I-81 on-ramp from Pearl St | Ramp Lane Length | 910 | 362 |
| I-81 Northern Segment (1) | | | | |
| 81I 3303 2053 | SB I-81, Genant Dr. EN ramp to Butternut St. EX ramp | Ramp Spacing | 1000 | 650 |
| 81I 3303 2052 | SB I-81, Butternut St. EX ramp to Clinton St./ Salina St. EX ramp | Ramp Spacing | 1000 | 450 |
| 81I 3303 2053 | NB I-81, Entrance ramp merge between N State St. & Butternut St. | Ramp Spacing | 600 | 350 |
| 81I 3303 2166 | SB Onondaga Lake Parkway Ramp, Hiawatha Blvd. (Right) EX ramp to SB I-81 (Left) EX ramp | Ramp Spacing | 800 | 360 |
| 81I 3303 2168 | SB Onondaga Lake Parkway Ramp, SB I-81 EN ramp to Hiawatha Boulevard EX ramp | Ramp Spacing | 1600 | 980 |
| 81I 3303 2053 | NB I-81 on-ramp from Butternut St./ N State St. | Ramp Lane Length | 910 | 432 |
| 81I 3303 2059 | SB I-81 on-ramp from Bear St | Ramp Lane Length | 637 | 603 |
| I-690 / West Street (1) | | | | |
| 690I 3303 2024 | I-690 WB, NB I-81 (Left) EN ramp to West St. (Right) EX ramp | Ramp Spacing | 1600 | 1074 |
| 690I 3303 2019 | I-690 EB, off-ramp split to W. Genesee St. and West St. | Ramp Spacing | 600 | 525 |
| I-481 to I-81 Conversion (1). | | | | |
| 81I 3303 3056 | NB I-81, SB I-481 EN ramp to NB I-481 EX ramp | Ramp Spacing | 2000 | 640 |
| 81I 3303 3056 | SB I-81, NB I-481 EN ramp to SB I-481 EX ramp | Ramp Spacing | 2000 | 975 |
| 81I 3303 2016 | SB I-81, S Salina St. EN ramp (right) to NB) I-481 EX ramp (Left) | Ramp Spacing | 1600 | 1561 |

**Notes:**
1. Table includes a listing of existing geometric non-conforming design features. Additionally, non-interstate highways and streets with Levels of Service (LOS) = E or worse, would be considered non-conforming, and are documented in Table 5-12.

### Pavement and Shoulder

The pavement and shoulders along I-81, I-690, I-481, and their associated ramps within the project corridor are in good condition and exhibit no major indications of pavement deterioration. NYSDOT determined that due to a number of factors, including profile changes, horizontal alignment changes, and construction phasing implications, pavement rehabilitation would not be considered, therefore an existing Pavement Evaluation study was not warranted. Further, pavement evaluation of the local street grid was deemed not warranted due to its expansiveness and the lack of definition of those streets that could become part of the Project.

### Drainage Systems

With the exception of open drainage swales at the southern and northern ends of I-81, the drainage system within the I-81 Viaduct Study Area is closed. The closed system consists of drainage inlets, bridge deck drains, manholes, and pipes. The I-81 viaduct itself drains from small inlets on the bridge deck through 6-inch-diameter pipes that are supplied through the structure to eventually connect to the street sewer system. Most of the existing drainage within the I-81 Viaduct Study Area drains toward Onondaga Creek through a system of pipes owned by the City of Syracuse and Onondaga County. The city street drainage system comprises a network of relatively small diameter pipes that lead to larger diameter county interceptor sewers. A majority of the city storm drainage system, and thus the county interceptors, handles a combination of storm water and sanitary sewage, and therefore are referred to as combined sewers. Moving from south to north along I-81, the primary drainage outlets include a 36-inch-diameter combined sewer that drains west along East Raynor Avenue, a 66-inch-diameter combined sewer that drains west along Harrison Street, a 24-inch-diameter combined sewer that drains west along Jefferson Street, a 3- by 5-foot combined sewer that drains west along Fayette Street, and a 7.5- by 10.5-foot combined sewer that drains west along Erie Boulevard. Similarly, the majority of I-690 drains into the system of combined sewers on city streets, which eventually leads to the large rectangular combined sewer on Erie Boulevard.

In addition, the section of I-81 north of I-690 drains into a series of city sewers that leads to four county interceptors, including a 72-inch combined sewer in the vicinity of E. Belden Street, a 60-inch combined sewer in the vicinity of Butternut Street, a 48-inch combined sewer in the vicinity of Bear Street, and a 33-inch combined sewer in the vicinity of Hiawatha Boulevard.

The city and county are under a consent order to reduce the frequency and volume of combined sewer overflows. The county initiated the "Save the Rain" program in 2011 intended to reduce the amount of stormwater discharged to the combined sewer system through a variety of green infrastructure and stormwater management practices. The county and city have also indicated that the I-81 Viaduct Project would need to implement practices that would result in a reduction in the overall amount of stormwater discharged to the existing combined sewer system. In addition, the section of I-81 in the vicinity of Butternut Street has a known history of roadway flooding that occurs during heavy rainfall events, primarily due to insufficient capacity of the existing combined sewer.

## Geotechnical

The City of Syracuse is located within Onondaga County on the borderline between the lake plains on the north and the Alleghany plateau on the south. The physiography of the area is intensified by glacial action with outcropping edges of many of the stratigraphic units of Paleozoic rock series (Onondaga County Website). The subsurface ground conditions along the alternative alignments were evaluated using extensive historical soil borings, which totaled over one thousand boring log records performed in the 1960s by the New York State Department of Public Works. These soil boring log records primarily concentrated along the existing bridge footprints within the I-81 Viaduct Study Area. In addition, ten new soil borings were performed in 2015 by NYSDOT at selected locations north and south of the I-690 & I-81 interchange, in areas where proposed alternative alignments were outside the coverage limits of the historical soil boring information. The subsurface conditions consist of manmade fill of variable thickness underlain by natural soils and bedrock. The subsurface strata for the proposed alignments areas, beginning at the ground surface, are described below.

Fill: Fill Stratum is composed of loose to medium dense sand and gravel with some silt and clay mixed with construction and foreign material such as cinders and fragments of concrete. The thickness of Fill Stratum can be up to 50 feet, but it generally extends to a depth of about 5 to 15 feet below existing ground.

Soft Clay/Silt: This stratum consists of very soft to soft silt and clay with some peat, muck, and marl at some locations. When encountered, this stratum was observed below Fill Stratum, and its thickness ranged from a few feet to over 60 feet (in the vicinity of Harrison Street).

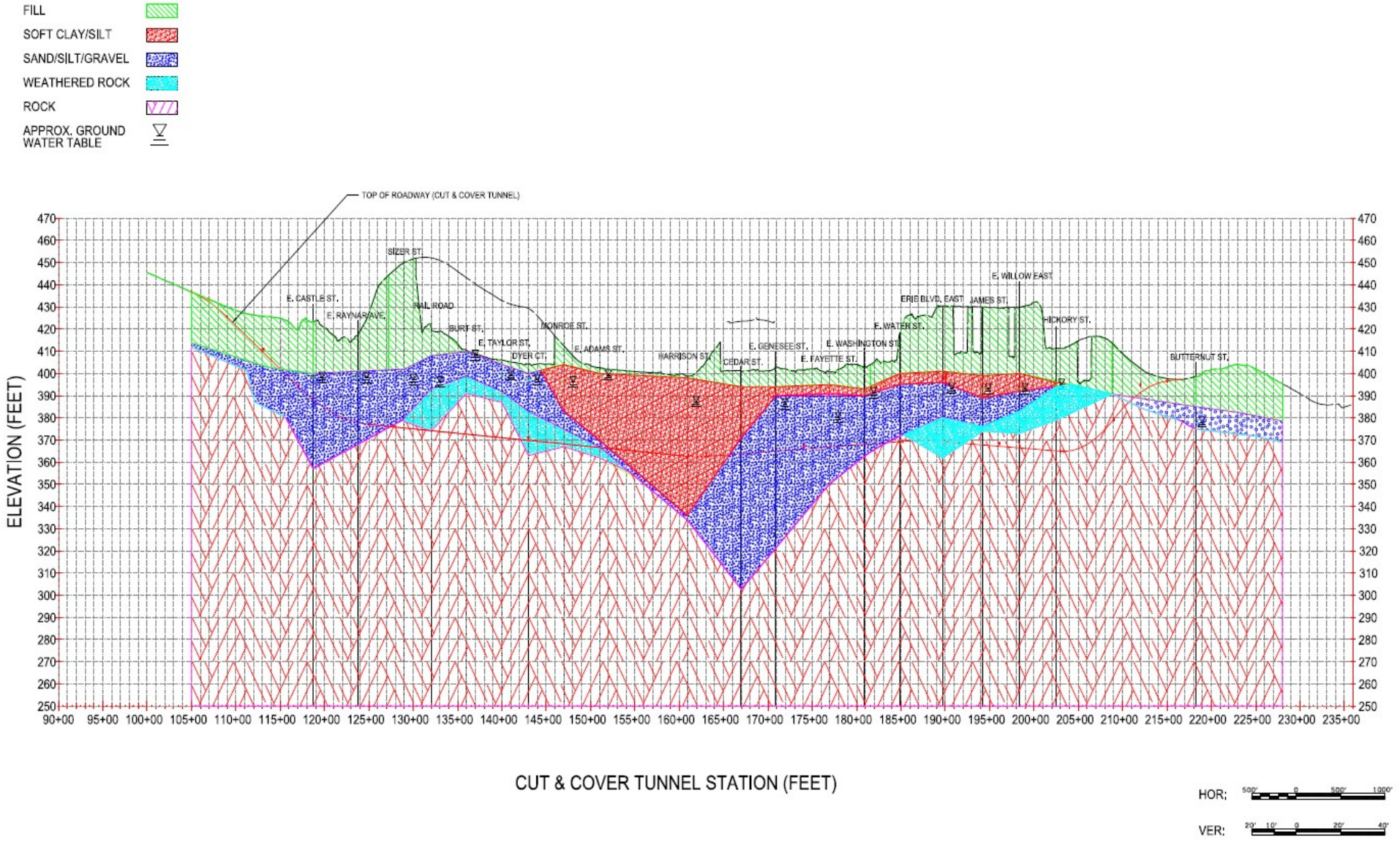
Sand/Silt/Gravel: The Sand/Silt/Gravel Stratum consists of dense to very dense mix of sand, silt, and gravel and occasional weathered rock. This stratum was encountered almost everywhere along the proposed tunnel alignment below Fill or Soft Clay/Silt Strata, and its thickness ranged from a few feet to over 60 feet around Cedar Street.

Weathered Rock: Weathered Rock stratum consists of weathered and decomposed shale mixed with sand, silt, and gravel. When encountered, this stratum was observed below Sand/Silt/Gravel Stratum and varied in thickness from a few feet to about 20 feet around Dyer Street. The determination of the top and bottom of this layer was difficult based on the available historic borings logs.

Bedrock: The Bedrock consists of shale and dolostone of Syracuse formation with occasional gypsum. The strength and weathering of the bedrock could not be quantified based on the available data. The depth of this stratum was determined based on rock cores obtained at the historic borings. This stratum was encountered below Weathered Rock or Sand/Silt/Gravel Strata. The depth to this stratum is the greatest around Cedar Street and about 100 feet. Bedrock Stratum appears to be shallower within the northern portion of the proposed alignments and deeper in the middle of the alignments. See geotechnical profile, **Figure 5-10.**

Groundwater: The reported elevation of the groundwater at the time of borings (1960s) ranged from 375 to 410 feet. Artesian water head up to 7 feet above existing grade was reported at underlying bedrock about 0.75 to 1.0 miles east of the I-81 viaduct during subsurface explorations in 2015 (NYS DOT, 2016).

12.21.16




Geotechnical Profile

**I-81 Viaduct Project**

**Figure 5-10**

South Interchange Sinkholes: Sinkholes are present at the southerly region of the I-81/I-481 South Interchange. Currently, NYSDOT is monitoring two sinkholes at the following locations:

- Area north of East Seneca Turnpike roadway, between I-81 Northbound and southbound I-81 bridges
- Area east of southbound I-81 roadway, approximately 970 feet north of East Seneca Turnpike

Study of the overall existing soil borings data and record plans indicates that the underlying soils at the Project Area generally consist of silt and clay with bedrock or shale. The depth of bedrock varies along the project alignment from approximately 20 – 70 feet below ground. As such, the placement of a new structure in the area would require the use of pile foundations to provide stability and minimize settlement of the poor soil. Piles for the new bridge would bear on bedrock where appropriate.

**Structures**

Existing bridges within the I-81 Viaduct Study Area were originally constructed during the Interstate era from the 1950's to the 1970's. The majority of the bridges are functionally obsolete and/or structurally deficient. Existing I-690 bridges, built in the 1960s, are similar. These existing bridges need to be replaced because of their overall age, condition, functionality, as well as geometric deficiencies. Existing bridges in the I-481 South Study Area, the I-481 East Study Area and the I-481 North Study Area are more modern structures and have fewer structural and functional deficiency needs.

The I-81 Corridor Study provided a detailed assessment of bridge ratings in the I-81 Viaduct Study Area. Of the nearly 50 bridges within the I-81 Viaduct Study Area, seven bridges are classified as structurally deficient and approximately 20 bridges are classified as functionally obsolete per FHWA standards. Over 25 bridges meet the NYSDOT "deficient" condition rating of less than 5.000 (see **Table 1-2**).

Considering the level of capital investment needed where more long-term solutions are deemed necessary to correct structural deficiencies, NYSDOT determines whether bridges can achieve desirable lifespans through rehabilitation or whether replacement is required. Based on the evaluation of the bridges within the I-81 Viaduct Study Area, NYSDOT recommended replacement of all of the bridges in the viaduct and I-81/I-690 interchange, except for recently constructed bridges, which would be evaluated for rehabilitation.

In order to have a better understanding of the structural condition of existing bridges outside of the I-81 viaduct and the I-81/I-690 interchange area, the NYSDOT Biennial bridge inspection reports were reviewed to assess the overall bridge conditions and identify additional evaluations that should be conducted. Based on this review, an in-depth bridge inspection program was developed to determine existing bridge conditions and to establish the rehabilitation work that may be necessary. As part of the in-depth bridge inspection program, deck evaluation, seismic screening & fatigue evaluation were also performed. The existing bridges inspected were located primarily along the I-481 corridor, between north and south interchanges, where rehabilitation or reconstruction of bridges would need to be evaluated as

part of the proposed Community Grid Alternative. Bridges in the I-81 Viaduct Study Area were not included in the in-depth inspection because under both build alternatives, the magnitude of the alignment changes coupled with the deteriorated condition of the existing bridges, resulted in a decision that all bridges would be replaced completely to meet the current design standards. Because of the in-depth inspection, rehabilitation of existing bridges along the I-481 corridor was determined to be cost effective. It was also determined that any bridges that need to be widened as a result of this Project would be rehabilitated as part of this Project and the remaining bridges along I-481 would be addressed by the NYSDOT maintenance program. **Table 5-23** provides a list of the existing bridges inspected as well as the types of evaluations performed. A summary copy of the more detailed In-depth inspection reports is included in **Appendix A-2**.

**Table 5-23**
**Existing Bridge Inspections and Evaluations**

| BIN No. | Locations | Work Completed | | | | |
|---|---|---|---|---|---|---|
| | | In-Depth Inspection | Load Rating | Seismic Assessment | Fatigue Evaluation | Deck Evaluation |
| 1002131 | I-481 Southbound over NYS Routes 5 & 92 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1002132 | I-481 Northbound over NYS Routes 5 & 92 | ✓ | ✓ | ✓ | ✓ | |
| 1031501 | I-81 Northbound and Southbound over State Route 173 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1031510 | East Glen Avenue over I-81 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1031539 | I-81 Northbound & Southbound over Brighton Ave | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1031610 | Hiawatha Boulevard over I-81 | ✓ | ✓ | ✓ | | ✓ |
| 1031711 | I-481 Southbound over I-81 | ✓ | ✓ | ✓ | | ✓ |
| 1031712 | I-481 Northbound over I-81 | ✓ | ✓ | ✓ | | ✓ |
| 1044440 | I-481 EB & WB over Butternut Creek | ✓ | | | | |
| 1049659 | I-690 over Hiawatha Blvd | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1050759 | I-690 over North Geddes Street | ✓ | ✓ | ✓ | ✓ | |
| 1050779 | I-690 over Leavenworth Avenue | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1051159 | I-690 over Peat Street | ✓ | | ✓ | ✓ | |
| 1051160 | Midler Avenue over I-690 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1053931 | I-690 Westbound over Bear Street Extension | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1053932 | I-690 Eastbound over Bear Street Extension | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1053941 | I-690 Westbound over Liberty Street | ✓ | ✓ | ✓ | ✓ | ✓ |

**Table 5-23**
**Existing Bridge Inspections and Evaluations**

| BIN No. | Locations | Work Completed | | | | |
|---|---|---|---|---|---|---|
| | | In-Depth Inspection | Load Rating | Seismic Assessment | Fatigue Evaluation | Deck Evaluation |
| 1053942 | I-690 Eastbound over Liberty Street | ✓ | ✓ | ✓ | ✓ | |
| 1053969 | I-690 over Van Rensselaer Street | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1064650 | Kinne Road over I-481 Northbound and Southbound | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1064689 | Thompson Road (Route 635) over I-690 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1064691 | I-690 WB over Bridge Street | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1064692 | I-690 EB over Bridge Street | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069090 | I-481 SB over I-81 NB & SB | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069100 | I-81 SB to I-481 EB Ramp over I-81 NB | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069110 | Brighton Avenue over I-481 Northbound | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069120 | Brighton Avenue over I-481 Southbound | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069131 | I-481 Southbound over Driveway to Quarry Road | ✓ | ✓ | ✓ | | ✓ |
| 1069132 | I-481 Northbound over Driveway to Quarry Road | ✓ | ✓ | ✓ | | ✓ |
| 1069141 | I-481 Southbound over NY Susquehanna & W Railroad | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069142 | I-481 EB over NY Susquehanna & W | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069151 | I-481 Southbound over Jamesville Road | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069152 | I-481 Northbound over Jamesville Road | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1069160 | ENT. To I-481 WB over Butternut Creek | ✓ | ✓ | | | |
| 1069170 | EXT. from I-481 EB over Butternut Creek | ✓ | ✓ | | | |
| 1031529 | I-81 over E. Calthrop Avenue | ✓ | ✓ | ✓ | ✓ | |
| 1031549 | I-81 over East Colvin Street | ✓ | ✓ | ✓ | ✓ | |
| 1031559 | I-81 over East Castle Street | ✓ | ✓ | ✓ | ✓ | |
| 1051081 | I-690 Westbound over CSX | ✓ | ✓ | ✓ | ✓ | ✓ |

**Table 5-23**
**Existing Bridge Inspections and Evaluations**

| BIN No. | Locations | Work Completed | | | | |
|---|---|---|---|---|---|---|
| | | In-Depth Inspection | Load Rating | Seismic Assessment | Fatigue Evaluation | Deck Evaluation |
| | TRANS/Peat St | | | | | |
| 1051082 | I-690 Eastbound over CSX TRANS/Peat St | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1051120 | I-481 Northbound over I-690 EB Connection (Future) | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1072530 | From/to I90 over I481 OVER I481 | ✓ | ✓ | ✓ | | ✓ |
| 1072571 | I-481 Southbound over Route 298 | ✓ | ✓ | ✓ | | ✓ |
| 1072572 | I-481 Northbound over Route 298 | ✓ | ✓ | ✓ | | ✓ |
| 1072581 | I-481 Southbound over Taft Road | ✓ | ✓ | ✓ | | ✓ |
| 1072582 | I-481 Northbound over Taft Road | ✓ | ✓ | ✓ | | ✓ |
| 1072591 | I-481 Southbound over Northern Blvd. | ✓ | ✓ | ✓ | | ✓ |
| 1072592 | I-481 Northbound over Northern Blvd. | ✓ | ✓ | ✓ | | ✓ |
| 1072781 | I-481 Southbound over Totman Road | ✓ | ✓ | ✓ | | ✓ |
| 1072782 | I-481 Northbound over Totman Road | ✓ | ✓ | ✓ | | ✓ |
| 1072791 | I-481 Northbound over Thompson Road | ✓ | ✓ | ✓ | | ✓ |
| 1072792 | I-690 Eastbound Ramp (Future) over I-481 Southbound | ✓ | ✓ | ✓ | | ✓ |
| 1093510 | I-690 EB Ramp to I-481 NB over I-481 SB | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1093520 | I-481 Southbound over I-481 NB to I-690 WB Ramp | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1093530 | I-690 EB to I-481 NB Ramp over I-481 NB to I-690 WB Ramp | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1093540 | I-481 Northbound over Connection to I-690 Westbound | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1093550 | I-481 Southbound over NYS Rt. 290 | ✓ | ✓ | ✓ | ✓ | |
| 1093561 | I-481 Southbound over NYS Rt. 290 | ✓ | ✓ | ✓ | | ✓ |
| 1093562 | I-481 Northbound over NYS Rt. 290 | ✓ | ✓ | ✓ | | |
| 1093571 | I-481 Southbound over | ✓ | ✓ | ✓ | ✓ | ✓ |

**Table 5-23**
**Existing Bridge Inspections and Evaluations**

| BIN No. | Locations | Work Completed | | | | |
|---|---|---|---|---|---|---|
| | | In-Depth Inspection | Load Rating | Seismic Assessment | Fatigue Evaluation | Deck Evaluation |
| | CSX TRANS/AMTRAK | | | | | |
| 1093572 | I-481 Northbound over CSX TRANS/AMTRAK | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1093671 | I-481 Southbound over Kirkville Road | ✓ | ✓ | ✓ | | ✓ |
| 1093672 | I-481 Northbound over Kirkville Road | ✓ | ✓ | ✓ | | |
| 1093681 | I-481 Southbound over I-90 | ✓ | ✓ | ✓ | | ✓ |
| 1093682 | I-481 Northbound over I-90 | ✓ | ✓ | ✓ | | ✓ |

### In-depth Inspection

As shown in Table 5-23, and as part of the in-depth bridge inspection program, 65 bridges were further evaluated along the I-481 corridor and at select locations on I-690 and I-81. Visual and hands-on inspections were performed by walking, ladder, bucket truck or Under Bridge Inspection Unit (UBIU) where required. All bridge superstructure and substructure components were evaluated to determine the extent of deterioration or any structural deficiencies. Furthermore, 100% hands on inspection of fatigue prone elements were inspected. Concrete spalled and delamination at the deck, pier, and abutments were documented. Existing girders were inspected for section loss and deteriorations. The In-depth bridge inspection indicated that existing bridges generally have minor to moderate deteriorations at the deck and substructures elements, whereas steel girders were generally in satisfactory condition with no substantial section loss. Maintenance and repairs would be required to eliminate these deficiencies and restore these existing bridges in good state of repair.

### Load Rating

The Level one load ratings were performed in accordance with AASHTO Manual for Bridge Evaluation, NYSDOT bridge manual, and NYSDOT Engineering Instruction number EI05-034. Existing bridge inventory and operating rating of H20, HS20, and alternate military vehicles loading capacity were determined by using AASHTOWARE bridge rating program and MDX for straight and curved girder respectively. Updated information since the last inspection, such as newly added overlay, bridge appurtenances, and section loss found, if any, during the In-depth inspection were incorporated to assess the bridge rating capacity. All existing bridges exhibited satisfactory rating and capacity, except BIN 1069170 - EB I-481 exit over Butternut Creek (culvert). The inventory level rating of BIN 1069170 was lower than unity. However, operating level rating was satisfactory. Therefore, no load posting is required.

### Seismic Assessment

The seismic assessment was performed in accordance with FHWA Seismic Retrofitting Manual for Highway Structures. The purpose of the assessment is to determine if seismic

retrofits are warranted at the superstructure to substructure connection or further seismic evaluation of the structure at locations such as bearings, pedestals width, and abutment seat width would be required. The seismic assessment shown retrofit category, components require seismic retrofit, and recommendations for further lower and upper level ground motion seismic evaluation. There are 14 out of 65 existing bridges would require abutment/pier seat width improvement.

**Fatigue Analysis**

Fatigue evaluation was conducted to assess the remaining life of fatigue-prone wielding components located at girder cover plates and diaphragm connection plates. Specifically, existing bridge with AASHTO Category D, E, and E' fatigue-prone details require 100% hands-on inspection unless proven to be exempt. The fatigue evaluation was performed in accordance with the AASHTO Guide Specification for Fatigue Evaluations of Existing Steel Bridges, 1990. Fatigue-prone welds identified in the biennial inspection reports were located on record drawings and confirmed visually in the field. Additional information concerning fatigue-prone welds located in BIN folders was also obtained and reviewed prior to inspection. Fatigue-prone details would require routine inspection to ensure the integrity of the structure until these details are repaired or eliminated. There are 26 out of 65 existing bridges exhibited fatigue-prone details with exhausted remaining safe fatigue life.

**Deck Evaluation**

A deck evaluation was performed to document and determine existing conditions of the bridge decks. Any existing bridge decks that rated 5 or better (based on latest bridge inspection report available at the time of field inspection) received a deck evaluation and inspection, as well as selected deck coring. The deck evaluations were performed in accordance with NYSDOT Bridge Deck Evaluation Manual. Tests performed on the concrete cores included compressive strength and chloride-ion content in accordance with ASTM C42-13 and AASHTO T 260-97 (2005), respectively. The coring samples testing results showed that overall existing concrete decks compressive strength was greater than 3000 PSI and chloride-ion content exceeded allowable 1.3 lb/cy of concrete. 1.3 lb/cy of concrete is the level at which accelerated rates of steel corrosion could occur, especially when moisture is present. Based on the deck evaluation findings, deck options were considered including deck overlay, partial depth reconstruction, and complete deck replacement. Existing bridge deck with susceptible high chloride-ion content is recommended to be rehabilitated or replaced. New deck would extend the life expectancy of the structure and mitigate excessive future maintenance costs.

Refer to **Appendix A-2** for more detailed information of individual bridge In-depth inspection, load rating, seismic assessment, fatigue analysis, and deck evaluation.

**Hydraulics of Bridges and Culverts**

While the Project includes a large number of bridges, only a few bridges span a watercourse. The I-690 bridges and associated West Street interchange ramps span Onondaga Creek, and the proposed bridge pier locations for both alternatives may infringe on the 100-year flood boundary. Due to the high elevation of the existing bridges over the creek, and that there are

no known hydraulic issues associated with the existing bridges in this area, a hydraulic analysis will not be required until design advances.

### Guide Railing, Median Barriers and Impact Attenuators

Due to the size of the Project Area, the large number of lane miles, and the urban nature of the I-81 Viaduct Study Area, there are extensive lengths of concrete barrier, concrete median barrier, impact attenuators and steel guiderail. There are no known issues or problems with the existing guiderail systems, but because of the extensive amount of reconstruction, it is anticipated all barrier systems and impact attenuators within the project limits would be replaced.

### Utilities

Because of the urban nature and size of the Project Area, there are an extensive number and network of utilities, both private and public, above ground and below ground. A summary of the utilities and utility owners is included in **Table 5-24**. See **Tables 5-55** and **5-82** for a more detailed summary of potential utility conflicts for each design alternative.

**Table 5-24**
**Existing Utilities**

| Owner | Type |
|---|---|
| Onondaga County Department of Environmental Protection (OCDWEP) | Sanitary Sewers, Combined Sewers, Sanitary Force Mains & Storm Sewers |
| Onondaga County Water Authority (OCWA) | Water Transmission mains |
| City of Syracuse | Sanitary Sewer, Combined Sewers, Storm Sewers, Water |
| Syracuse University | Underground Telephone |
| Syracuse University | Underground Steam, Condensate and Chilled Water Service & Return Lines |
| Alliance | Natural Gas Pipelines |
| National Grid | Natural Gas Pipelines, Underground Electric, Overhead Electric |
| AT&T | Underground Fiber Optic |
| Verizon | Underground Fiber Optic Underground Telephone |
| Windstream | Underground Fiber Optic |
| Elantic | Underground Fiber Optic, Overhead Fiber Optic |
| Light Tower | Underground Fiber Optic, Underground Telephone |
| Level 3 Com | Underground Fiber Optic |
| Time Warner Cable | Underground Cable TV |

### Railroad Facilities

CSX Railroad – The two-track CSX railroad mainline is located on the north side of the city of Syracuse and generally operates east-west. The only potential crossing of the CSX mainline that may be impacted by this Project is located in the I-481 East Study Area where I-481 spans the CSX rail yard, north of the I-690 interchange.

Amtrak – Amtrak railroad utilizes the CSX mainline, providing intercity passenger service, including regular scheduled service to the Syracuse Amtrak station. As noted above, the

Syracuse Amtrak station is located in the northeastern corner of the I-81 Viaduct Study Area at the William F Walsh Regional Transportation Center.

New York, Susquehanna & Western Railway (NYS&W) – NYS&W operates a freight railroad that runs primarily south from Syracuse toward Binghamton. The southern end of the existing I-81 viaduct spans the NYS&W single-track mainline. A short distance to the south, the NYS&W spans Renwick Avenue.

## POTENTIAL ENHANCEMENT OPPORTUNITIES

### Landscape

*Terrain*

The majority of the I-81 Viaduct Study Area is located in an urban environment and the Project Area along the I-481corridor can be characterized as suburban environment. The terrain in the overall Project Area is rolling, with portions of the Project Area in Downtown Syracuse exhibiting less topographic change because of its position in the Onondaga Lake plain.

*Unusual Weather Conditions*

The Project Area is subject to lake effect snow conditions.

*Visual Resources*

Visual resources within the project site and surrounding area are described in Section 6.4.3 of the DEIS.

### Opportunities for Environmental Enhancements

As discussed in **Section 5.5 and 5.6**, the Viaduct Alternative and the Community Grid Alternative both provide opportunities for pedestrian and bicycle accommodation and safety improvements and aesthetic enhancements to the general area. Streetscape and gateway enhancements will be considered as part of the design and are described in **Section 5.5 (Viaduct) Environmental Enhancements and Section 5.6 (Community Grid) Environmental Enhancements.**

## 5.4 DESIGN CRITERIA FOR REASONABLE ALTERNATIVE(S)

## 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 (BM)
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities 4th edition (2012)
- AASHTO A Policy on Geometric Design of Highways and Streets 6th edition (2011)

- AASHTO Roadside Design Guide 4th edition (2011)

## CRITICAL DESIGN ELEMENTS

The design criteria applicable to the project roadways consisted of 17 critical design elements as described in the NYSDOT HDM (Chapter 2). Other controlling parameters, such as acceleration lane length, are found in AASHTO's *A Policy on Geometric Design of Highways & Streets* (2011). A list of the critical design elements follows.

**Critical Design Elements**

| | | | |
|---|---|---|---|
| 1 | Design Speed | 10 | Vertical Clearance |
| 2 | Lane Width | 11 | Pavement Cross Slope |
| 3 | Shoulder Width | 12 | Rollover* |
| 4 | Bridge Roadway Width | 13 | Structural Capacity |
| 5 | Maximum Grade | 14 | Level of Service (Interstate mainline and ramps only) |
| 6 | Horizontal Curvature | 15 | Control of Access |
| 7 | Superelevation Rate | 16 | Pedestrian Accommodation |
| 8 | Stopping Sight Distance | 17 | Median Width |
| 9 | Horizontal Clearance | | |

* Change of grade between cross slope of adjacent lanes or between travel lanes and shoulder.

The critical design element **Tables 25A** through **25R** for each specific type of highway, including expressway ramps and local streets that are impacted by this Project, are included below.

| TABLE 25A - DESIGN CRITERIA FOR I-81, VIADUCT ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | I-81, I-481 south interchange to Hiawatha Blvd. | | **Functional Classification:** | Urban Principal Arterial - Interstate |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Interstate |
| **% Trucks:** | | 13% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 134,500 | | **Truck Access/Qualifying:** | Qualifying Highway |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 60 mph (1) | 60 mph | 60 mph | HDM § 2.7.1.1.A |
| 2 | Travel Lane Width (Min.) | 12 ft | 12 ft | 12 ft | HDM § 2.7.1.1.B |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | <br>10 ft<br>4 ft | <br>2-4ft*<br>2-4ft* | <br>10 ft (4)<br>4 ft (4) | HDM § 2.7.1.1.C<br>Exhibit 2-2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width: | <br>12 ft<br>10 ft Min.<br>4 ft Min. | <br>12 ft<br>2.1 ft Min<br>2.8 ft Min | <br>12 ft<br>10 ft Min (4)<br>4 ft Min (4) | HDM § 2.7.1.1.D<br>NYSDOT Brg. Man. § 2.3.1 |
| 5 | Grade (Max.) | 4% | 4 % | 4% | HDM § 2.7.1.1.E<br>Exhibit 2-2 |
| 6 | Horizontal Curvature (Min. Radius) | 1330 ft @ 6% | 1054 ft* | 1330 ft @ 6% | HDM § 2.7.1.1.F<br>Exhibit 2-2 |
| 7 | Superelevation (Max.) | 6% | 7.5% | 6% | HDM § 2.7.1.1.G |
| 8 | Stopping Sight Distance (Min.) | 570 ft | 259 ft* | 426 ft (5) | HDM § 2.7.1.1.H<br>Exhibit 2-2 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | <br>15 ft<br>Greater of Shld. Width or 4 ft | <br>17 ft<br>3.1 ft | <br>15 ft<br>Greater of Shld. Width or 4 ft | HDM § 2.7.1.1.I |
| 10 | Vertical Clearance | 14 ft Min. (2, 3)<br>14.5 ft Desired | 14 ft (Min.) | 14 ft Min. (2, 3))<br>14.5 ft Desired | HDM § 2.7.1.1.J /<br>NYSDOT Brg. Man. § 2.4.1 Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.1.1.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld. Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.1.1.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | H20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.1.1.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service (LOS) | C, may be D if heavy development necessitates | Varies | D | HDM § 2.7.1.1.N |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.1.1.O /<br>HDM § 6.2 |
| 16 | Pedestrian Accommodation | Not Allowed | Not Allowed | Not Allowed | |
| 17 | Median Width (Min.) | 10 ft | 8 ft* | 10 ft | HDM § 2.7.1.1.P |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 60 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 16-ft clearance exemption. I-481 is the designated 16-ft route

3 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater

4 On inside of horizontal curves, the proposed shoulder width varies to 12 feet maximum to meet Horizontal Stopping Sight Distance criteria.

5 Proposed Horizontal Stopping Sight Distance is non-standard along four curves in the I-81/I-690 interchange area (See Non-Standard Feature Justification Forms). All other locations meet design criteria of 570 feet minimum.

| TABLE 25B - DESIGN CRITERIA FOR I-690, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | I-690, Leavenworth Ave. to Beech Street | | **Functional Classification:** | Urban Principal Arterial - Interstate |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Interstate |
| **% Trucks:** | | 9% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 111,900(V), 127,400 (CG)- | | **Truck Access/Qualifying:** | Qualifying Highway |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 60 mph (1) | 60 mph | 60 mph | HDM § 2.7.1.1.A |
| 2 | Travel Lane Width (Min.) | 12 ft | 12 ft | 12 ft | HDM § 2.7.1.1.B |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | 10 ft<br>4 ft | 3.2 ft*<br>1.8 ft* | 10 ft (4)<br>4 ft (4) | HDM § 2.7.1.1.C<br>Exhibit 2-2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width: | <br>12 ft<br>10 ft Min.<br>4 ft Min. | <br>12 ft<br>3.2 ft Min<br>1.8 ft Min | <br>12 ft<br>10 ft Min (4)<br>4 ft Min (4) | HDM § 2.7.1.1.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 4% | 4% | 4% | HDM § 2.7.1.1.E<br>Exhibit 2-2 |
| 6 | Horizontal Curvature (Min. Radius) | 1330 ft @ 6% | 1150 ft* | 1330 ft @ 6% | HDM § 2.7.1.1.F<br>Exhibit 2-2 |
| 7 | Superelevation (Max.) | 6% | 6% | 6% | HDM § 2.7.1.1.G |
| 8 | Stopping Sight Distance (Min.) | 570 ft | 302 ft* | 509 ft (5) | HDM § 2.7.1.1.H<br>Exhibit 2-2 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | <br>15 ft<br>Greater of Shld. Width or 4 ft | <br>29 ft<br>1.8 ft | <br>15 ft<br>Greater of Shld. Width or 4 ft | HDM § 2.7.1.1.I |
| 10 | Vertical Clearance | 14 ft Min. (2, 3)<br>14.5 ft Desired | 14 ft (Min.) | 14 ft Min.(2, 3)<br>14.5 ft Desired | HDM § 2.7.1.1.J /<br>NYSDOT Brg. Man. § 2.4.1, Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.1.1.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld. Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.1.1.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | H20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.1.1.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | C, may be D if heavy development necessitates | Varies | D | HDM § 2.7.1.1.N |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.1.1.O /<br>HDM § 6.2 |
| 16 | Pedestrian Accommodation | Not Allowed | Not Allowed | Not Allowed | |
| 17 | Median Width (Min.) | 10 ft | 9 ft* | 10 ft | HDM § 2.7.1.1.P |

* Nonstandard feature

Notes

1. The Regional Traffic Engineer has concurred that the use of a Design Speed of 60 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.
2. 16-ft clearance exemption. I-481 is the designated 16-ft route
3. The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater
4. On inside of horizontal curves, the proposed shoulder width varies to 12 feet maximum to meet Horizontal Stopping Sight Distance criteria.
5. Proposed Horizontal Stopping Sight Distance is non-standard along one curve in the I-81/I-690 interchange area (See Non-Standard Feature Justification Forms). All other locations meet design criteria of 570 feet minimum.

**TABLE 25C - DESIGN CRITERIA FOR FORMER I-81 NORTHERN SEGMENT, COMMUNITY GRID ALTERNATIVE**

| | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | Former I-81 Northern Segment, Butternut St. to Hiawatha Boulevard | | **Functional Classification:** | Urban Principal Arterial - Interstate |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Interstate |
| **% Trucks:** | | 9% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 114,300 | | **Truck Access/Qualifying:** | Qualifying Highway |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 60 mph (1) | 60 mph | 60 mph | HDM § 2.7.1.1.A |
| 2 | Travel Lane Width (Min.) | 12 ft | 11-12 ft* | 12 ft | HDM § 2.7.1.1.B |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | <br>10 ft<br>4 ft | <br>6 ft*<br>4 ft | <br>10 ft (4)<br>4 ft (4) | HDM § 2.7.1.1.C<br>Exhibit 2-2 |
| 4 | Bridge Roadway Width | N/A | N/A | N/A | HDM § 2.7.1.1.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 4% | 4% | 4% | HDM § 2.7.1.1.E<br>Exhibit 2-2 |
| 6 | Horizontal Curvature (Min. Radius) | 1330 ft @ 6% | 1167 ft* | 1330 ft @ 6% | HDM § 2.7.1.1.F<br>Exhibit 2-2 |
| 7 | Superelevation (Max.) | 6% | 6% | 6% | HDM § 2.7.1.1.G |
| 8 | Stopping Sight Distance (Min.) | 570 ft | 311 ft* | 570 ft | HDM § 2.7.1.1.H<br>Exhibit 2-2 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | <br>15 ft<br>Greater of Shld. Width or 4 ft | <br>17 ft<br>4 ft | <br>15 ft<br>Greater of Shld. Width or 4 ft | HDM § 2.7.1.1.I |
| 10 | Vertical Clearance | 14 ft Min. (2, 3)<br>14.5 ft Desired | 14 ft (Min.) | 14 ft Min. (2, 3)<br>14.5 ft Desired | HDM § 2.7.1.1.J /<br>NYSDOT Brg. Man. § 2.4.1<br>Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.1.1.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.1.1.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | H20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.1.1.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | C, may be D if heavy development necessitates | Varies | D | HDM § 2.7.1.1.N |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.1.1.O /<br>HDM § 6.2 |
| 16 | Pedestrian Accommodation | Not Allowed | Not Allowed | Not Allowed | |
| 17 | Median Width (Min.) | 10 ft | 6 ft* | 10 ft | HDM § 2.7.1.1.P |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 60 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 16-ft clearance exemption. New I-81 is the designated 16-ft route

3 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater

4 On inside of horizontal curves, the proposed shoulder width varies to 12 feet maximum to meet Horizontal Stopping Sight Distance criteria.

**TABLE 25D - DESIGN CRITERIA – NEW I-81 (FORMER I-481), COMMUNITY GRID ALTERNATIVE**

| | | | | | |
|---|---|---|---|---|---|
| **PIN:** | 3501.60 | | **NHS (Y/N):** | Yes | |
| **Route No. & Name:** | Redesignated I-81 (Former I-481) | | **Functional Classification:** | Urban Principal Arterial - Interstate | |
| **Project Type:** | Reconstruction | | **Design Classification:** | Interstate | |
| **% Trucks:** | 6% | | **Terrain:** | Rolling | |
| **ADT (2050):** | 56,800 | | **Truck Access/Qualifying:** | Qualifying Highway | |

| | DESIGN ELEMENT | STANDARD CRITERIA | EXISTING CONDITION | PROPOSED CONDITION | REFERENCE |
|---|---|---|---|---|---|
| 1 | Design Speed (Min.) | 70 mph (1) | 70 mph | 70 mph | HDM § 2.7.1.1.A |
| 2 | Travel Lane Width (Min.) | 12 ft | 12 ft | 12 ft | HDM § 2.7.1.1.B |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | 10 ft<br>4 ft | 10 ft<br>4 ft | 10 ft (3)<br>4 ft (3) | HDM § 2.7.1.1.C<br>Exhibit 2-2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width | 12 ft<br>10 ft Min.<br>4 ft Min. | 12 ft<br>3.3 ft Min<br>4 ft Min | 12 ft<br>10 ft Min (3)<br>4 ft Min (3) | HDM § 2.7.1.1.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 4% | 5.0%* | 4% | HDM § 2.7.1.1.E<br>Exhibit 2-2, |
| 6 | Horizontal Curvature (Min. Radius) | 1810 ft @ 8% | 1572 ft* | 1810 ft @ 8% | HDM § 2.7.1.1.F<br>Exhibit 2-2 |
| 7 | Superelevation (Max.) | 8% | 8% | 8% | HDM § 2.7.1.1.G |
| 8 | Stopping Sight Distance (Min.) | 730 ft | 389 ft* | 524 ft (4) | HDM § 2.7.1.1.H<br>Exhibit 2-2 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 15 ft<br>Greater of Shld. Width or 4 ft | 30 ft<br>3.3 ft | 15 ft<br>Greater of Shld. Width or 4 ft | HDM § 2.7.1.1.I |
| 10 | Vertical Clearance | 16 ft Min.(2)<br>16.5 ft Desired | 16 ft (Min.) | 16 ft Min. (2)<br>16.5 ft Desired | HDM § 2.7.1.1.J /<br>NYSDOT Brg. Man. § 2.4.1<br>Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.1.1.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.1.1.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | H20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.1.1.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | C | Varies | C | HDM § 2.7.1.1.N |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.1.1.O /<br>HDM § 6.2 |
| 16 | Pedestrian Accommodation | Not Allowed | Not Allowed | Not Allowed | |
| 17 | Median Width (Min.) | 10 ft. Min. | Varies<br>18'-140' | 10 ft Min. | HDM § 2.7.1.1.P |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 70 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater

3 On inside of horizontal curves, the proposed shoulder width varies to 12 feet maximum to meet Horizontal Stopping Sight Distance criteria.

4 Proposed Horizontal Stopping Sight Distance is non-standard along two curves in the south interchange area (See Non-Standard Feature Justification Forms). All other locations meet design criteria of 730 feet minimum.

| TABLE 25E - DESIGN CRITERIA, INTERSTATE DIRECT CONNECTOR RAMPS, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | Interstate Direct Connector Ramps (1) | | **Functional Classification:** | Urban Principal Arterial - Interstate |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Ramp (Direct Connection) |
| **% Trucks:** | | Varies | | **Terrain:** | Rolling |
| **ADT (2050):** | | Varies | | **Truck Access/Qualifying:** | Qualifying Highway |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING (3) CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 40 mph (2) | 40 mph | 40 mph | HDM § 2.7.5.2.A |
| 2 | Travel Lane Width (Min.) | 15 ft (1 lane,<1000ft radius) (4) | 16 ft. | 15 ft(1 lane,<1000ft radius) (4) | HDM § 2.7.5.2.B Exhibit 2-9.a |
| 3 | Shoulder Width (Min.)-Right<br>Left | 6 ft<br>3 ft | 5 ft*<br>9 ft | Varies 8-14 ft (5, 6)<br>3 ft (6) | HDM § 2.7.5.2.C Exhibit 2-10 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width | <br>15 ft (4)<br>6 ft Min.<br>3 ft Min. | <br>16 ft<br>5 ft<br>9 ft | <br>15 ft (4)<br>14 ft Min (5)<br>3 ft Min (5) | HDM § 2.7.5.2.D NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 6% | 1.5% | 6% | HDM § 2.7.5.2.E Exhibit 2-10 |
| 6 | Horizontal Curvature (Min. Radius) | 485 ft @ 6% | 460 ft. | 580 ft Min. | HDM § 2.7.5.2.F Exhibit 2-10 |
| 7 | Superelevation (Max.) | 6% | 6.5% | 6% | HDM § 2.7.5.2.G |
| 8 | Stopping Sight Distance (Min.) | 305 ft | 225 ft. | 305 ft | HDM § 2.7.5.2.H Exhibit 2-10 |
| 9 | Horizontal Clearance, Right<br>Left | Shoulder width or 6 ft (min)<br>3ft (min) | 5 ft<br>9 ft. | Shoulder width or 6 ft (min)<br>3ft (min) | HDM § 2.7.5.2.I |
| 10 | Vertical Clearance | 14 ft Min. (7)<br>14.5 ft Desired | 14 ft Min. | 14 ft Min. (7)<br>14.5 ft Desired | HDM § 2.7.5.2.J / NYSDOT Brg. Man. § 2.4.1, Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0%- | 1.5% / 2.0% | HDM § 2.7.5.2.K |
| 12 | Rollover (Max.) -<br>Between Lanes<br>At Edge of Trvld Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.5.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.5.2.M NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | C, may be D if heavy development necessitates | Varies | D | HDM § 2.7.5.2.N |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.5.2.O / HDM § 6.2 |
| 16 | Pedestrian Accommodation | Not Allowed | Not Allowed | Not Allowed | |
| 17 | Median Width (Min.) | N/A | N/A | N/A | |

* Nonstandard feature

Notes

1 This table applies to six connector ramps, SB I-81 to WB I-690, SB I-81 to EB I-690 (CG Alternative only), EB I-690 to SB I-81, EB I-690 to NB I-81, NB I-81 to EB I-690 and WB I-690 to SB I-81.

2 The Regional Traffic Engineer has concurred that the use of a Design Speed of 40 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

3 Existing values based on existing NB I-81 to EB I-690 connector ramp.

4 Lane width based on right and left shoulders being full depth, widths meet or exceed the minimum shoulder widths from Exhibit HDM 2-10 and the cross slope of traveled way and shoulders is on a single plane with no rollover.

5 On inside of curves, the proposed shoulder width varies from 8 feet to 14 feet maximum to meet HSSD criteria along the horizontal curve and to match abutting highway shoulders on the SB I-81 to WB I-690 ramp and to accommodate higher speed transition areas abutting the EB I-690 to NB I-81 ramp and the EB I-690 to SB I-81 ramp.

6 For the eastbound I-690 to northbound I-81 ramp, the left and right shoulder widths are reversed per AASTO 10.9.6 to provide horizontal sight distance.

7 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25F - DESIGN CRITERIA, INTERSTATE DIRECT CONNECTOR RAMPS, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | Interstate Direct Connector Ramps (1) | | **Functional Classification:** | Urban Principal Arterial - Interstate |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Ramp (Direct Connection) |
| **% Trucks:** | | Varies | | **Terrain:** | Rolling |
| **ADT (2050):** | | Varies | | **Truck Access/Qualifying:** | Qualifying Highway |
| | **DESIGN ELEMENT** | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 45 mph (2) | 45 mph | 45 mph | HDM § 2.7.5.2.A |
| 2 | Travel Lane Width (Min.) | 15 ft (1 lane, R<1000 ft) (3)<br>12 ft. (1 lane, R>=1000 ft) (4) | 15 ft | 15 ft (1 lane, R<1000 ft) (3)<br>12 ft.(1 lane, R>=1000 ft)(4) | HDM § 2.7.5.2.B, Exhibit 2-9.a |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | <br>8 ft<br>3 ft | <br>3 ft*<br>2 ft* | <br>8 ft Min. & varies (5, 6)<br>3 ft. Min. & varies (5, 6) | HDM § 2.7.5.2.C<br>Exhibit 2-10, Note 2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width | <br>12 - 15 ft (3, 4)<br>8 ft Min.<br>3 ft Min | <br>15 ft.<br>3 ft.<br>2 ft. | <br>12 - 15 ft (3, 4)<br>Varies 8 - 12 ft. (5,6)<br>Varies 3 – 12 ft (5) | HDM § 2.7.5.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 5% | 3.9% | 5% | HDM § 2.7.5.2.E<br>Exhibit 2-10 |
| 6 | Horizontal Curvature (Min. Radius) | 643 ft @ 6% | 411 ft & Varies* | 1000 ft Min. | HDM § 2.7.5.2.F<br>Exhibit 2-10 |
| 7 | Superelevation (Max.) | 6% | 6.4% | 6% | HDM § 2.7.5.2.G |
| 8 | Stopping Sight Distance (Min.) | 360 ft | 180 ft & Varies* | 360 ft | HDM § 2.7.5.2.H<br>Exhibit 2-10 |
| 9 | Horizontal Clearance<br>Right<br>Left | Greater of Shoulder width or<br>6 ft (min)<br>3ft (min) | <br>3 ft (min)<br>2 ft (min) | Greater of Shoulder width or<br>6 ft (min)<br>3ft (min) | HDM § 2.7.5.2.I |
| 10 | Vertical Clearance | 14 ft Min.(7)<br>14.5 ft Desired | 14 ft | 14 ft Min. (7)<br>14.5 ft Desired | HDM § 2.7.5.2.J / NYSDOT Brg. Man. § 2.4.1<br>Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0%- | 1.5% / 2.0% | HDM § 2.7.5.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.5.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.5.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | C, may be D if heavy development necessitates | Varies | D | HDM § 2.7.5.2.N |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.5.2.O / HDM § 6.2 |
| 16 | Pedestrian Accommodation | Not Allowed | Not Allowed | Not Allowed | |
| 17 | Median Width (Min.) | N/A | N/A | N/A | |

* Nonstandard feature

Notes

1 This table applies to four connector ramps, SB I-81 to EB I-690 (Viaduct Alternative only), NB I-81 to WB I-690 and WB I-690 to NB I-81.

2 The Regional Traffic Engineer has concurred that the use of a Design Speed of 45 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

3 Lane width based on right and left shoulders are full depth, widths meet or exceed the minimum shoulder widths from Exhibit HDM 2-10 and the cross slope of traveled way and shoulders is on a single plane with no rollover.

4 Traveled way width for R≥1000 ft reduced to 12 ft, provided the combined left and right shoulder width is 4 ft or wider.

5 On inside of curves, the proposed shoulder width varies up to a maximum of 12 feet to meet HSSD criteria along the horizontal curve and to match abutting highway shoulders.

6 For two of the ramps, the left and right shoulder widths are reversed per AASTO 10.9.6 to provide horizontal sight distance.

7 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater

| TABLE 25G- DESIGN CRITERIA FOR DIAGONAL RAMPS, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | | |
|---|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes | |
| **Route No. & Name:** | | Various Interstate Diagonal Ramps (1) | | **Functional Classification:** | Urban Principal Arterial - Interstate | |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Ramp (Diagonal) | |
| **% Trucks:** | | Varies | | **Terrain:** | Rolling | |
| **ADT (2050):** | | Varies | | **Truck Access/Qualifying:** | Qualifying Highway | |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** | |
| 1 | Design Speed (Min.) | 30 mph (2) | 30 mph | 30 mph | HDM § 2.7.5.2.A | |
| 2 | Travel Lane Width (Min.) | 15 ft (1 lane R<1000 ft) (3)<br>12 ft. (1 lane, R>=1000 ft) (4) | 12 ft | 15 ft (1 lane R<1000 ft) (3)<br>12 ft.(1 lane,R>=1000ft)(4) | HDM § 2.7.5.2.B<br>Exhibit 2.9.a | |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | 6 ft<br>3 ft | 1ft & Varies* | 6 ft<br>3 ft | HDM § 2.7.5.2.C<br>Exhibit 2-10 | |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width | 12 - 15 ft (3, 4)<br>6 ft Min.<br>3 ft Min | 12 - 15 ft<br>6 ft Min.<br>3 ft Min | 12 - 15 ft (3, 4)<br>6 ft Min.<br>3 ft Min | HDM § 2.7.5.2.D<br>NYSDOT Brg. Man.§ 2.3.1 | |
| 5 | Grade (Max.) | 7% | 7% | 7% | HDM § 2.7.5.2.E<br>Exhibit 2-10 | |
| 6 | Horizontal Curvature (Min. Radius) | 231 ft @ 6% | 231 ft @ 6% | 231 ft @ 6% | HDM § 2.7.5.2.F<br>Exhibit 2-10 | |
| 7 | Superelevation (Max.) | 6% | 6% | 6% | HDM § 2.7.5.2.G | |
| 8 | Stopping Sight Distance (Min.) | 200 ft | 160 ft & Varies* | 200 ft | HDM § 2.7.5.2.H<br>Exhibit 2-10 | |
| 9 | Horizontal Clearance<br>Right<br>Left | Shoulder width or 6 ft (min)<br>3ft (min) | 6 ft (min)<br>3ft (min) | Shld width or 6 ft (min)<br>3ft (min) | HDM § 2.7.5.2.I | |
| 10 | Vertical Clearance | 14 ft Min. (5)<br>14.5 ft Desired | 14 ft Min. | 14 ft Min. (5)<br>16.5 ft Desired | HDM § 2.7.5.2.J / NYSDOT Brg. Man. § 2.4.1<br>Table 2-2 | |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.5.2.K | |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.5.2.L | |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.5.2.M<br>NYSDOT Brg. Man. § 2.6.1 | |
| 14 | Level of Service | C, may be D if heavy development necessitates | Varies | D | HDM § 2.7.5.2.N | |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.5.2.O / HDM § 6.2 | |
| 16 | Pedestrian Accommodation | At Ramp Terminal only | At Ramp Terminal | At Ramp Terminal only | PROWAG & HDM Chapter 18 | |
| 17 | Median Width (Min.) | N/A | N/A | N/A | | |

* Nonstandard feature

Note

1 Table applies to all diagonal ramps where the mainline design speed= 60 mph.

2 The Regional Traffic Engineer has concurred that the use of a Design Speed of 30 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

3 Lane width based on right and left shoulders are full depth, widths meet or exceed the minimum shoulder widths from Exhibit HDM 2-10 and the cross slope of traveled way and shoulders is on a single plane with no rollover.

4 Traveled way width for R≥1000 ft. reduced to 12 ft., provided the combined left and right shoulder width is 4 ft. or wider.

5 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25H- DESIGN CRITERIA FOR DIAGONAL RAMPS, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | Various Interstate Diagonal Ramps (1) | | **Functional Classification:** | Urban Principal Arterial - Interstate |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Ramp (Diagonal) |
| **% Trucks:** | | Varies | | **Terrain:** | Rolling |
| **ADT (2050):** | | Varies | | **Truck Access/Qualifying:** | Qualifying Highway |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 40 mph (2) | 40 mph | 40 mph | HDM § 2.7.5.2.A |
| 2 | Travel Lane Width (Min.) | 15 ft (1 lane R<1000 ft) (3)<br>12 ft. (1 lane, R>=1000 ft) (4) | 12 ft | 15 ft (1 lane R<1000 ft) (3)<br>12 ft.(1 lane,R>=1000ft)(4) | HDM § 2.7.5.2.B<br>Exhibit 2.9.a |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | 6 ft<br>3 ft | 1ft & Varies* | 6 ft<br>3 ft | HDM § 2.7.5.2.C<br>Exhibit 2-10 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width | 12 - 15 ft (3, 4)<br>6 ft Min.<br>3 ft Min | 12 - 15 ft<br>6 ft Min.<br>3 ft Min | 12 - 15 ft (3, 4)<br>6 ft Min.<br>3 ft Min | HDM § 2.7.5.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 6% | 6% | 6% | HDM § 2.7.5.2.E<br>Exhibit 2-10 |
| 6 | Horizontal Curvature (Min. Radius) | 444 ft @ 8% | 231 ft @ 6% | 444 ft @ 8% | HDM § 2.7.5.2.F<br>Exhibit 2-10 |
| 7 | Superelevation (Max.) | 8% | 8% | 8% | HDM § 2.7.5.2.G |
| 8 | Stopping Sight Distance (Min.) | 305 ft | 160 ft & Varies* | 305 ft | HDM § 2.7.5.2.H<br>Exhibit 2-10 |
| 9 | Horizontal Clearance<br>Right<br>Left | Shoulder width or 6 ft (min)<br>3ft (min) | 6 ft (min)<br>3ft (min) | Shld width or 6 ft (min)<br>3ft (min) | HDM § 2.7.5.2.I |
| 10 | Vertical Clearance | 16 ft Min. (5)<br>16.5 ft Desired | 16 ft Min. | 16 ft Min. (5)<br>16.5 ft Desired | HDM § 2.7.5.2.J /<br>NYSDOT Brg. Man. § 2.4.1<br>Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.5.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.5.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.5.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | C, may be D if heavy development necessitates | Varies | D | HDM § 2.7.5.2.N |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.5.2.O /<br>HDM § 6.2 |
| 16 | Pedestrian Accommodation | At Ramp Terminal only | At Ramp Terminal | At Ramp Terminal only | PROWAG & HDM Chapter 18 |
| 17 | Median Width (Min.) | N/A | N/A | N/A | |

* Nonstandard feature

Note

1 Table applies to all diagonal ramps where the mainline design speed= 70 mph.

2 The Regional Traffic Engineer has concurred that the use of a Design Speed of 40 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

3 Lane width based on right and left shoulders are full depth, widths meet or exceed the minimum shoulder widths from Exhibit HDM 2-10 and the cross slope of traveled way and shoulders is on a single plane with no rollover.

4 Traveled way width for R≥1000 ft reduced to 12 ft, provided the combined left and right shoulder width is 4 ft or wider.

5 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25I - DESIGN CRITERIA FOR FORMER I-81, COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | New State Route, Former I-81 south interchange to Colvin St. | | **Functional Classification:** | Urban Principal Arterial - Other Freeway/Expressway |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Other Freeways |
| **% Trucks:** | | 5% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 39,300 | | **Truck Access/Qualifying:** | Qualifying Highway |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 60 mph (1) | 60 mph | 60 mph | HDM § 2.7.1.1.A |
| 2 | Travel Lane Width (Min.) | 12 ft | 12 ft | 12 ft | HDM § 2.7.1.1.B |
| 3 | Shoulder Width (Min.)<br>Right<br>Left | <br>10 ft<br>4 ft | <br>8.3 ft*<br>4 ft | <br>10 ft<br>4 ft | HDM § 2.7.1.1.C<br>Exhibit 2-2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Shoulder Width:<br>Left Shoulder Width | <br>12 ft<br>10 ft Min.<br>4 ft Min. | <br>12 ft<br>2.3 ft Min.<br>4 ft Min. | <br>12 ft<br>10 ft Min.<br>4 ft Min. | HDM § 2.7.1.1.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 4% | 4% | 4% | HDM § 2.7.1.1.E<br>Exhibit 2-2 |
| 6 | Horizontal Curvature (Min. Radius) | 1330 ft @ 6% | 1330 ft @ 6% | 1330 ft @ 6% | HDM § 2.7.1.1.F<br>Exhibit 2-2 |
| 7 | Superelevation (Max.) | 6% | 6% | 6% | HDM § 2.7.1.1.G |
| 8 | Stopping Sight Distance (Min.) | 570 ft | 570 | 570 ft | HDM § 2.7.1.1.H<br>Exhibit 2-2 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | <br>15 ft<br>Greater of Shld. Width or 4 ft | <br>27 ft.<br>2.3 ft. | <br>15 ft<br>Greater of Shld. Width or 4 ft | HDM § 2.7.1.1.I |
| 10 | Vertical Clearance | 14 ft Min. (2, 3)<br>14.5 ft Desired | 14 ft Min. | 14 ft Min. (2, 3))<br>14.5 ft Desired | HDM § 2.7.1.1.J /<br>NYSDOT Brg. Man. § 2.4.1, Table 2-2 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.1.1.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.1.1.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.1.1.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | |
| 15 | Control of Access | Full | Full | Full | HDM § 2.7.1.1.O /<br>HDM § 6.2 |
| 16 | Pedestrian Accommodation | Not Allowed | Not Allowed | Not Allowed | |
| 17 | Median Width (Min.) | 10 ft | 10 ft | 10 ft | HDM § 2.7.1.1.P |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of XX mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 16-ft clearance exemption. New I-81 is the designated 16-ft route

3 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1ft greater

**TABLE 25J - DESIGN CRITERIA, BEAR STREET – VIADUCT and COMMUNITY GRID ALTERNATIVE**

| | | | | |
|---|---|---|---|---|
| **PIN:** | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | Bear Street (NY 298), west of Sunset Avenue | | **Functional Classification:** | Urban Principal Arterial - Other |
| **Project Type:** | Reconstruction | | **Design Classification:** | Urban Arterial |
| **% Trucks:** | 3% | | **Terrain:** | Rolling |
| **ADT (2050):** | 12,400(V) 12,100(CG) | | **Truck Access/Qualifying:** | Truck Access |

| | DESIGN ELEMENT | STANDARD CRITERIA | EXISTING CONDITION | PROPOSED CONDITION | REFERENCE |
|---|---|---|---|---|---|
| 1 | Design Speed (Min.) | 35 mph (1) | 35 mph | 35 mph | HDM § 2.7.2.2.A |
| 2 | Travel Lane Width<br>Turning Lane Width | 12 ft<br>12 ft | 12 ft<br>12 ft | 12 ft<br>12 ft | HDM § 2.7.2.2.B<br>Exhibit 2-4 |
| 3 | Shoulder Width (Min.) | 0 - 4 ft | 2 ft Curb Offset | 6 ft Shoulder | HDM § 2.7.2.2.C<br>Exhibit 2-4, Note 2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Shoulder Width: | 12 ft<br>0-4 ft Shoulder | 12 ft<br>2 ft curb offset | 12 ft<br>6 ft Shoulder | HDM § 2.7.2.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8.0% | 8.0% | 8.0% | HDM § 2.7.2.2.E<br>Exhibit 2-4 |
| 6 | Horizontal Curvature (Min. Radius) | 371 ft | 411 ft | 371 ft | HDM § 2.7.2.2.F<br>Exhibit 2-4 |
| 7 | Superelevation (Max.) | 4.0% | 4% | 4.0% | HDM § 2.7.2.2.G |
| 8 | Stopping Sight Distance (Min.) | 250 ft | 250 ft | 250 ft | HDM § 2.7.2.2.H<br>Exhibit 2-4 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | 2 ft.<br>5 ft. | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | HDM § 2.7.2.2.I |
| 10 | Vertical Clearance | 14 ft Min. (2)<br>14.5 ft Desired | 14 ft Min. | Varies 14 - 16 ft Min. (2)<br>14 - 16.5 ft Desired | HDM § 2.7.2.2.J /<br>NYSDOT Brg. Man.<br>§ 2.4.1 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | Travel Lane: 1.5% / 2.0% | Travel Lane: 2.0% | Travel Lane: 2.0% | HDM § 2.7.2.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.2.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.2.2.M<br>NYSDOT Brg. Man.<br>§ 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | N/A |
| 15 | Control of Access | N/A | Uncontrolled | N/A | |
| 16 | Pedestrian Accommodation | 5 ft (Min.) | 5 ft | 5 ft Min. (Both Sides) | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | None | N/A | |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 35 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25K - DESIGN CRITERIA, URBAN PRINCIPAL ARTERIAL OTHER, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Varies (1) |
| **Route No. & Name:** | | Almond Street, James Street, Harrison Street, East Adams St. Erie Boulevard East, West Genesee Street, West Street East Genesee St., Oswego Boulevard, Pearl St, State St. East Willow St, Crouse Ave, Irving Ave East Brighton Ave, Connector Road (former I-81 to Brighton Ave) **See Note 1, 2** | | **Functional Classification:** | Urban Principal Arterial - Other |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Urban Arterial |
| **% Trucks:** | | 3% | | **Terrain:** | Rolling |
| **ADT (2050):** | | Varies | | **Truck Access/Qualifying:** | Neither |
| | **DESIGN ELEMENT** | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 35 mph (3) | 35 mph | 35 mph | HDM § 2.7.2.2.A |
| 2 | Outside Lane Width<br>Inside Lane Width<br>Parking Lane Width | 11 ft<br>11 ft<br>8 ft | 11ft and varies | 12 ft (4)<br>11 ft (4)<br>8 ft | HDM § 2.7.2.2.B<br>Exhibit 2-4 |
| 3 | Shoulder Width (Min.) | 0-4 ft | 1 ft Curb Offset | 0 ft | HDM § 2.7.2.2.C<br>Exhibit 2-4, Note 2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Right Curb Offset:<br>Left Curb Offset | <br>11 ft<br>1 ft<br>1 ft | <br>11 ft<br>1 ft<br>1 ft | <br>11 ft<br>1 ft<br>1 ft | HDM § 2.7.2.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8.0% | 8% | 8.0% | HDM § 2.7.2.2.E<br>Exhibit 2-4 |
| 6 | Horizontal Curvature (Min. Radius) | 371 ft | 250 ft | 371 ft | HDM § 2.7.2.2.F<br>Exhibit 2-4 |
| 7 | Superelevation (Max.) | 4.0% | 4% | 4.0% | HDM § 2.7.2.2.G |
| 8 | Stopping Sight Distance (Min.) | 250 ft | 250 ft | 250 ft | HDM § 2.7.2.2.H<br>Exhibit 2-4 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | 1.0 ft<br>0 ft | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | HDM § 2.7.2.2.I |
| 10 | Vertical Clearance | Varies 14 Min. (5)<br>Varies 14.5 Desired | Varies 14 - 16 ft Min. | Varies 14-16 ft Min. (5)<br>Varies 14.5-16.5 ft (Desired) | HDM § 2.7.2.2.J /<br>NYSDOT Brg. Man. § 2.4.1 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | Travel Lane: 1.5% / 2.0%<br>Parking Lane: 1.5% / 5.0% | 2.0% | Travel Lane: 2.0%<br>Parking Lane: 2.0% | HDM § 2.7.2.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.2.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.2.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | |
| 15 | Control of Access | Uncontrolled | Uncontrolled | Uncontrolled | |
| 16 | Pedestrian Accommodation | 5 ft (Min.) | Varies | 5 ft Min. (Both Sides) | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | Varies | N/A | |

* Nonstandard feature

Notes

1 See **Table 5-1** for NHS Routes and applicable Functional Class limits and **Table 5-56** for proposed changes associated with the Community Grid Alternative.

2 Some street segment Classifications are based on anticipated changes proposed by SMTC as well as changes that would result as part of the Community Grid Alternative.

3 The Regional Traffic Engineer has concurred that the use of a Design Speed of 35 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

4 Travel and Turn Lanes adjacent to curbing to be 12 ft, Min. Travel and Turn Lanes not adjacent to curbing to be 11 ft. Min.

5 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater

| TABLE 25L - DESIGN CRITERIA, URBAN PRINCIPAL ARTERIAL RAMP, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | Yes |
| **Route No. & Name:** | | Ramp (two-way) Connection (Erie Boulevard to West Street) | | **Functional Classification:** | Urban Principal Arterial – Other |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Urban Ramp (grade separated) |
| **% Trucks:** | | 3% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 1,500 (V) 1,800(CG)- | | **Truck Access/Qualifying:** | Neither |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 20 mph (1) | 15 mph* | 20 mph | HDM § 2.7.5.2.A |
| 2 | Travel Lane Width<br>Min. for 2-way | 33 ft (2-way) | 25 ft (1 way) | 33 ft (2-way) | HDM § 2.7.5.2.B<br>Exhibit 2-9b (Case III, B) |
| 3 | Shoulder Width (Min.) | Add 2 ft | 1 ft curb offset | Add 2 ft. | HDM § 2.7.5.2.C<br>Exhibit 2-9.b, Case III |
| 4 | Bridge Roadway Width | N/A | N/A | N/A | HDM § 2.7.5.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8% | 8% | 8% | HDM § 2.7.5.2.E<br>Exhibit 2-10 |
| 6 | Horizontal Curvature<br>(Min. Radius) | 86 ft @ 4% | 55ft* | 86 ft @ 4% | HDM § 2.7.5.2.F<br>Exhibit 2-10 |
| 7 | Superelevation (Max.) | 4% | 1.5%* | 4% | HDM § 2.7.5.2.G |
| 8 | Stopping Sight Distance<br>(Min.) | 115 ft | 115 ft | 115 ft | HDM § 2.7.5.2.H<br>Exhibit 2-10 |
| 9 | Horizontal Clearance<br>Right<br>Left | Greater of Shoulder Width or<br>6 ft<br>3 ft | <br>3.5 ft w/ Barrier<br>15 ft w/o Barrier | <br>6 ft w/ Barrier<br>10 ft w/o Barrier | HDM § 2.7.5.2.I |
| 10 | Vertical Clearance | 14 ft Min.(2)<br>14.5 ft Desired | 14 ft Min. | Varies 14-16 ft Min. (2)<br>14-16.5 ft Desired | HDM § 2.7.5.2.J /<br>NYSDOT Brg. Man. § 2.4.1, Table 2-2 |
| 11 | Travel Lane Cross Slope<br>(Min.) / (Max.) | 1.5% / 2.0% | 1.5% / 2.0% | 1.5% / 2.0% | HDM § 2.7.5.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.5.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and<br>NYSDOT Design Permit Vehicle | N/A | AASHTO HL-93 and<br>NYSDOT Design Permit Vehicle | HDM § 2.7.5.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | |
| 15 | Control of Access | N/A | N/A | N/A | HDM § 2.7.5.2.O /<br>HDM § 6.2 |
| 16 | Pedestrian Accommodation | 5 ft (Min.) | Varies | 5 ft Min. (Both Sides) | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | N/A | N/A | |

* Nonstandard feature

Note

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 20 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25M - DESIGN CRITERIA, GENANT DRIVE, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | No |
| **Route No. & Name:** | | Genant Drive | | **Functional Classification:** | Urban Minor Arterial, Urban Local (1) |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Urban Arterial |
| **% Trucks:** | | 3% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 1,100(V) 600(CG) | | **Truck Access/Qualifying:** | Truck Access |
| | **DESIGN ELEMENT** | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 35 mph (2) | 35 mph | 35 mph | HDM § 2.7.2.2.A |
| 2 | Lane Width | 11 ft Min. | 12 ft | 12 ft. Min | HDM § 2.7.2.2.B Exhibit 2-4 |
| 3 | Shoulder Width (Min.) | Left: 0 Min., 1-2 ft desirable<br>Right: 0-4 ft | 1 ft curb offset | Left 0 ft<br>Right varies 0-6 ft (3) | HDM § 2.7.2.2.C Exhibit 2-4, Note 2 |
| 4 | Bridge Roadway Width | N/A | N/A | N/A | HDM § 2.7.2.2.D NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8.0% | 8.0% | 8.0% | HDM § 2.7.2.2.E Exhibit 2-4 |
| 6 | Horizontal Curvature (Min. Radius) | 371 ft | 371 ft | 371 ft | HDM § 2.7.2.2.F Exhibit 2-4 |
| 7 | Superelevation (Max.) | 4.0% | 4% | 4.0% | HDM § 2.7.2.2.G |
| 8 | Stopping Sight Distance (Min.) | 250 ft | 250 ft | 250 ft | HDM § 2.7.2.2.H Exhibit 2-4 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | 1.0 ft w/o Barrier<br>0 ft w/ Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | HDM § 2.7.2.2.I |
| 10 | Vertical Clearance | 14 ft Min. (4)<br>14.5 ft Desired | 14 ft Min. | 14 ft Min. (4)<br>14.5 ft Desired | HDM § 2.7.2.2.J / NYSDOT Brg. Man. § 2.4.1 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | Travel Lane: 1.5% / 2.0% | 2.0% | Travel Lane: 2.0% | HDM § 2.7.2.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.2.2.L |
| 13 | Structural Capacity | N/A | N/A | N/A | HDM § 2.7.2.2.M NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | |
| 15 | Control of Access | Uncontrolled | Uncontrolled | Uncontrolled | |
| 16 | Pedestrian Accommodation | 5 ft (min) | 5 ft (One side) | 5 ft (min)(One Side) | HDM § 2.7.2.2.N / HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | None | N/A | |

* Nonstandard feature

Notes

1 Functional Classification is Urban Minor Arterial between Bear St and Court Street, and Urban Local south of Court Street (See Table 5-1).

2 The Regional Traffic Engineer has concurred that the use of a Design Speed of 35 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

3 Right shoulder width = 0 feet minimum in two-way segment and 6 feet minimum in one-way segment.

4 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater

| TABLE 25N - DESIGN CRITERIA FOR COURT STREET, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | No |
| **Route No. & Name:** | | Court Street | | **Functional Classification:** | Urban Minor Arterial |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Urban Arterial |
| **% Trucks:** | | 3% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 6,700 (V) 8,000(CG) | | **Truck Access/Qualifying:** | Truck Access |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 35 mph (1) | 35 mph | 35 mph | HDM § 2.7.2.2.A |
| 2 | Travel Lane Width<br>Turning Lane Width<br>Parking Lane Width | 11 ft<br>11 ft<br>8 ft | 12 ft | 12 ft<br>12 ft<br>8 ft | HDM § 2.7.2.2.B<br>Exhibit 2-4 |
| 3 | Shoulder Width (Min.) | 0-4 ft Shoulder | 2 ft curb offset | 6 ft Shoulder | HDM § 2.7.2.2.C<br>Exhibit 2-4, Note 2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Turning Lane Width:<br>Shoulder Width: | <br>11 ft.<br>11 ft.<br>6 ft Shoulder | <br>12 ft.<br>12 ft.<br>2 ft curb offset | <br>12 ft.<br>12 ft.<br>6 ft Shoulder | HDM § 2.7.2.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8.0% | 8% | 8.0% | HDM § 2.7.2.2.E<br>Exhibit 2-4 |
| 6 | Horizontal Curvature (Min. Radius) | 371 ft | 371 ft | 371 ft | HDM § 2.7.2.2.F<br>Exhibit 2-4 |
| 7 | Superelevation (Max.) | 4.0% | 4% | 4.0% | HDM § 2.7.2.2.G |
| 8 | Stopping Sight Distance (Min.) | 250 ft | 250 ft | 250 ft | HDM § 2.7.2.2.H<br>Exhibit 2-4 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | 1.0 ft w/o Barrier<br>5 ft w/Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/Barrier | HDM § 2.7.2.2.I |
| 10 | Vertical Clearance | 14 ft Min. (2)<br>14.5 ft Desired | 14 ft Min. | 14 ft Min. (2)<br>14.5 ft Desired | HDM § 2.7.2.2.J /<br>NYSDOT Brg. Man. § 2.4.1 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | Travel Lane: 1.5% / 2.0%<br>Parking Lane: 1.5% / 5.0% | 2% | Travel Lane: 2.0%<br>Parking Lane: 2.0% | HDM § 2.7.2.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.2.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | AASHTO HL-93 and NYSDOT Design Permit Vehicle | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.2.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | |
| 15 | Control of Access | Uncontrolled | Uncontrolled | Uncontrolled | |
| 16 | Pedestrian Accommodation | 5 ft | 5 ft (Both Sides) | 5 ft (min) (Both Sides) | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | None | N/A | |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 35 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25O - DESIGN CRITERIA FOR SPENCER STREET, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | | |
|---|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | | **NHS (Y/N):** | No |
| **Route No. & Name:** | | Spencer Street | | | **Functional Classification:** | Urban Local |
| **Project Type:** | | Reconstruction | | | **Design Classification:** | Urban Local |
| **% Trucks:** | | 3% | | | **Terrain:** | Rolling |
| **ADT (2050):** | | 7,300 (V) 7,400(CG) | | | **Truck Access/Qualifying:** | Neither |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 30 mph (1) | 30 mph | | 30 mph | HDM § 2.7.2.2.A |
| 2 | Travel Lane Width<br>Turning Lane Width<br>Parking Lane Width<br>Bike Lane | 10 ft. Min, 11 ft. desirable<br>9 ft. Min, 12 ft desirable<br>8 ft.<br>6 ft. | 12 ft.<br>12 ft.<br>8 ft.<br>N/A | | 12 ft.<br>12 ft.<br>8 ft.<br>6 ft. | HDM § 2.7.2.2.B<br>Exhibit 2-4 |
| 3 | Shoulder Width (Min.) | Left: 0 Min., 1-2 ft desirable<br>Right: 0-4 ft | 2 ft curb offset | | 0 ft | HDM § 2.7.2.2.C<br>Exhibit 2-4, Note 2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Turning Lane Width:<br>Bike Lane<br>Shoulder Width | <br>12 ft.<br>12 ft.<br>6 ft.<br>0 ft. | <br>12 ft.<br>12 ft.<br>N/A<br>2 ft curb offset | | <br>12 ft.<br>12 ft.<br>6 ft.<br>0 ft. | HDM § 2.7.2.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8.0% | 8% | | 8.0% | HDM § 2.7.2.2.E<br>Exhibit 2-4 |
| 6 | Horizontal Curvature (Min. Radius) | 250 ft | 250 ft | | 250 ft | HDM § 2.7.2.2.F<br>Exhibit 2-4 |
| 7 | Superelevation (Max.) | 4.0% | 4% | | 4.0% | HDM § 2.7.2.2.G |
| 8 | Stopping Sight Distance (Min.) | 200 ft | 200 ft | | 200 ft | HDM § 2.7.2.2.H<br>Exhibit 2-4 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/Barrier | 5 ft w/Barrier<br>1.0 ft w/o Barrier | | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/Barrier | HDM § 2.7.2.2.I |
| 10 | Vertical Clearance | 14 ft Min. (2)<br>14.5 ft Desired | 14 ft Min. | | 14 ft Min. (2)<br>14.5 ft Desired | HDM § 2.7.2.2.J /<br>NYSDOT Brg. Man. § 2.4.1 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | Travel Lane: 1.5% / 2.0%<br>Parking Lane: 1.5% / 5.0% | 2% | | Travel Lane: 2.0%<br>Parking Lane: 2.0% | HDM § 2.7.2.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld. Way | <br>4% (Max.) /<br>8% (Max.) | <br>4% (Max.) /<br>8% (Max.) | | <br>4% (Max.) /<br>8% (Max.) | HDM § 2.7.2.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HDM § 2.7.2.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | | N/A | |
| 15 | Control of Access | Uncontrolled | Uncontrolled | | Uncontrolled | |
| 16 | Pedestrian Accommodation | 5 ft | 5 ft (Both Sides) | | 5 ft (min) (Both Sides) | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | None | | N/A | |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 35 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25P - DESIGN CRITERIA FOR URBAN MINOR ARTERIAL VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | No |
| **Route No. & Name:** | | MLK Jr., East<br>Renwick Avenue, Burt Street<br>Van Buren Street | | **Functional Classification:** | Urban Minor Arterial |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Urban Arterial |
| **% Trucks:** | | 3% | | **Terrain:** | Rolling |
| **ADT (2050):** | | Varies | | **Truck Access/Qualifying:** | Neither |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 35 mph (1) | 35 mph | 35 mph | HDM § 2.7.2.2.A |
| 2 | Outside Lane Width<br>Inside Lane Width<br>Parking Lane Width | 11 ft<br>11 ft<br>8 ft | Varies | 12 ft (2)<br>11 ft (2)<br>8 ft | HDM § 2.7.2.2.B<br>Exhibit 2-4 |
| 3 | Shoulder Width (Min.) | Left: 0 Min., 1-2 ft. desirable<br>Right: 0-4 ft. | 1 ft. curb offset | 0 ft | HDM § 2.7.2.2.C<br>Exhibit 2-4, Note 2 |
| 4 | Bridge Roadway Width | N/A | N/A | N/A | HDM § 2.7.2.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8.0% | 8% | 8% | HDM § 2.7.2.2.E<br>Exhibit 2-4 |
| 6 | Horizontal Curvature (Min. Radius) | 371 ft | Varies * | 371 ft | HDM § 2.7.2.2.F<br>Exhibit 2-4 |
| 7 | Superelevation (Max.) | 4.0% | 4% | 4.0% | HDM § 2.7.2.2.G |
| 8 | Stopping Sight Distance (Min.) | 250 ft | Varies* | 250 ft | HDM § 2.7.2.2.H<br>Exhibit 2-4 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | 1.0 ft w/o Barrier<br>0 ft w/ Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | HDM § 2.7.2.2.I |
| 10 | Vertical Clearance | 14 ft Min. (3)<br>14.5 ft Desired | 14 ft (Min.) | 14 ft Min.(3)<br>14.5 ft Desired | HDM § 2.7.2.2.J /<br>NYSDOT Brg. Man. § 2.4.1 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | Travel Lane: 1.5% / 2.0%<br>Parking Lane: 1.5% / 5.0% | 2.0% | Travel Lane: 2.0%<br>Parking Lane: 2.0% | HDM § 2.7.2.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.2.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and<br>NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and<br>NYSDOT Design Permit Vehicle | HDM § 2.7.2.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | |
| 15 | Control of Access | Uncontrolled | Uncontrolled | Uncontrolled | |
| 16 | Pedestrian Accommodation | 5 ft (Min.) | Varies | 5 ft (Min) | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | Varies | N/A | |

* Nonstandard feature

,Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 35 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 Travel and Turn Lanes adjacent to curbing to be 12 ft, Min. Travel and Turn Lanes not adjacent to curbing to be 11 ft. Min

3 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

| TABLE 25Q - DESIGN CRITERIA FOR BUTTERNUT STREET, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | |
|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | **NHS (Y/N):** | No |
| **Route No. & Name:** | | Butternut Street | | **Functional Classification:** | Urban Minor Arterial |
| **Project Type:** | | Reconstruction | | **Design Classification:** | Urban Arterial |
| **% Trucks:** | | 3% | | **Terrain:** | Rolling |
| **ADT (2050):** | | 4,700 (V) 6,600(CG) | | **Truck Access/Qualifying:** | Neither |
| | **DESIGN ELEMENT** | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | **REFERENCE** |
| 1 | Design Speed (Min.) | 30 mph (1) | 30 mph | 30 mph | HDM § 2.7.2.2.A |
| 2 | Travel Lane Width<br>Bike Lane Width | 11 ft.<br>6 ft. | 12 ft | 12 ft.<br>6 ft. | HDM § 2.7.2.2.B<br>Exhibit 2-4 |
| 3 | Shoulder Width (Min.) | 0-4 ft. | 2 ft curb offset | 0 ft. | HDM § 2.7.2.2.C<br>Exhibit 2-4, Note 2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Bike Lane Width:<br>Shoulder Width: | <br>12 ft.<br>6 ft.<br>0 ft. | <br>12 ft<br>N/A<br>2 ft curb offset | <br>12 ft.<br>6 ft.<br>0 ft. | HDM § 2.7.2.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 9.0 % | 9 % | 9.0 % | HDM § 2.7.2.2.E<br>Exhibit 2-4 |
| 6 | Horizontal Curvature<br>(Min. Radius) | 250 ft | 250 ft | 250 ft | HDM § 2.7.2.2.F<br>Exhibit 2-4 |
| 7 | Superelevation (Max.) | 4.0% | 4% | 4.0% | HDM § 2.7.2.2.G |
| 8 | Stopping Sight Distance<br>(Min.) | 200 ft | 200 ft | 133 ft (3) | HDM § 2.7.2.2.H<br>Exhibit 2-4 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | 1.5 ft w/o Barrier<br>0 ft w/ Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | HDM § 2.7.2.2.I |
| 10 | Vertical Clearance | 14 ft Min. (2)<br>14.5 ft Desired | 14 ft. Min. | 14 ft Min. (2)<br>14.5 ft Desired | HDM § 2.7.2.2.J /<br>NYSDOT Brg. Man. §<br>2.4.1 |
| 11 | Travel Lane Cross Slope<br>(Min.) / (Max.) | Travel Lane: 1.5% / 2.0%<br>Parking Lane: 1.5% / 5.0% | 2.0% | Travel Lane: 2.0%<br>Parking Lane: 2.0% | HDM § 2.7.2.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | HDM § 2.7.2.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and<br>NYSDOT Design Permit<br>Vehicle | AASHTO HL-93<br>and<br>NYSDOT Design<br>Permit Vehicle | AASHTO HL-93 and<br>NYSDOT Design Permit<br>Vehicle | HDM § 2.7.2.2.M<br>NYSDOT Brg. Man. §<br>2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | |
| 15 | Control of Access | Uncontrolled | Uncontrolled | Uncontrolled | |
| 16 | Pedestrian Accommodation | 5 ft (Both Sides) | 5 ft (One Side) | 5 ft (min) (Both Sides) | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | N/A | N/A | |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 30 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater.

3 Non-Standard Headlight Sight Distance at State Street intersection, see Non-Standard Feature Justification Form.

| TABLE 25R - DESIGN CRITERIA FOR URBAN LOCAL, VIADUCT and COMMUNITY GRID ALTERNATIVE | | | | | | |
|---|---|---|---|---|---|---|
| **PIN:** | | 3501.60 | | | **NHS (Y/N):** | No |
| **Route No. & Name:** | | Catherine Street, Evans Street<br>Websters Landing, Salt Street<br>North Clinton Street,<br>Fineview Place | | | **Functional Classification:** | Urban Local |
| **Project Type:** | | Reconstruction | | | **Design Classification:** | Urban Local |
| **% Trucks:** | | 3% | | | **Terrain:** | Rolling |
| **ADT (2050):** | | Varies | | | **Truck Access/Qualifying:** | Neither |
| **DESIGN ELEMENT** | | **STANDARD CRITERIA** | **EXISTING CONDITION** | **PROPOSED CONDITION** | | **REFERENCE** |
| 1 | Design Speed (Min.) | 30 mph (1) | 30 mph | 30 mph | | HDM § 2.7.4.2.A |
| 2 | Travel Lane Width<br>Turning Lane Width<br>Parking Lane Width | 10 ft. Min., 11 ft. desirable<br>9 ft. Min., 12 ft desirable<br>8 ft | Varies* | 12 ft<br>varies 11-12 ft (2)<br>8 ft | | HDM § 2.7.4.2.B<br>Exhibit 2-8 |
| 3 | Shoulder Width (Min.) | Left: 0 Min., 1-2 ft. desirable<br>Right: 0-4 ft | 1 ft curb offset | 0 ft | | HDM § 2.7.4.2.C<br>Exhibit 2-8, Note 2 |
| 4 | Bridge Roadway Width<br>Travel Lane Width:<br>Turning Lane Width:<br>Shoulder Width: | 10 ft. Min., 11 ft. desirable<br>9 ft. Min., 12 ft. desirable<br>Left: 0 Min., 1-2 ft. desirable<br>Right: 0-4 ft. | 11 ft.<br>11 ft.<br>1 ft. curb offset | 12 ft.<br>Varies 11-12 ft. (2)<br>0 ft. | | HDM § 2.7.4.2.D<br>NYSDOT Brg. Man.§ 2.3.1 |
| 5 | Grade (Max.) | 8.0% | 8% | 8.0% | | HDM § 2.7.4.2.E<br>Exhibit 2-8 |
| 6 | Horizontal Curvature (Min. Radius) | 250 ft | 250 ft | 250 ft | | HDM § 2.7.4.2.F<br>Exhibit 2-8 |
| 7 | Superelevation (Max.) | 4.0% | 4% | 4.0% | | HDM § 2.7.4.2.G |
| 8 | Stopping Sight Distance (Min.) | 200 ft | 200 ft | 200 ft | | HDM § 2.7.4.2.H<br>Exhibit 2-8 |
| 9 | Horizontal Clearance<br>Without Barrier<br>With Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | 1.0 ft w/o Barrier<br>0 ft w/ Barrier | 1.5 ft w/o Barrier<br>3 ft at Intersections<br>0 ft w/ Barrier | | HDM § 2.7.4.2.I |
| 10 | Vertical Clearance | 14 ft Min. (3)<br>14.5 ft Desired | 14 ft Min. | 14 ft Min. (3)<br>14.5 ft Desired | | HDM § 2.7.4.2.J /<br>NYSDOT Brg. Man. § 2.4.1 |
| 11 | Travel Lane Cross Slope (Min.) / (Max.) | Travel Lane: 1.5% / 2.0%<br>Parking Lane: 1.5% / 5.0% | 2.0% | Travel Lane: 2.0%<br>Parking Lane: 2.0% | | HDM § 2.7.4.2.K |
| 12 | Rollover (Max.)<br>Between Lanes /<br>At Edge of Trvld Way | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | 4% (Max.) /<br>8% (Max.) | | HDM § 2.7.4.2.L |
| 13 | Structural Capacity | AASHTO HL-93 and NYSDOT Design Permit Vehicle | HS-20 | AASHTO HL-93 and NYSDOT Design Permit Vehicle | | HDM § 2.7.4.2.M<br>NYSDOT Brg. Man. § 2.6.1 |
| 14 | Level of Service | N/A | N/A | N/A | | N/A |
| 15 | Control of Access | Uncontrolled | Uncontrolled | Uncontrolled | | |
| 16 | Pedestrian Accommodation | 5 ft (Min.) | Varies | 5 ft (min) (Min.) | | HDM § 2.7.2.2.N /<br>HDM § 18.6.5.1 |
| 17 | Median Width (Min.) | N/A | None | N/A | | |

* Nonstandard feature

Notes

1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 30 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.

2 Turn Lanes adjacent to curbing to be 12 ft, Min. and Turn Lanes not adjacent to curbing to be 11 ft. Min.

3 The minimum vertical clearance for sign structures and pedestrian bridges shall be 1-ft greater

## OTHER DESIGN PARAMETERS

In addition to the 17 critical design elements described above, other parameters established by NYSDOT and AASHTO that are typically used during the design of highway and bridge projects include the type of the design vehicle; the Level of Service (LOS) to be provided (non-interstate roadways only), which identifies the ease with which traffic can move along the roadways; the intensity of rainfall for design of storm drainage facilities; and the length of speed change lanes both during acceleration and deceleration. **Table 5-26** lists other highway design parameters used to develop the project design and **Table 5-27** lists the design vehicles used.

**Table 5-26**
**Other Design Parameters: Highway or Feature**

| | Element | Criteria | Proposed Condition |
|---|---|---|---|
| 1 | Level of Service<br>(for non-interstate highways and streets) | **D** (min.)[1]<br>**C** (desirable) | **C** (or better) |
| 2 | Drainage Design Storm | | |
| | • Interstate and Other Freeways | 10 yr. (2) | 10 yr. (2) |
| | • Principal Arterials | 10 yr. (2) | 10 yr. (2) |
| | • Local Roads and Streets | 5 yr. (3) | 5 yr. (3) |
| | • Separated Storm Trunk Line | 50 yr. (4) | 50 yr. (4) |
| | Ditch Design Storm | | |
| | • Interstate and Other Freeways | 25 yr. (5) | 25 yr. (5) |
| | • Principal Arterials | 25 yr. (5) | 25 yr. (5) |
| | • Local Roads and Streets | 10 yr. (5) | 10 yr. (5) |
| 3 | Freeboard | 2 ft. for the 50 year design flood | 2 ft. for the 50 year design flood |
| 4 | Ramp Criteria | | |
| | • Deceleration Length | Varies (6) | Greater than or equal to minimum length in AASHTO Table 10-5. |
| | • Acceleration Length | Varies (7) | Greater than or equal to minimum length in AASHTO Table 10-3. |
| | • Ramp Spacing (8) | | |
| | ▪ EN to EN or EX to EX | 1000 ft. | Greater than or equal to 1000 ft. |
| | ▪ EN to EX (System to Service) | 2000 ft. | Greater than or equal to 2000 ft. |
| | ▪ EN to EX (Service to Service) | 1600 ft. | Greater than or equal to 1600 ft. |

**Notes:**

1. In heavily developed sections of metropolitan areas, conditions may necessitate a minimum LOS of D.
2. A 50-year frequency shall be used for design at the following locations where no overflow relief is available:
   a. A sag vertical curves connecting negative and positive grades.
   b. Other locations such as underpasses, depressed roadways, etc.
3. A 25-year frequency shall be used for design at the following locations where no overflow relief is available:
   a. A sag vertical curves connecting negative and positive grades.
   b. Other locations such as underpasses, depressed roadways, etc.
4. Tentative – DOT reviewing criteria.
5. Including lining material.
6. Refer to AASHTO Policy on Geometric Design of Highways & Streets, Table 10-5.
7. Refer to AASHTO Policy on Geometric Design of Highways & Streets, Table 10-3.
8. Refer to AASHTO Policy on Geometric Design of Highways & Streets, Figure 10-68. EN = Entrance Ramp, EX = Exit Ramp

**Table 5-27**
**Other Design Parameter: Design Vehicle**

| Location | Design Vehicle | Vehicle Accommodated |
|---|---|---|
| I-81, including ramps | WB-67 | WB-67 |
| I-690, including ramps | WB-67 | WB-67 |
| I-481, including ramps | WB-67 | WB-67 |
| Almond Street, Erie Blvd, Irving Avenue, Van Buren Street, Adams Street, Harrison Street (3) | S-BUS-40 | S-BUS-40 (1) |
| Burt Street, Taylor Street, Jackson Street, Monroe Street, Madison Street, Cedar Street, Water Street, East Castle Street, Crouse Avenue, McBride Street, Townsend Street, State Street, Pearl Street, Warren Street, James Street, Willow Street, Butternut Street, Genant Drive, Franklin Street, Clinton Street, Evans Street, Park Street, West Street (3) | SU-30 | SU-30 (2) |

**Notes:**

1. An S-BUS-40 design vehicle was used along the portion of the roadway designated as a city bus route and a SU-30 design vehicle was used elsewhere along the corridor.
2. Where necessary minor encroachment into the adjacent (same direction) lane to accommodate the design vehicle was allowed to facilitate movement.
3. Design Vehicle criteria applies to the portions of the roadway corridor that is slated to be reconstructed.

**Table 5-28** lists the primary design values for a paved shared-use path, and **Table 5-29** lists the primary design values for raised cycle tracks.

**Table 5-28**
**Primary Design Values for Paved Shared-Use Path**

| Element | Standard Value | Source (1) | Proposed Value |
|---|---|---|---|
| Design Speed | 20 mph | AASHTO | 20 mph |
| Shared-Use Width | 10 ft min. | AASHTO | 14 ft min. (2) |
| Adjacent Graded Width | 2 ft min. | AASHTO | 2 ft min. |
| Adjacent Graded Slope | 1:6 max. cross slope | AASHTO | 1:6 max. cross slope |
| Maximum Grade | 5% max. or match grade of adjacent roadway | AASHTO | 5% max. or match grade of adjacent roadway |
| Cross Slope | 2% max. | HDM Chapter 18 | 2% max. |
| Horizontal Curvature | 74 ft min. | AASHTO | 74 ft min. |
| Stopping Sight Distance | 195 ft min. | AASHTO | 195 ft min. (3) |
| Horizontal Sight Distance | 56 ft min. | AASHTO | 56 ft min. (3) |
| Crest Vertical Curve | 423 ft min. | AASHTO | 423 ft min. (3) |
| Horizontal Clearance | 2 ft min. | AASHTO | 2 ft min. |
| Vertical Clearance | 10 ft min. | AASHTO | 10 ft min. |

Notes

1) 2012 AASHTO Guide for the Development of Bicycle Facilities.
2) Typical Width except for the following locations with 12 ft. minimum width:
   a. Viaduct Alternative: along Almond Street between Jackson and Adams Street.
   b. Community Grid Alternative: between Van Buren Street and Raynor Avenue on east side of Almond Street.
   c. Community Grid Alternative: between Erie Boulevard and Water Street.
   d. Both Alternatives where connecting to Onondaga Creekwalk.
   e. Except at switch-back condition at Evans Street on the west side of Onondaga Creek.

**Table 5-29**
**Primary Design Values for Raised Cycle Tracks**

| Element | Standard Value | Source (1) | Proposed Value |
|---|---|---|---|
| One Way Width | 6.5 ft. min. | NACTO | 7 ft. min. |
| Two Way Width | 12 ft min. | NACTO | 12 ft min. |
| Vertical Separation from Roadway | 1 inch min.<br>6 inches max. | NACTO | 6 inches |
| Vertical Separation from Sidewalk | 1 inch min.<br>6 inches max. | NACTO | 0 inches |
| Maximum Grade | 5% max. or match grade of adjacent roadway | | 5% max. or match grade of adjacent roadway |
| Cross Slope | 2% max. | NACTO | 2% max. |
| Buffer to parallel parking lane | 3 ft min. | NACTO | 6 ft min. (2) |
| Buffer to drive lane with fixed objects | 3 ft min. | NACTO | 14 ft min. (3) |

**Notes:**

1) NACTO Urban Bikeway Design Guide, second edition.
2) Except on Salina Street where 4.5 ft. minimum should be used.
3) Except at the following locations:
   a) Community Grid Alternative: 6 ft minimum on Almond Street where cycle track passes below new railroad bridge.
   b) Community Grid Alterative: 4 ft minimum on east side of Almond Street approaching Genesee St adjacent to right turn vehicular lane.
   c) Community Grid Alternative: 6.5 ft at the north end of Almond Street to transition to bike lanes between Erie Boulevard and Burnet Avenue.
   d) Community Grid Alternative: 6.5 ft at State Street cycle track.
   e) Community Grid Alternative: 7.5 at Harrison Street cycle track to transition to bike lanes.
   f) Community Grid Alternative: 10 ft on MLK Jr., East cycle track to transition to bike lane

**Table 5-30** lists other design parameters for railroad related elements of work.

**Table 5-30**
**Other Design Parameters: Railroad Facilities**

| | Element | Criteria | Proposed Condition |
|---|---|---|---|
| CSX Railroad | Horizontal Clearance: | | |
| | With off-track roadway | 28 ft (20 ft. with crash wall) | 28 ft (20 ft. with crash wall) |
| | Without off-track roadway | 20 ft (12 ft. with crash wall) | 20 ft (12 ft. with crash wall) |
| | Vertical Clearance | 22 ft. min from top of rail | 22 ft. min from top of rail |
| NYS&W Railway | Design Speed: | | |
| | Permanent Condition | 30 mph | 30 mph |
| | Temporary Condition | 10 mph | 10 mph |
| | Horizontal Curvature (Min.) | 4.5 degrees (1) | 4.5 degrees (1) |
| | Track Grade (Max.) | 1.05% | 1.05% |
| | Bridge Design Loading: | Cooper E80 | Cooper E80 |
| | Horizontal Clearance (Min.) | | |
| | On Bridge: | 15 ft. from track centerline | 15 ft. from track centerline |
| | Off Bridge: | 18 ft. from track centerline, 12 ft with crash wall. | 18 ft. from track centerline, 12 ft with crash wall. |
| | Vertical Clearance | 22 ft. min. from top of rail | 22 ft. min. from top of rail |

**Notes:**
1. Based on 1-1/2 inch unbalanced superelevation (Eu) and 1-1/4 inch superelevation (Ea.).

## 5.5 ENGINEERING CONSIDERATIONS OF THE VIADUCT ALTERNATIVE

## OPERATIONS (TRAFFIC AND SAFETY) AND MAINTENANCE

### Functional Classification and National Highway System

The Functional Classifications and NHS designations would not change under the Viaduct Alternative.

### Control of Access

Access to the all sections of interstate within the Project Area would remain fully controlled. Access to the various city and local streets within the Project Area would remain generally uncontrolled, but some amount of access control would be provided near ramp termini as described in **Table 5-31**.

### Traffic Control Devices

*Traffic Signals*

Under the Viaduct Alternative, the traffic signal that currently exists at the intersection of Townsend Street and the westbound I-690 off-ramp would be removed, as the westbound I-690 off-ramp would be relocated to Catherine Street. Multiple intersections would need to be created or reconstructed to accommodate new approaches and lane configurations. To safely accommodate vehicle and pedestrian movements under the Viaduct Alternative, it would be necessary to install new traffic signals or replace existing traffic signal equipment to conform to modified geometrics and phasing where appropriate.

Due to modifications to the city streets and interstate on- and off-ramps, new signalized intersections would be created under the Viaduct Alternative as follow:

- Almond Street at Van Buren Street
- Catherine Street at the eastbound I-690 On-ramp
- Catherine Street at the westbound I-690 Off-Ramp
- MLK Jr., East at the northbound I-81 Off-Ramp
- MLK Jr., East at Southbound I-81 On-Ramp
- I-81 South Off-Ramp/Genant Drive at Spencer Street
- North West Street at NY 5/West Genesee Street
- Intersections that would receive traffic signal replacements under the Viaduct Alternative are listed below:
- Almond Street at E. Adams Street
- Almond Street at E. Fayette Street
- Almond Street at E. Washington Street
- Almond Street at E. Water Street
- Almond Street at Harrison Street
- Almond Street at the southbound I-81 Off-Ramp

- Almond Street at NY 92/East Genesee Street
- Almond Street/Catherine Street at NY 5/Erie Boulevard East
- Catherine Street at Burnet Avenue
- I-81 South On-Ramp/Genant Drive at Bear Street
- North Clinton Street at NY 5/West Genesee Street
- North Franklin Street at NY 5/West Genesee Street
- North Franklin Street/Butternut Street/Websters Landing (future North Franklin/Websters Landing).
- North State Street at Butternut Street
- South Crouse Avenue at East Adams Street
- South Crouse Avenue at Harrison Street
- South Crouse Avenue at NY 92/East Genesee Street

Coordination between newly installed or replaced traffic signals would be through the existing centrally controlled traffic signal communication system. Inductance loops disturbed by the Project would be replaced in kind. Pedestrian signals and push buttons would be included as part of the new signal system and pedestrian countdown timers would be provided at redesigned intersections where appropriate.

*Signs*

New signs would be added where required and existing signs replaced as needed with new signs meeting current Manual on Uniform Traffic Control Devices (MUTCD) standards. Signage would be installed to ensure motorists situate their vehicles in the appropriate lanes to complete desired maneuvers and to promote wayfinding to relocated interstate access points. Signs would be installed on standard posts needed to handle the necessary loading.

*Pavement Markings*

New pavement markings would be installed within the project limits in accordance with MUTCD standards. Crosswalks would be installed at all crossing locations. Stop bars would be placed at all approaches to signalized intersections and all stop-controlled approaches at unsignalized intersections. Lane striping and arrow markings would be provided to delineate the through and auxiliary turn lanes required to meet traffic operational requirements.

### Intelligent Transportation Systems (ITS)

The Regional Architecture used to plan and develop the current NYSDOT Region 3 ITS system was published in August 2002 and was based on the National ITS Architecture current at that time. The National ITS Architecture has been updated as Ver. 5 in 2003, Ver. 6 in 2007, and Ver. 7 in 2012 with additional updates in Ver. 7.1 published in 2015.

**Table 5-31**
**Control of Access – Viaduct Alternative**

| Intersecting Feature | Type of Access | Address/Street | Existing Distance | Standard Distance | Proposed Distance | Action[1] |
|---|---|---|---|---|---|---|
| Southbound I-81 Entrance | Private Driveway | 408 MLK. Jr., East | N/A | 100 | 20 | Close |
| Southbound I-81 Entrance | Private Driveway | 416 Raynor Ave | N/A | 100 | 0 | Close [2] |
| Northbound I-81 Entrance from Pearl St. | Private Driveway | 400 Pearl Street | 20 | 50 | 20 | Maintain[3] |
| Northbound I-81 Exit at Adams St. | Public Street | Almond Street | 20 | 50 | 20 | Maintain[4] |
| Eastbound I-690 Entrance from Catherine St. | Public Street | Erie Blvd. East | N/A | 100 | 40 | Maintain[5] |
| Eastbound I-690 Entrance | Private Driveway | 701 Erie Blvd. East | N/A | 100 | 0 | Close |
| Westbound I-690 Exit to Catherine St. | Public Street | Burnet Ave | N/A | 100 | 40 | Maintain[6] |
| Westbound I-690 Exit to Catherine St. | Private Driveway | 320 Burnet Ave | N/A | 100 | 0 | Close |
| Northbound I-81 Entrance from Pearl St. | Driveway to State owned parking lot | Pearl Street | 0 | 100 | 130 | Relocate[7] |
| Butternut Street | Private Driveway | 215 Genant Dr. | N/A | N/A | N/A | Close[8] |
| Mainline I-81 | Private Driveway | 311 Genant Dr. | N/A | N/A | N/A | Close[9] |
| Mainline I-81 | Private Driveway | 431 Genant Dr. | N/A | N/A | N/A | Close[10] |
| Mainline I-81 | Private Driveway | 706-16 Clinton St | N/A | N/A | N/A | Close[11] |
| Northbound I-81 Entrance from Sunset Ave. | Private Driveway | 147 Court Street to 310 Sunset Ave | 0 | 100 | 0 | Maintain[12] |
| Northbound I-81 Exit to Sunset Ave. | Private Driveway | 220 Sunset Ave to 201 Danforth Ave | 0 | 100 | 0 | Maintain[13] |
| Southbound I-81 Entrance from Bear/Genant St. | Public Street | Bear Street | 80 | 100 | 0 | Maintain[14] |
| Southbound I-81 Exit to Spencer St. | Private Driveway | 800 Clinton St | N/A | 100 | 90 | Maintain[15] |

**Notes:**

1. Refer to Non-Standard Feature Justification Forms in Appendix A-3 for all non-standard Control of Access locations recommended to be maintained.
2. driveway providing access To/From Martin Luther King Jr., East From /To a parking lot for Dr. King Elementary School
3. The driveway for an existing business is on the opposite side of Pearl St., across from the northbound entrance ramps
4. Northbound Almond Street joins northbound I-81 exiting traffic on the south side of the Adams St. /Almond St. Intersection.
5. The proposed eastbound I-690 entrance ramp from Catherine St. is just north of the Catherine St. /Erie Blvd. intersection
6. The proposed westbound I-690 exit to Catherine St. is just south of the Catherine St. /Burnet Ave. intersection.
7. Parking Lot driveway owned by State of NY, will be relocated further north, opposite E. Belden Ave.
8. New retaining wall blocking driveway.
9. Two driveways to be closed and relocated to Clinton Street, due to the removal of Genant Drive.
10. Four driveways to be closed and relocated to Clinton Street, due to the removal of Genant Drive, including access to the electrical substation.
11. Two driveways to be closed and relocated to Clinton Street, due to the removal of Genant Drive.
12. Four Driveways on the east side of Sunset Avenue (opposite from the ramp terminal), belonging to multiple residences.
13. Seven Driveways on the east side of Sunset Avenue (opposite from the ramp terminal), belonging to multiple residences.
14. Entrance ramp to southbound I-81 splits from Genant Dr. just south of the Genant Dr. /Bear St. intersection.
15. Private driveway on north side of Spencer St. just west of the new southbound I-81 exit to Spencer St.

Changes to the National Architecture over this time have included new service packages for Security, maintenance services for infrastructure monitoring and Advanced Traffic Management services including roadside lighting control systems, variable speed limits, dynamic lane management and shoulder use, and dynamic roadway warning. Version 7.1 has also updated recommendations and terminology for connected vehicle services.

Under any build alternative, the Region 3 published vision represented by the Regional Architecture should be updated from the 2002 version to align with the current technologies for security, detection, communication, and data archiving that have emerged and matured since this Architecture was developed.

The existing ITS system would be minimally affected by the Viaduct Alternative. CCTV and sensors are currently mounted on poles up to 100 feet in height with integrated lowering systems and wireless communications. VMS signs are roadside shoulder mounted with wireless communications. There are no devices mounted to the viaduct. Six camera locations and three VMS locations would need to be removed and replaced to the new shoulder as the roadway is widened. New equipment may include additional cameras, signs or sensors to supplement and improve the existing system and should follow a similar placement strategy to remain clear of the viaduct. This would ease construction of the viaduct modifications and limit operational and maintenance issues created by mounting vibration sensitive electronic devices on the elevated structures.

Similarly, any new technology included in market packages identified during a Regional Architecture update, such as Bluetooth sensors for travel time calculation, wrong way detection systems including sensors, flashers and signs, should be placed outside of the viaduct envelope to the greatest extent possible, on shoulders and supported by lowering devices.

Existing equipment should be adjusted and supplemented prior to construction to provide ITS benefits to the work zone. Additional Smart Work Zone equipment, operated and maintained by the Contractor with access provided for NYSDOT and stakeholder agencies, should also be implemented during construction wherever the roadway is left open to traffic to ensure incidents are minimized and addressed as quickly as possible.

### Speeds and Delay

*Speed and Travel Time Estimates*

Travel time and travel speed projections for the 2020 and 2050 Viaduct Alternative conditions were performed using the VISSIM models developed for the Project. **Tables 5-32** and **5-33** present the estimated travel times, speed and delay for each of 11 travel routes by direction during the AM and PM peak hours. 2020 and 2050 freeway speeds throughout the project area for the AM peak hour would range from 53 to 63 mph and from 44 to 63 mph, respectively. For the PM peak hour, 2020 and 2050 freeway speeds would range from 53 to 63 mph and from 50 to 63 mph, respectively. 2020 and 2050 Viaduct Alternative travel speeds on most freeway routes would be similar to and slightly higher than the corresponding No Build travel speeds.

Arterial travel speeds throughout the project area during the AM peak hour would range from 10 to 18 mph and from 8 to 16 mph in 2020 and 2050, respectively. During the PM peak hour, 2020 and 2050 arterial travel speeds would range from 8 to 20 mph and from 7 to 18 mph, respectively. 2050 arterial travel speeds would be slightly lower than their corresponding 2020 arterial speeds. Similar to the existing and No Build conditions, a vast majority of arterial routes under the 2020 and 2050 Viaduct traffic conditions could be characterized as low-speed routes because their travel speeds are less than 20 mph during one or more peak hours.

Travel times for key origin-destination pairs in Onondaga County were estimated using output from VISSIM traffic simulations as well as the SMTC Regional Travel Demand Model. **Table 5-34** summarizes the average travel times for trips traveling between these origin-destination pairs during the AM and PM peak periods.

**Table 5-32**
**2020 No Build and Viaduct Alternative Travel Time Delay and Speeds**

| ID | Route | Direction | Travel Time (min) | | | | Travel Delay (min) | | | | Travel Speed (mph) | | | | Speed Limit | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NB | | Viaduct | | NB | | Viaduct | | NB | | Viaduct | | NB | Viaduct |
| | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | (mph) | (mph) |
| 1 | I-81 from Exit 17 to Exit 29N | NB | 13 | 14 | 12 | 13 | 2 | 3 | 2 | 2 | 55 | 53 | 58 | 56 | 55-65 | 55-65 |
| | | SB | 15 | 13 | 13 | 13 | 5 | 3 | 3 | 2 | 46 | 53 | 53 | 55 | 55-65 | 55-65 |
| 2 | I-481 from Exit 2 to Exit 8 | NB | 13 | 13 | 13 | 13 | 1 | 1 | 1 | 1 | 63 | 63 | 63 | 63 | 65 | 65 |
| | | SB | 13 | 13 | 13 | 13 | 1 | 1 | 1 | 1 | 63 | 63 | 63 | 63 | 65 | 65 |
| 3 | I-690 from Exit 8 to Exit 17 | EB | 9 | 9 | 9 | 9 | 1 | 1 | 1 | 1 | 52 | 52 | 55 | 56 | 55 | 55 |
| | | WB | 9 | 10 | 9 | 9 | 1 | 2 | 1 | 1 | 53 | 49 | 55 | 53 | 55 | 55 |
| 4 | Irving Avenue from Raynor Avenue to Fayette Street | NB | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 11 | 12 | 14 | 13 | 30 | 30 |
| | | SB | 4 | 6 | 4 | 5 | 3 | 5 | 3 | 3 | 12 | 8 | 13 | 11 | 30 | 30 |
| 5 | Almond Street from Van Buren Street to Burnet Avenue | NB | 5 | 5 | 6 | 8 | 4 | 4 | 4 | 6 | 11 | 11 | 10 | 8 | 30 | 30 |
| | | SB | 7 | 6 | 5 | 6 | 6 | 4 | 4 | 4 | 9 | 11 | 12 | 12 | 30 | 30 |
| 6 | State Street from Adams Street to Butternut Street | NB | 5 | 8 | 5 | 7 | 3 | 6 | 3 | 5 | 12 | 8 | 13 | 10 | 30 | 30 |
| 7 | Clinton Street from Websters Landing to Adams Street | SB | 3 | 5 | 4 | 5 | 2 | 3 | 3 | 4 | 15 | 10 | 12 | 10 | 30 | 30 |
| 8 | West Street from Adams Street to Genesee Street | NB | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 2 | 20 | 20 | 18 | 14 | 35 | 35 |
| | | SB | 2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 21 | 16 | 18 | 20 | 35 | 35 |
| 9 | Fayette Street from Walnut Avenue to West Street | EB | 6 | 6 | 6 | 7 | 3 | 4 | 3 | 5 | 14 | 12 | 14 | 11 | 30 | 30 |
| | | WB | 8 | 7 | 6 | 7 | 6 | 4 | 4 | 5 | 10 | 11 | 13 | 11 | 30 | 30 |
| 10 | Harrison Street from Comstock Avenue to West Street | WB | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 5 | 12 | 12 | 12 | 12 | 30 | 30 |
| 11 | Adams Street from West Street to Comstock Avenue | EB | 8 | 8 | 8 | 9 | 6 | 6 | 6 | 6 | 11 | 11 | 11 | 10 | 30 | 30 |

**Table 5-33**
**2050 No Build and Viaduct Alternative Travel Time Delay and Speeds**

| ID | Route | Direction | Travel Time (min) | | | | Travel Delay (min) | | | | Travel Speed (mph) | | | | Speed Limit | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NB | | Viaduct | | NB | | Viaduct | | NB | | Viaduct | | NB | Viaduct |
| | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | (mph) | (mph) |
| 1 | I-81 from Exit 17 to Exit 29N | NB | 13 | 14 | 13 | 13 | 2 | 3 | 3 | 2 | 54 | 53 | 54 | 55 | 55-65 | 55-65 |
| | | SB | 18 | 13 | 13 | 13 | 8 | 3 | 3 | 2 | 38 | 52 | 52 | 55 | 55-65 | 55-65 |
| 2 | I-481 from Exit 2 to Exit 8 | NB | 13 | 13 | 13 | 13 | 1 | 1 | 1 | 1 | 63 | 63 | 63 | 62 | 65 | 65 |
| | | SB | 13 | 13 | 13 | 13 | 1 | 2 | 1 | 1 | 63 | 63 | 63 | 63 | 65 | 65 |
| 3 | I-690 from Exit 8 to Exit 17 | EB | 9 | 9 | 11 | 9 | 1 | 1 | 3 | 1 | 51 | 53 | 44 | 55 | 55 | 55 |
| | | WB | 9 | 10 | 9 | 10 | 1 | 2 | 1 | 2 | 54 | 50 | 54 | 50 | 55 | 55 |
| 4 | Irving Avenue from Raynor Avenue to Fayette Street | NB | 5 | 4 | 4 | 4 | 3 | 2 | 3 | 3 | 10 | 13 | 12 | 12 | 30 | 30 |
| | | SB | 4 | 5 | 4 | 6 | 3 | 3 | 3 | 4 | 12 | 11 | 11 | 9 | 30 | 30 |
| 5 | Almond Street from Van Buren Street to Burnet Avenue | NB | 4 | 5 | 7 | 9 | 2 | 3 | 5 | 7 | 15 | 12 | 8 | 7 | 30 | 30 |
| | | SB | 11 | 6 | 7 | 7 | 9 | 5 | 5 | 5 | 6 | 11 | 10 | 10 | 30 | 30 |
| 6 | State Street from Adams Street to Butternut Street | NB | 6 | 7 | 5 | 7 | 4 | 5 | 4 | 5 | 12 | 10 | 12 | 9 | 30 | 30 |
| 7 | Clinton Street from Websters Landing to Adams Street | SB | 3 | 4 | 4 | 4 | 2 | 2 | 2 | 3 | 14 | 13 | 13 | 12 | 30 | 30 |
| 8 | West Street from Adams Street to Genesee Street | NB | 2 | 3 | 3 | 4 | 1 | 2 | 2 | 2 | 21 | 17 | 16 | 13 | 35 | 35 |
| | | SB | 3 | 4 | 3 | 2 | 2 | 3 | 2 | 1 | 15 | 12 | 16 | 18 | 35 | 35 |
| 9 | Fayette Street from Walnut Avenue to West Street | EB | 6 | 6 | 6 | 7 | 4 | 4 | 4 | 5 | 13 | 12 | 13 | 10 | 30 | 30 |
| | | WB | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 5 | 10 | 11 | 11 | 11 | 30 | 30 |
| 10 | Harrison Street from Comstock Avenue to West Street | WB | 7 | 9 | 6 | 7 | 5 | 6 | 3 | 4 | 12 | 10 | 15 | 12 | 30 | 30 |
| 11 | Adams Street from West Street to Comstock Avenue | EB | 8 | 8 | 8 | 7 | 5 | 5 | 5 | 5 | 11 | 12 | 11 | 12 | 30 | 30 |

**Table 5-34**
**No Build and Viaduct Alternative Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak | | AM | | PM | | AM | | PM | |
| Origin | Destination | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct |
| Baldwinsville | Cicero | 22 | 22 | 23 | 23 | 23 | 23 | 23 | 23 |
| | Destiny USA | 23 | 24 | 20 | 21 | 23 | 25 | 21 | 22 |
| | Downtown | 22 | 22 | 21 | 21 | 22 | 24 | 21 | 21 |
| | Fairmount | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| | Fayetteville/Manlius | 31 | 30 | 31 | 30 | 31 | 33 | 31 | 31 |
| | LaFayette | 33 | 31 | 31 | 31 | 33 | 34 | 32 | 32 |
| | Liverpool | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 |
| | St. Joseph's Hospital | 24 | 22 | 21 | 21 | 23 | 24 | 21 | 21 |
| | University Hill | 26 | 25 | 25 | 22 | 26 | 26 | 23 | 23 |
| Cicero | Baldwinsville | 21 | 21 | 23 | 23 | 21 | 21 | 23 | 23 |
| | Destiny USA | 13 | 11 | 11 | 11 | 13 | 11 | 11 | 11 |
| | Downtown | 17 | 14 | 14 | 14 | 17 | 13 | 16 | 13 |
| | Fairmount | 23 | 21 | 22 | 22 | 23 | 20 | 23 | 21 |
| | Fayetteville/Manlius | 19 | 19 | 19 | 19 | 18 | 18 | 19 | 19 |
| | LaFayette | 28 | 25 | 25 | 25 | 28 | 23 | 27 | 24 |
| | Liverpool | 13 | 13 | 14 | 14 | 13 | 13 | 13 | 13 |
| | St. Joseph's Hospital | 17 | 14 | 13 | 13 | 17 | 12 | 16 | 13 |
| | University Hill | 21 | 18 | 18 | 16 | 21 | 16 | 19 | 15 |
| Destiny USA | Baldwinsville | 22 | 22 | 25 | 24 | 22 | 23 | 26 | 26 |
| | Cicero | 11 | 11 | 13 | 12 | 10 | 10 | 11 | 11 |
| | Downtown | 8 | 8 | 9 | 9 | 8 | 7 | 10 | 8 |
| | Fairmount | 11 | 11 | 14 | 13 | 11 | 11 | 15 | 14 |
| | Fayetteville/Manlius | 18 | 17 | 19 | 19 | 17 | 17 | 21 | 19 |
| | LaFayette | 21 | 19 | 20 | 20 | 19 | 18 | 21 | 20 |
| | Liverpool | 8 | 9 | 10 | 10 | 8 | 9 | 9 | 10 |
| | St. Joseph's Hospital | 7 | 7 | 8 | 8 | 7 | 7 | 8 | 8 |
| | University Hill | 13 | 12 | 13 | 11 | 12 | 10 | 13 | 11 |
| Downtown | Baldwinsville | 20 | 21 | 21 | 22 | 19 | 21 | 21 | 24 |
| | Cicero | 16 | 14 | 15 | 15 | 13 | 14 | 14 | 14 |
| | Destiny USA | 6 | 5 | 6 | 6 | 5 | 5 | 5 | 6 |
| | Fairmount | 13 | 14 | 14 | 15 | 12 | 14 | 13 | 16 |
| | Fayetteville/Manlius | 16 | 15 | 17 | 17 | 15 | 15 | 16 | 17 |
| | LaFayette | 17 | 16 | 18 | 17 | 17 | 16 | 17 | 18 |
| | Liverpool | 10 | 9 | 10 | 10 | 8 | 9 | 9 | 10 |
| | St. Joseph's Hospital | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

**Table 5-34**
**No Build and Viaduct Alternative Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak | | AM | | PM | | AM | | PM | |
| Origin | Destination | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct |
| | University Hill | 7 | 7 | 8 | 7 | 7 | 6 | 7 | 7 |
| Fairmount | Baldwinsville | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 |
| | Cicero | 22 | 22 | 23 | 22 | 22 | 21 | 22 | 21 |
| | Destiny USA | 13 | 12 | 13 | 12 | 13 | 13 | 13 | 12 |
| | Downtown | 13 | 14 | 13 | 12 | 13 | 16 | 13 | 13 |
| | Fayetteville/Manlius | 23 | 22 | 23 | 23 | 23 | 24 | 23 | 23 |
| | LaFayette | 23 | 23 | 23 | 23 | 25 | 25 | 24 | 24 |
| | Liverpool | 17 | 17 | 17 | 16 | 17 | 18 | 18 | 17 |
| | St. Joseph's Hospital | 16 | 14 | 13 | 13 | 14 | 16 | 13 | 13 |
| | University Hill | 17 | 17 | 16 | 14 | 17 | 18 | 15 | 15 |
| Fayetteville/ Manlius | Cicero | 28 | 27 | 29 | 29 | 28 | 28 | 30 | 30 |
| | Destiny USA | 17 | 17 | 17 | 17 | 16 | 16 | 17 | 17 |
| | Downtown | 13 | 13 | 14 | 13 | 13 | 13 | 14 | 13 |
| | Fairmount | 15 | 14 | 14 | 15 | 14 | 14 | 14 | 15 |
| | Fayetteville/Manlius | 21 | 20 | 22 | 22 | 20 | 20 | 22 | 22 |
| | LaFayette | 18 | 18 | 19 | 18 | 18 | 18 | 19 | 19 |
| | Liverpool | 17 | 17 | 18 | 17 | 17 | 17 | 18 | 18 |
| | St. Joseph's Hospital | 13 | 13 | 13 | 14 | 13 | 13 | 13 | 14 |
| | University Hill | 16 | 15 | 16 | 16 | 16 | 16 | 15 | 16 |
| LaFayette | Baldwinsville | 30 | 30 | 31 | 30 | 31 | 30 | 32 | 32 |
| | Destiny USA | 25 | 24 | 25 | 25 | 25 | 24 | 24 | 24 |
| | Downtown | 15 | 15 | 15 | 15 | 16 | 15 | 16 | 15 |
| | Fairmount | 16 | 17 | 16 | 16 | 17 | 17 | 16 | 16 |
| | Fayetteville/Manlius | 23 | 23 | 24 | 23 | 23 | 23 | 24 | 24 |
| | LaFayette | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| | Liverpool | 19 | 19 | 20 | 19 | 20 | 20 | 20 | 20 |
| | St. Joseph's Hospital | 17 | 17 | 18 | 18 | 19 | 18 | 16 | 18 |
| | University Hill | 15 | 14 | 15 | 14 | 17 | 15 | 15 | 14 |
| Liverpool | Baldwinsville | 13 | 13 | 15 | 15 | 14 | 14 | 14 | 14 |
| | Cicero | 14 | 14 | 15 | 15 | 13 | 13 | 14 | 14 |
| | Downtown | 7 | 7 | 6 | 8 | 6 | 8 | 7 | 8 |
| | Fairmount | 11 | 9 | 9 | 9 | 10 | 8 | 12 | 9 |
| | Fayetteville/Manlius | 16 | 16 | 17 | 17 | 16 | 15 | 19 | 17 |
| | LaFayette | 21 | 19 | 20 | 19 | 20 | 18 | 22 | 19 |
| | Liverpool | 24 | 20 | 20 | 20 | 22 | 19 | 23 | 20 |

**Table 5-34**
**No Build and Viaduct Alternative Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak | | AM | | PM | | AM | | PM | |
| Origin | Destination | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct |
| | St. Joseph's Hospital | 11 | 9 | 8 | 8 | 10 | 8 | 11 | 8 |
| | University Hill | 17 | 12 | 13 | 11 | 14 | 12 | 15 | 11 |
| St. Joseph's Hospital | Baldwinsville | 21 | 20 | 21 | 22 | 20 | 20 | 23 | 23 |
| | Cicero | 13 | 12 | 13 | 13 | 12 | 12 | 12 | 12 |
| | Destiny USA | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 |
| | Fairmount | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| | Fayetteville/Manlius | 14 | 13 | 14 | 15 | 13 | 13 | 15 | 15 |
| | LaFayette | 14 | 14 | 16 | 16 | 14 | 14 | 15 | 16 |
| | Liverpool | 18 | 18 | 18 | 19 | 18 | 17 | 18 | 19 |
| | St. Joseph's Hospital | 7 | 7 | 8 | 8 | 7 | 7 | 8 | 8 |
| | University Hill | 7 | 7 | 8 | 8 | 7 | 7 | 7 | 8 |
| University Hill | Baldwinsville | 21 | 21 | 24 | 22 | 21 | 21 | 24 | 24 |
| | Cicero | 16 | 15 | 18 | 16 | 15 | 14 | 16 | 17 |
| | Destiny USA | 7 | 6 | 8 | 6 | 7 | 6 | 7 | 8 |
| | Downtown | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 6 |
| | Fayetteville/Manlius | 14 | 14 | 17 | 15 | 14 | 13 | 15 | 16 |
| | LaFayette | 15 | 15 | 17 | 16 | 15 | 15 | 17 | 17 |
| | Liverpool | 16 | 14 | 18 | 15 | 16 | 14 | 16 | 16 |
| | St. Joseph's Hospital | 10 | 10 | 12 | 10 | 10 | 10 | 11 | 12 |
| | University Hill | 7 | 6 | 7 | 7 | 7 | 6 | 6 | 7 |

### Traffic Volumes

Future Build traffic volumes under the Viaduct Alternative for the 2020 and 2050 analysis years and for the AM and PM peak hours for all interstate segments, ramp connections, and intersection turning movements are located in **Appendix C-3**. **Table 5-35** shows the weekday AM and PM peak hour traffic volumes for key segments on the interstate freeways and several local roadways in the project area.

Generally, traffic volume increases under the Viaduct Alternative would be fairly uniform and modest when comparing 2050 to 2020, and the evening peak would exceed the morning peak in terms of overall traffic in both years.

Traffic volumes would be higher on I-81 compared to the No Build condition because additional traffic would be attracted to I-81 in response to improvements introduced under the Viaduct Alternative. Traffic volume would decrease on some local streets and parallel portions of I-481, as these alternate routes would become comparatively less desirable after operational improvements are implemented on I-81.

Traffic increases under the Viaduct Alternative would be most pronounced on I-690 west of the West Street interchange and on I-81 south of the Court Street interchange. This is largely due to the nearby interconnect ramps from southbound I-81 to westbound I-690 and from eastbound I-690 to northbound I-81 which would be provided under the Viaduct Alternative. The additional interconnect ramps attract traffic onto the interstate segments west and north of the main I-81/I-690 interchange. This traffic would be removed from local streets and parallel routes west of Onondaga Lake.

Under the Viaduct Alternative, the southbound I-81 exit to Butternut Street and the slip ramp to Salina Street would not be provided. Traffic exiting southbound I-81 to access downtown areas would be consolidated onto Clinton Street and, therefore, traffic would increase along that arterial. High traffic volumes would persist on Almond, Harrison, and Adams Streets, as access to I-81 would continue to be provided via these roadways.

**Table 5-35**
**2020 and 2050 Viaduct Alternative Traffic Volumes at Key Locations**

| Location | Direc-ton | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct |
| I-81 Just North of Colvin Street Interchange | NB | 2,928 | 3,519 | 2,913 | 3,497 | 3,223 | 3,802 | 3,044 | 3,655 |
| | SB | 2,322 | 2,356 | 3,457 | 3,202 | 2,442 | 2,608 | 3,748 | 4,062 |
| I-81 Just South of Court/Spencer Street Interchange | NB | 2,439 | 3,263 | 5,843 | 7,170 | 2,637 | 3,461 | 6,209 | 7,665 |
| | SB | 5,161 | 5,353 | 3,466 | 4,151 | 5,582 | 5,802 | 3,752 | 4,581 |
| I-481 Just South of I-690 Interchange | NB | 3,424 | 3,342 | 2,739 | 2,594 | 3,668 | 3,606 | 2,906 | 2,766 |
| | SB | 1,995 | 1,989 | 3,501 | 3,513 | 2,206 | 2,223 | 3,746 | 3,769 |
| I-481 Just North of I-690 Interchange | NB | 2,262 | 2,236 | 2,971 | 2,750 | 2,503 | 2,475 | 3,209 | 3,010 |
| | SB | 2,692 | 2,622 | 2,415 | 2,381 | 3,036 | 2,981 | 2,747 | 2,696 |
| I-690 Just West of West Street Interchange | EB | 4,432 | 5,446 | 2,499 | 3,822 | 4,794 | 5,865 | 2,751 | 4,124 |
| | WB | 1,938 | 2,676 | 3,952 | 4,632 | 2,142 | 2,954 | 4,308 | 4,961 |
| I-690 Just East of Teall Avenue Interchange | EB | 3,545 | 3,577 | 4,708 | 4,520 | 3,672 | 3,678 | 4,877 | 4,769 |
| | WB | 3,902 | 3,765 | 3,867 | 3,859 | 4,198 | 4,025 | 3,989 | 3,972 |
| West Street Just South of Fayette Street | NB | 486 | 421 | 818 | 666 | 430 | 407 | 768 | 737 |
| | SB | 1,004 | 812 | 643 | 493 | 1,062 | 869 | 685 | 467 |
| Clinton Street Just North of Onondaga Street | NB | -- | -- | -- | -- | 192 | -- | 260 | -- |
| | SB | 537 | 506 | 474 | 516 | 410 | 556 | 321 | 542 |
| Salina Street Just North of Onondaga Street | NB | 313 | 324 | 412 | 432 | 277 | 325 | 429 | 452 |
| | SB | 356 | 387 | 278 | 337 | 431 | 414 | 363 | 346 |
| State Street Just North of Harrison Street | NB | 164 | 252 | 231 | 350 | 150 | 176 | 273 | 295 |
| | SB | 368 | 380 | 317 | 325 | 421 | 405 | 323 | 323 |
| Almond Street Just North of Harrison Street | NB | 698 | 479 | 510 | 606 | 728 | 566 | 508 | 714 |
| | SB | 1,503 | 1,568 | 986 | 883 | 1,561 | 1,664 | 1,139 | 1,059 |

**Table 5-35**
**2020 and 2050 Viaduct Alternative Traffic Volumes at Key Locations**

| Location | Direc-ton | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct | No Build | Viaduct |
| Irving Avenue Just North of Harrison Street | NB | 118 | 130 | 270 | 251 | 137 | 125 | 312 | 259 |
| | SB | 545 | 454 | 351 | 342 | 622 | 538 | 384 | 396 |
| Crouse Avenue Just North of Harrison Street | NB | 175 | 142 | 376 | 299 | 171 | 157 | 364 | 327 |
| | SB | -- | 124 | -- | 101 | -- | 183 | -- | 129 |
| Erie Boulevard Just East of Almond Street | EB | 356 | 366 | 351 | 392 | 410 | 373 | 392 | 413 |
| | WB | 269 | 275 | 388 | 453 | 307 | 301 | 439 | 463 |
| Fayette Street Just East of Almond Street | EB | 271 | 216 | 154 | 136 | 280 | 239 | 181 | 156 |
| | WB | 149 | 98 | 289 | 249 | 154 | 112 | 292 | 259 |
| Genesee Street Just East of Almond Street | EB | 351 | 275 | 453 | 468 | 363 | 479 | 470 | 543 |
| | WB | 362 | 360 | 365 | 268 | 379 | 405 | 428 | 303 |
| Harrison Street Just East of Almond Street | EB | 48 | 68 | 53 | 52 | 110 | 129 | 77 | 89 |
| | WB | 825 | 791 | 1,622 | 1,832 | 902 | 898 | 1,834 | 2,102 |
| Adams Street Just East of Almond Street | EB | 1,705 | 1,625 | 803 | 812 | 1,827 | 1,843 | 946 | 979 |

**Note:** AADT is the Average Annual Daily Traffic.

## Level of Service and Mobility

*At Project Completion & Design Year*

*Future Viaduct Alternative Level of Service*

*Freeway Level of Service:*

Based on VISSIM delay calculation, future Viaduct Alternative freeway levels of service (LOS) were calculated for all the basic freeway segments, freeway ramps, and weaving segments within the Project Area - (see **Appendix C-3**). **Table 5-36** shows 2020 and 2050 freeway LOS conditions resulting from the Viaduct Alternative traffic on selected critical sections of I-81, I-481, and I-690. Since the Viaduct Alternative would correct most non-standard and non-conforming highway features within the Project Area, and make improvements at existing/No Build locations identified as congested, it would substantially improve traffic operational conditions on I-81, I-481, and I-690 during the AM and PM peak hours. In comparison to 2020 and 2050 No Build condition LOS results, the numbers of freeway segments, ramp junctions, and weaving sections operating unacceptably would be reduced by 78 and 43 percent, respectively, under the Viaduct Alternative.

Freeway segments that would operate at unacceptable LOS (i.e., LOS E or LOS F) include:

- Southbound I-81 between Eastbound I-690 off-ramp and Eastbound I-690 on-ramp (2020 AM peak hour)

- Eastbound I-690 between Exit 8 (Hiawatha Boulevard) and Exit 9 (Bear Street) (2050 AM peak hour)
- Eastbound I-690 between Exit 9 (Bear Street) and the Interchange 10 (N. Geddes Street) on-ramp (2050 AM peak hour)

Ramp merge areas that would operate at unacceptable LOS (i.e., LOS E or LOS F) include:

- Eastbound I-690 at the Interchange 8 (State Fair Blvd) on-ramp (2050 AM peak hour)
- Westbound I-690 at the Interchange 9 (Bear Street) on-ramp (2050 PM peak hour)
- Ramp diverge areas that would operate at LOS E or worse in 2020 and 2050 include:
- Southbound I-81 at Eastbound I-690 off-ramp (2020 AM peak hour)
- Southbound I-81 at Exit 17 (S. State Street, S. Salina Street, and Brighton Avenue)(2020/2050 AM peak hour)
- Eastbound I-690 at Exit 8 (Hiawatha Boulevard) (2050 AM peak hour)
- Eastbound I-690 at Exit 9 (Bear Street) (2050 AM peak hour)
- Eastbound I-690 at the exit to Northbound/Southbound former I-81 (2020 AM peak hour)

Weaving sections that would operate at unacceptable LOS (i.e., LOS E or LOS F) include:

- Southbound I-81 between the Bear Street on-ramp and Spencer Street off-ramp (2020 AM peak hour)

These results indicate that the LOS for a number of southbound I-81 and eastbound I-690 freeway sections would improve from unacceptable to acceptable levels of service between 2020 and 2050. This is because that in comparison to 2020, density (or throughput) would be lower on these sections in 2050 due to upstream congestion on eastbound I-690 between the State Fair Boulevard on-ramp and Exit 8 (to Hiawatha Boulevard) which effectively would meter traffic entering the downstream sections.

**Table 5-36**
**2020 and 2050 Viaduct Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| **Northbound I-81** | | | | | | | | | |
| between Interchange 16 (US 11) on-ramp and Interchange 16A (I-481) off-ramp | BFS | 10.3 | A | 12.4 | B | 12.8 | B | 13.8 | B |
| between Interchange 16A (I-481 North) off and on-ramps | BFS | 5.9 | A | 16.8 | B | 6.5 | A | 10 | A |
| between MLK Jr. E. off and Adams St off-ramp | BFS | 17.1 | B | 21.1 | C | 21.3 | C | 22 | C |
| between Adams St off-ramp and Eastbound I-690 off-ramp | BFS | 19.4 | C | 24 | C | 21.9 | C | 25.8 | C |
| between Eastbound I-690 off-ramp and Harrison St on-ramp | BFS | 10.6 | A | 15.8 | B | 12.7 | B | 20.7 | C |
| between Westbound I-690 off-ramp and Pearl St on-ramp | BFS | 7 | A | 18 | B | 7.6 | A | 26.3 | D |
| between Westbound I-690 on-ramp and Eastbound I-690 on-ramp | BFS | 9.8 | A | 24.8 | C | 10.1 | A | 26.3 | D |
| between Court St on-ramp and off-ramp | BFS | 8.8 | A | 25.3 | C | 9.6 | A | 29.4 | D |
| between Interchange 23 (Hiawatha Blvd) off and on-ramps | BFS | 9.9 | A | 21.5 | C | 10.1 | A | 27.2 | D |

**Table 5-36**
**2020 and 2050 Viaduct Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| between Interchange 23 (Hiawatha Blvd) on-ramp and Exit 25 (7th North St) | BFS | 13.8 | B | 12.5 | B | 16.1 | B | 23.6 | C |
| between Exit 29S (Southbound I-481) and Southbound NY 481 on-ramp | BFS | 6.8 | A | 14.1 | B | 7.4 | A | 25.2 | C |
| between Exit 29N (Northbound NY 481) and Northbound I-481 on-ramp | BFS | 6.3 | A | 13.2 | B | 6.6 | A | 14.6 | B |
| at Exit 16A (Northbound I-481) | Diverge | 10.1 | B | 10.2 | B | 12.6 | B | 12 | B |
| at Adams St off-ramp | Diverge | 17.1 | B | 21.6 | C | 27.7 | C | 22 | C |
| at Eastbound I-690 off-ramp | Diverge | 19.4 | B | 24.0 | C | 15.6 | B | 22.5 | C |
| at Westbound I-690 off-ramp | Diverge | 10.9 | B | 26.6 | C | 12.3 | B | 26.9 | C |
| at Exit 23 (Hiawatha Blvd) off-ramp | Diverge | 7.2 | A | 14.0 | B | 6.9 | A | 14.1 | B |
| at Exit 29S (Southbound I-481) | Diverge | 9.3 | A | 18.9 | B | 9.9 | A | 20.5 | C |
| at S. Salina St on-ramp | Merge | 17.5 | B | 16.5 | B | 19.4 | B | 17.4 | B |
| at Harrison St on-ramp | Merge | 9.2 | A | 22.8 | C | 8.3 | A | 25.8 | C |
| at Pearl St on-ramp | Merge | 5.9 | A | 17.6 | B | 6.0 | A | 18.1 | B |
| at Westbound I-690 on-ramp | Merge | 11.9 | B | 23.2 | C | 11.4 | B | 24.3 | C |
| at Court St on-ramp | Merge | 15.4 | B | 26.2 | C | 15.4 | B | 26.6 | C |
| at Interchange 23 (Hiawatha Blvd) on-ramp | Merge | 13.4 | B | 26.9 | C | 13.6 | B | 29.2 | D |
| at Interchange 29S (I-481) on-ramp | Merge | 8.5 | A | 16.3 | B | 9.3 | A | 18.2 | B |
| between Eastbound I-690 on-ramp and Court St off-ramp | Weave | 10.8 | B | 34.2 | D | 11.2 | B | 26.1 | C |
| between Interchange 17 (E. Colvin St) on-ramp and MLK Jr. E off-ramp | Weave | 16.5 | B | 16.5 | B | 20.2 | C | 17.0 | B |
| between Interchange 29N (NY 481) on and off-ramps | Weave | 7.3 | A | 17.7 | B | 7.8 | A | 19.7 | B |
| **Southbound I-81** | | | | | | | | | |
| between Interchange 30 (NY 31) and Interchange 29N (I-481) off-ramp | BFS | 21.0 | C | 11.9 | B | 23.7 | C | 13.6 | B |
| between Exit 29N (NY 481 NB) and I-481 Northbound on-ramp | BFS | 20.4 | C | 11.1 | B | 23.1 | C | 12.8 | B |
| between Exit 29S (I-481 SB) and NY 481 Southbound on-ramp | BFS | 17.5 | B | 9.7 | A | 19.9 | C | 11.1 | B |
| between Exits 23A (Hiawatha Blvd) and Old Liverpool Rd on-ramp | BFS | 26.3 | D | 20.4 | C | 28.2 | D | 21.0 | C |
| between Old Liverpool Rd./NY 370 on-ramp and Bear St on-ramp | BFS | 24.4 | C | 18.8 | C | 25.7 | C | 18.4 | C |
| between Spencer St off-ramp and Westbound I-690 off-ramp | BFS | 26.2 | D | 21.1 | C | 26.3 | D | 20.9 | C |
| between Eastbound I-690 off-ramp and Eastbound I-690 on-ramp | BFS | 37.8 | E | 15.7 | B | 24.7 | C | 18.2 | C |
| between Harrison St off-ramp and Westbound I-690 on-ramp | BFS | 16.3 | B | 16.2 | B | 15.2 | B | 17.9 | B |
| between Westbound I-690 on-ramp and Adams St on-ramp | BFS | 20.4 | C | 21.5 | C | 19.0 | C | 24.9 | C |
| between Adams St on-ramp and MLK Jr. Eon-ramp | BFS | 15.0 | B | 22.3 | C | 13.9 | B | 21.6 | C |
| between Interchange 16A (I-481) off and on-ramps | BFS | 11.0 | B | 16.2 | B | 10.1 | A | 19.4 | C |
| at Exit 29N (NY 481) | Diverge | 21.2 | C | 12.2 | B | 24.2 | C | 13.9 | B |
| at Westbound I-690 off-ramp | Diverge | 19.6 | B | 17.5 | B | 27.2 | C | 20.0 | B |
| at Clinton St off-ramp | Diverge | 23.8 | C | 16.8 | B | 27.0 | C | 16.5 | B |
| at Eastbound I-690 off-ramp | Diverge | 36.0 | E | 19.1 | C | 24.2 | C | 20.4 | C |
| at Harrison St off-ramp | Diverge | 30.8 | D | 18.3 | C | 22.6 | C | 20.7 | C |
| at Exit 17 (S. State St, S. Salina St, Brighton Av) | Diverge | 18.4 | B | 37.1 | E | 17.6 | B | 41.2 | F |
| at Exit to NB I-481 off-ramp | Diverge | 7.2 | A | 14.4 | B | 6.5 | A | 18.1 | B |

**Table 5-36**
**2020 and 2050 Viaduct Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| at Interchange 29N (NY 481) on-ramp | Merge | 24.5 | C | 15.7 | B | 26.4 | C | 16.7 | B |
| at Old Liverpool Rd./NY 370 on-ramp | Merge | 29.8 | D | 22.8 | C | 30.6 | D | 23.0 | C |
| at Westbound I-690 on-ramp | Merge | 13.4 | B | 14.9 | B | 13.0 | B | 16.8 | B |
| at Adams St on-ramp | Merge | 14.9 | B | 19.4 | B | 14.0 | B | 22.3 | C |
| at MLK Jr. Eon-ramp | Merge | 14.2 | B | 33.8 | D | 11.5 | B | 31.6 | D |
| at Interchange 16A (I-481) on-ramp | Merge | 10.0 | A | 14.9 | B | 9.5 | A | 17.4 | B |
| between Interchange 29S (I-481) on and off-ramps | Weave | 19.3 | B | 11.5 | B | 21.3 | C | 13.3 | B |
| between Bear St on-ramp and Spencer St off-ramp | Weave | 35.8 | E | 19.7 | B | 28.3 | D | 19.1 | B |
| Between Eastbound I-690 on-ramp and Harrison St off-ramp | Weave | 32.6 | D | 15.4 | B | 24.0 | C | 17.7 | B |
| **Northbound I-481** | | | | | | | | | |
| between Interchange 1 (Brighton Av, Rock Cut Rd) off and on-ramps | BFS | 7.4 | A | 8.6 | A | 7.9 | A | 9.7 | A |
| between Interchange 3E (East NY 5 ) off and on-ramps | BFS | 12.8 | B | 9.5 | A | 13.8 | B | 10.8 | A |
| between Interchange 3W (West NY 5 ) off and on-ramps | BFS | 12.8 | B | 10.5 | A | 13.7 | B | 11.8 | B |
| between Interchange 3W (West NY 5 ) on-ramp and Exit 4 (West I-690 ) | BFS | 19.5 | C | 14.6 | B | 20.9 | C | 15.6 | B |
| between Interchange 4 (I-690) off and on-ramps | BFS | 12.4 | B | 11.3 | B | 13.3 | B | 12.6 | B |
| between Interchange 4 (East I-690) on-ramp and Exit 5E (Kirkville Rd) | BFS | 18.8 | C | 22.6 | C | 20.5 | C | 24.9 | C |
| between Interchange 9N (North I-81 ) off and on-ramps | BFS | 6.6 | A | 14 | B | 7 | A | 15.9 | B |
| between Interchange 9S (North I-81 ) off and on-ramps | BFS | 9.5 | A | 26.4 | D | 9.9 | A | 28.7 | D |
| at Exit 3E (East NY 5 ) | Diverge | 10.6 | B | 8.8 | A | 11.1 | B | 10 | A |
| at Exit 4 (West I-690 ) | Diverge | 15.6 | B | 12.2 | B | 16.7 | B | 13.3 | B |
| at Exit 5E (Kirkville Rd) | Diverge | 13.7 | B | 19 | B | 15.6 | B | 21.7 | C |
| at Exit 9N (North I-81 ) | Diverge | 7.3 | A | 16.3 | B | 8 | A | 18.6 | B |
| at Interchange 1 (Brighton Av, Rock Cut Rd) on-ramp | Merge | 9.2 | A | 8.7 | A | 9.8 | A | 9.9 | A |
| at Interchange 3W (West NY 5 ) on-ramp | Merge | 18 | B | 14.4 | B | 19.5 | B | 15.3 | B |
| at Interchange 4 (East I-690) on-ramp | Merge | 13 | B | 16.1 | B | 14.2 | B | 17.8 | B |
| at Interchange 5W (Kirkville Rd) on-ramp | Merge | 10 | A | 13.4 | B | 10.9 | B | 15.1 | B |
| at Interchange 9S (North I-81 ) on-ramp | Merge | 7.1 | A | 18.2 | B | 7.4 | A | 19.8 | B |
| between I-81 on-ramp and Exit 1 (Brighton Av, Rock Cut Rd) | Weave | 5.9 | A | 8.4 | A | 6.2 | A | 9.6 | A |
| between Interchange 3E (East NY 5 ) on-ramp and Exit 3W (West NY 5 ) | Weave | 10.3 | B | 8.7 | A | 11.0 | B | 9.7 | A |
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 5W (Kirkville Rd) | Weave | 13.0 | B | 14.8 | B | 13.8 | B | 16.3 | B |
| between Interchange 9N (North I-81 ) on-ramp and Exit 9S (North I-81 ) | Weave | 8.2 | A | 22.4 | C | 8.7 | A | 24.9 | C |
| **Southbound I-481** | | | | | | | | | |
| between Interchange 9S (North I-81 ) off-and on-ramps | BFS | 17.7 | B | 7.8 | A | 20 | C | 11.6 | B |
| between Interchange 9N (North I-81 ) off-and on-ramps | BFS | 25.2 | C | 10.2 | A | 29 | D | 14.9 | B |
| between Interchange 9N (North I-81 ) on-ramp and Exit 8 (Northern Blvd) | BFS | 20.2 | C | 12.3 | B | 23.3 | C | 13.4 | B |
| between Interchange 6 (I-90) on-ramp and Exit 5W (Kirkville Rd) | BFS | 20.7 | C | 17.6 | B | 23.3 | C | 19.4 | C |
| between Interchange 5W (Kirkville Rd) off-and on-ramps | BFS | 17.6 | B | 16.2 | B | 20 | C | 17.9 | B |
| between Interchange 5E (Kirkville Rd) off-and on-ramps | BFS | 18.8 | C | 15.2 | B | 21.7 | C | 17.5 | B |

**Table 5-36**
**2020 and 2050 Viaduct Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 4 (West I-690 ) | BFS | 22.3 | C | 20.2 | C | 25.4 | C | 22.7 | C |
| between Interchange 4 (I-690) off and on-ramps | BFS | 10.7 | A | 12.4 | B | 12.4 | B | 14 | B |
| between Interchange 4 (East I-690) on-ramp and Exit 3W (West NY 5 ) | BFS | 11.3 | B | 19.5 | C | 12.4 | B | 20.8 | C |
| between Interchange 3W (West NY 5 ) off-and on-ramps | BFS | 10.0 | A | 17.7 | B | 11.0 | A | 19.3 | C |
| between Interchange 3E (East NY 5 ) off and on-ramps | BFS | 7.7 | A | 9.3 | A | 8.5 | A | 10.3 | A |
| between E. Brighton Av off-ramp and North I-81 off-ramp | BFS | 21.8 | C | 8.6 | A | 23.4 | C | 9.7 | A |
| at Exit 9S (North I-81 ) | Diverge | 27.4 | C | 11.4 | B | 30.4 | D | 16.8 | B |
| at Exit 6 (I-90) | Diverge | 12.6 | B | 12.4 | B | 14.5 | B | 13.9 | B |
| at Exit 5W (Kirkville Rd) | Diverge | 15 | B | 12.2 | B | 16.9 | B | 13.4 | B |
| at Exit 4 (West I-690 ) | Diverge | 25.4 | C | 20.3 | C | 29.1 | D | 23.2 | C |
| at Exit 3W (West NY 5 ) | Diverge | 10.3 | B | 18.6 | B | 11.3 | B | 19.7 | B |
| at Exit 1 (Brighton Av) | Diverge | 12.2 | B | 12.3 | B | 13.5 | B | 13 | B |
| at Northbound I-81 and Southbound I-81 ramps | Diverge | 15.1 | B | 11.3 | B | 16.2 | B | 12.5 | B |
| at Interchange 9N (North I-81 ) on- ramp | Merge | 18.3 | B | 8.5 | A | 21.5 | C | 10.5 | B |
| at Interchange 5E (Kirkville Rd) on- ramp | Merge | 15.4 | B | 14.3 | B | 17.5 | B | 16.1 | B |
| at Interchange 4 (East I-690) on- ramp | Merge | 10.4 | B | 19.7 | B | 11.2 | B | 20.8 | C |
| at Interchange 3E (East NY 5 ) on- ramp | Merge | 8.2 | A | 10.9 | B | 8.9 | A | 11.6 | B |
| between Interchange 9S (North I-81 ) on- ramp and Exit 9N (North I-81 ) | Weave | 17.8 | B | 7.9 | A | 20.7 | C | 11.2 | B |
| between Interchange 5W (Kirkville Rd) on-ramp and Exit 5E (Kirkville Rd) | Weave | 14.5 | B | 12.2 | B | 17.1 | B | 14.1 | B |
| between Interchange 3W (West NY 5 ) on- ramp and Exit 3E (East NY 5 ) | Weave | 10.3 | B | 19.9 | B | 11.1 | B | 23.5 | C |
| **Eastbound I-690** | | | | | | | | | |
| between Exit 8 (Hiawatha Blvd) and Exit 9 (Bear St) | BFS | 28.8 | D | 15.1 | B | 110.4 | F | 16.6 | B |
| between Exit 9 (Bear St) and Interchange 10 (N. Geddes St) on- ramp | BFS | 27.8 | D | 14.3 | B | 114.6 | F | 15.7 | B |
| between Northbound I-81 off-ramp and West St on-ramp | BFS | 20.9 | C | 13.3 | B | 17.3 | B | 14 | B |
| between Interchange 11 (West St) on-ramp and I-81 Southbound on-ramp | BFS | 21.9 | C | 17.5 | B | 19.5 | C | 18.2 | C |
| between Almond St on-ramp and Northbound I-81 on-ramp | BFS | 24.7 | C | 20.9 | C | 21.9 | C | 22.5 | C |
| between Interchange 14 (Teall Av) off and on-ramps | BFS | 18.9 | C | 21.8 | C | 18.2 | C | 23 | C |
| at Exit 8 (Hiawatha Blvd) | Diverge | 23.5 | C | 15.1 | B | 80.2 | F | 16.3 | B |
| at Exit 9 (Bear St) | Diverge | 23.4 | C | 13.1 | B | 74.1 | F | 14.3 | B |
| at Exit to Northbound/Southbound I-81 | Diverge | 42.3 | F | 22.3 | C | 24.1 | C | 22.8 | C |
| at Exit 14 (Teall Av) | Diverge | 27.5 | C | 28.2 | D | 27.3 | C | 31.3 | D |
| at Interchange 8 (State Fair Blvd) on-ramp | Merge | 21 | C | 14.7 | B | 71.4 | F | 15.9 | B |
| at Interchange 11 (West St) on-ramp | Merge | 14.3 | B | 11.9 | B | 13.3 | B | 12.7 | B |
| at Southbound I-81 on-ramp | Merge | 20.3 | C | 18.1 | B | 18.6 | B | 19.8 | B |
| at Northbound I-81 on-ramp | Merge | 18.7 | B | 14.9 | B | 17.2 | B | 17.5 | B |
| at Almond St on-ramp | Merge | 20.8 | C | 22.6 | C | 19.6 | B | 24.1 | C |
| at Interchange 14 (Teall Av) on-ramp | Merge | 18.7 | B | 22.1 | C | 18.1 | B | 23.1 | C |
| between Interchange 10 (N. Geddes St) on- ramp and Exit 11 (West St) | Weave | 32.2 | D | 19.4 | B | 27.6 | C | 25.9 | C |

**Table 5-36**
**2020 and 2050 Viaduct Alternative Freeway LOS Analysis**

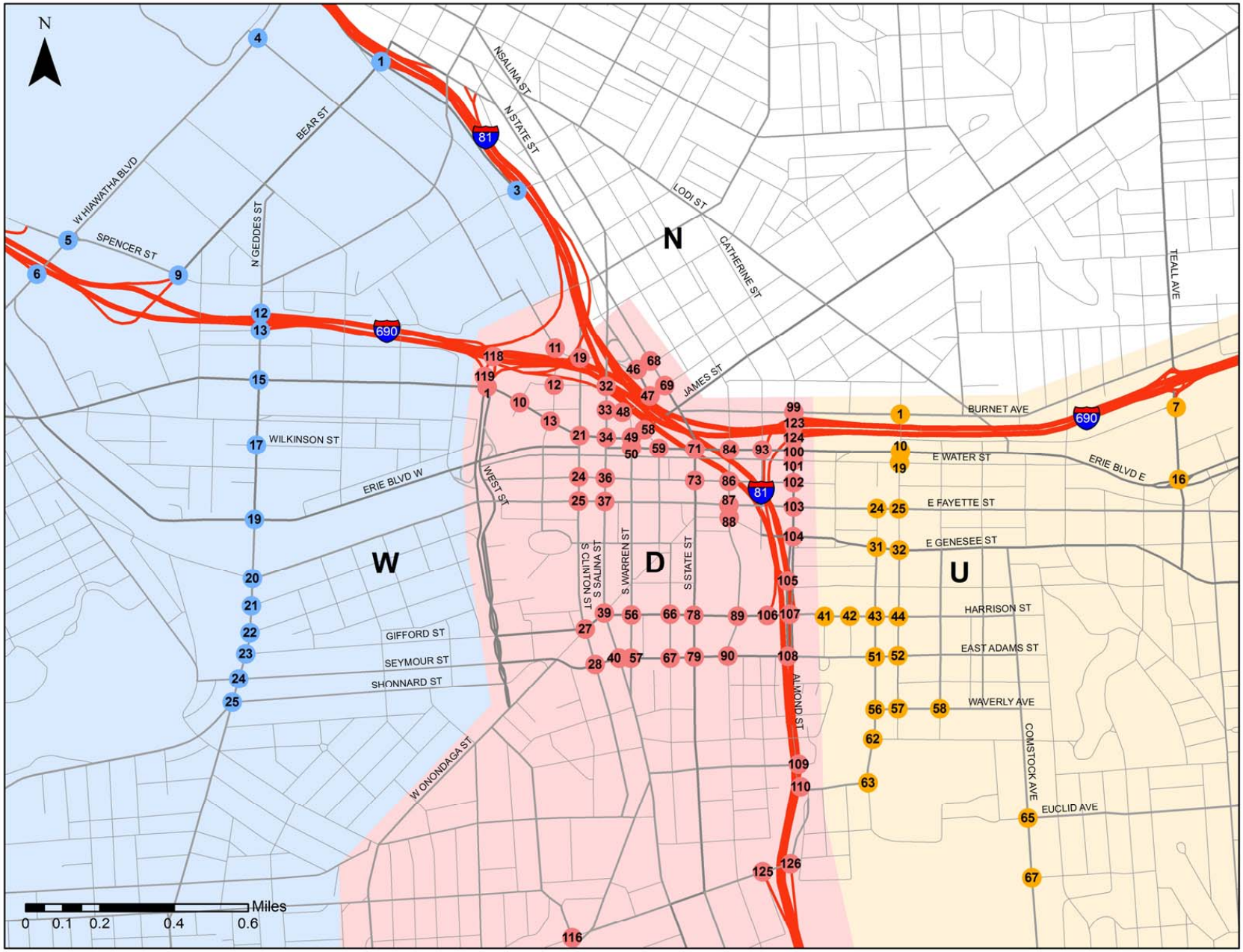
| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| **Westbound I-690** | | | | | | | | | |
| between Interchange 14 (Teall Av) off and on-ramps | BFS | 18.7 | C | 21.4 | C | 20.9 | C | 15.1 | B |
| between Southbound I-81/Almond St. off-ramp and Northbound I-81 off-ramp | BFS | 14.3 | B | 21.4 | C | 15.4 | B | 23.3 | C |
| between North I-81 off-ramp and West St off-ramp | BFS | 13.3 | B | 19 | C | 14.7 | B | 22 | C |
| between Exit 11 (West St) off-ramp and Northbound I-81 on-ramp | BFS | 9 | A | 12.7 | B | 10.1 | A | 20.2 | C |
| between Exit 10 (N. Geddes St) and Interchange 9 (Bear St) on-ramp | BFS | 11.5 | B | 21.3 | C | 12.7 | B | 25.2 | C |
| between Interchange 9 (Bear St) and Interchange 8 (State Fair Blvd) on-ramps | BFS | 13.8 | B | 26.4 | D | 17.4 | B | 13.4 | B |
| between Interchange 8 (Hiawatha Blvd) on-ramp and Exit 7 (NY 297) | BFS | 15.3 | B | 27.2 | D | 14.9 | B | 26.1 | D |
| at Exit 14 (Teall Av) | Diverge | 17.7 | B | 20.3 | C | 18.7 | B | 21.3 | C |
| at Northbound I-81 off-ramp | Diverge | 14 | B | 20.7 | C | 15.2 | B | 21.5 | C |
| at Almond St off-ramp | Diverge | 14.1 | B | 23.9 | C | 34.6 | D | 21.6 | C |
| at Exit 11 (West St) off-ramp | Diverge | 8.5 | A | 12.2 | B | 9.6 | A | 12.8 | B |
| at Exit 14 (Teall Av) on-ramp | Merge | 25.6 | C | 30.6 | D | 34.1 | D | 29.4 | D |
| at Northbound I-81 on-ramp | Merge | 11.8 | B | 18.9 | B | 14.1 | B | 19.5 | B |
| at Southbound I-81 on-ramp | Merge | 16.9 | B | 22.3 | C | 20.1 | C | 22.3 | C |
| at Interchange 9 (Bear St) on-ramp | Merge | 14.0 | B | 32.2 | D | 15.1 | B | 45.7 | F |
| at Interchange 8 (Hiawatha Blvd) on-ramp | Merge | 13.6 | B | 22.7 | C | 14.3 | B | 26.6 | C |
| between Exit 11 (West St) on-ramp and Exit 10 (N. Geddes St) off-ramp | Weave | 15.2 | B | 25.5 | C | 15.6 | B | 26.6 | C |

*Intersection Level of Service:*

Based on VISSIM delay calculation, **Table 5-37** summarizes intersection LOS for the 2020 and 2050 Viaduct Alternative for selected signalized and unsignalized intersections during the weekday AM and PM peak hours (More detailed LOS analyses for 260 intersections are included in **Appendix C-3)**. Refer to **Figure 5-11** for a reference map of intersection locations under the Viaduct Alternative. Note that the table includes 103 intersections because the Viaduct Alternative would eliminate some existing intersections and add new intersections in the Project Area. Of the 103 intersections, three intersections would operate at LOS E or LOS F during the 2020 PM peak hour, one intersection during the 2050 AM peak hour, and 12 intersections during the 2050 PM peak hour. The following is a summary of locations that would operate at unacceptable levels (LOS E or F):

- Intersection D-58 – Oswego Boulevard and James Street (2020 PM peak hour)
- Intersection D-68 – US 11/State Street and Hickory Street (2050 PM peak hour)
- Intersection U-4 – Westmoreland Avenue and Burnet Avenue (2050 PM peak hour)
- Intersection U-7 – Teall Avenue and Canal Street (2050 PM peak hour)
- Intersection U-16 – Teall Avenue and Erie Boulevard (2050 PM peak hour)
- Intersection U-67 – Comstock Avenue and Stratford Street (2050 AM/PM peak hours)

12.21.16




Viaduct Alternative Intersection Locations

**I-81 Viaduct Project**

**Figure 5-11**

- Intersection W-3 – I-81 South On-Ramp/Genant Drive & Bear Street (2020 AM peak hour)
- Intersection W-15 – Geddes Street and NY 5/Genesee Street (2020 and 2050 PM peak hours)
- Intersection W-17 – Geddes Street and Wilkinson Street (2050 PM peak hour)
- Intersection W-19 – Geddes Street and Erie Boulevard (2020/2050 PM peak hours)
- Intersection W-20 – Geddes Street and Fayette Street (2050 PM peak hour)
- Intersection W-21 – Geddes Street and Marcellus Street (2050 PM peak hour)
- Intersection W-22 – Geddes Street and Otisco Street (2050 PM peak hour)
- Intersection W-23 – Geddes Street and Gifford Street (2050 PM peak hour)

The pair of high speed interconnect ramps from eastbound I-690 to northbound I-81 and from southbound I-81 to westbound I-690 introduced under the Viaduct Alternative would attract a greater number of motorists to use I-690 interchange 10 at Geddes Street. The associated higher PM peak hour traffic volumes would cause two intersections on Geddes Street to become saturated in 2020. Traffic volume increases in 2050 would cause an additional five, for a total of seven, intersections to reach saturation in the PM peak hour. Mitigation measures may be introduced in the future to improve LOS at intersections operating at saturated levels.

**Table 5-37**
**2020 and 2050 Viaduct Alternative Intersection LOS Analysis**

| | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| ID | Intersection Name | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West St. at NY 5/W. Genesee St. | 19.5 | B | 24.6 | C | 33.2 | C | 32.6 | C |
| D-10 | Wallace St. at NY 5/W. Genesee St. | 15.7 | B | 1.0 | A | 7.2 | A | 6.7 | A |
| D-11 | N. Franklin St. /Butternut St. at N. Franklin St. | 19.5 | B | 19.3 | B | 12.1 | B | 24.0 | C |
| D-12 | N. Franklin St. at Herald Pl | 7.0 | A | 14.3 | B | 7.6 | A | 13.0 | B |
| D-13 | N. Franklin St. at NY 5/W. Genesee St. | 20.5 | C | 21.2 | C | 16.1 | B | 18.3 | B |
| D-19 | N. Clinton St. at Webster Landing | 3.7 | A | 1.4 | A | 5.9 | A | 1.0 | A |
| D-21 | N. Clinton St. at NY 5/W. Genesee St. | 24.6 | C | 35.6 | D | 23.8 | C | 19.0 | B |
| D-24 | S. Clinton St. at W. Washington St. | 14.7 | B | 19.5 | B | 7.2 | A | 19.0 | B |
| D-25 | S. Clinton St. at W. Fayette St. | 13.6 | B | 5.7 | A | 8.0 | A | 8.3 | A |
| D-27 | S. Clinton St. at W. Onondaga St. | 15.6 | B | 17.9 | B | 13.4 | B | 11.7 | B |
| D-28 | S. Clinton St. at W. Adams St. | 9.0 | A | 15.8 | B | 10.5 | B | 20.5 | C |
| D-32 | N. Salina St. at Herald Pl | 42.9 | D | 18.4 | B | 9.4 | A | 25.9 | C |
| D-33 | N. Salina St. at E./W. Willow St. | 43.4 | D | 7.0 | A | 12.4 | B | 6.7 | A |

**Table 5-37**
**2020 and 2050 Viaduct Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-34 | N. Salina St. at NY 5/W. Genesee St./James St. | 21.8 | C | 17.1 | B | 14.5 | B | 14.8 | B |
| D-36 | S. Salina St. at E./W. Washington St. | 17.7 | B | 15.5 | B | 14.9 | B | 21.1 | C |
| D-37 | S. Salina St. at E./W. Fayette St. | 13.8 | B | 8.7 | A | 14.3 | B | 10.1 | B |
| D-39 | S. Salina St. at Harrison St. and Onondaga St. | 29.1 | C | 32.1 | C | 29.3 | C | 42.0 | D |
| D-40 | S. Salina St. at E./W. Adams St. | 38.7 | D | 25.8 | C | 19.8 | B | 32.3 | C |
| D-46 | Pearl St. at Hickory St. | 0.8 | A | 4.2 | A | 4.9 | A | 10.4 | B |
| D-47 | Pearl St. at E. Willow St. | 0.8 | A | 1.4 | A | 0.7 | A | 1.3 | A |
| D-48 | N. Warren St. at E. Willow St. | 2.5 | A | 10.2 | B | 5.0 | A | 4.9 | A |
| D-49 | N. Warren St. at NY 5/James St. | 13.3 | B | 23.6 | C | 4.8 | A | 7.5 | A |
| D-50 | N. Warren St. at E. Erie Blvd. | 0.2 | A | 0.2 | A | 0.3 | A | 0.1 | A |
| D-56 | S. Warren St. at Harrison St. | 22.9 | C | 15.6 | B | 11.4 | B | 28.4 | C |
| D-57 | S. Warren St. at E. Adams St. | 6.5 | A | 9.9 | A | 9.2 | A | 9.6 | A |
| D-58 | Oswego Blvd. at James St. | 27.9 | C | 67.4 | E | 3.3 | A | 11.4 | B |
| D-59 | NY 5/Oswego Blvd./ at Montgomery St. | 7.5 | A | 13.7 | B | 6.1 | A | 13.3 | B |
| D-66 | Montgomery St. at Harrison St. | 6.5 | A | 12.9 | B | 5.5 | A | 9.4 | A |
| D-67 | Montgomery St. at E. Adams St. | 6.9 | A | 13.3 | B | 7.6 | A | 12.1 | B |
| D-68 | US 11/N. State St. at Hickory St. | 1.3 | A | 2.0 | A | 1.6 | A | 40.3 | E |
| D-69 | US 11/N. State St. at E. Willow St. | 11.2 | B | 15.2 | B | 12.7 | B | 22.9 | C |
| D-71 | US 11/S. State St. at NY 5/Erie Blvd. E. | 38.4 | D | 20.7 | C | 20.2 | C | 19.1 | B |
| D-73 | US 11/S. State St. at E. Washington St. | 14.4 | B | 17.8 | B | 12.4 | B | 36.6 | D |
| D-78 | US 11/S. State St. at Harrison St. | 23.6 | C | 12.0 | B | 8.2 | A | 20.6 | C |
| D-79 | US 11/S. State St. at E. Adams St. | 11.6 | B | 16.1 | B | 7.2 | A | 16.1 | B |
| D-83 | N. Townsend St. at Westbound I-690 Off-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-84 | N./S. Townsend St. at NY 5/Erie Blvd. E. | 15.0 | B | 15.5 | B | 26.7 | C | 18.2 | B |
| D-86 | S. Townsend St. at E. Washington St. | 7.8 | A | 23.4 | C | 7.4 | A | 15.5 | B |
| D-87 | S. Townsend St. at E. Fayette St. | 10.1 | B | 19.0 | B | 7.7 | A | 14.8 | B |
| D-88 | S. Townsend St. at NY 92/E. Genesee St. | 14.9 | B | 28.5 | C | 8.6 | A | 26.8 | C |
| D-89 | S. Townsend St. at Harrison St. | 18.0 | B | 17.3 | B | 14.3 | B | 14.8 | B |
| D-90 | S. Townsend St. at E. Adams St. | 27.1 | C | 39.8 | D | 25.8 | C | 21.3 | C |
| D-92 | N. McBride St. at EB I-690 On-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

**Table 5-37**
**2020 and 2050 Viaduct Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-93 | N./S. McBride St. at NY 5/Erie Blvd. E. | 21.6 | C | 10.2 | B | 9.6 | A | 15.5 | B |
| D-99 | Catherine St. at Burnet Ave. | 5.5 | A | 15.8 | B | 6.8 | A | 15.6 | B |
| D-100 | Almond St./Catherine St. at NY 5/Erie Blvd. E. | 10.5 | B | 14.5 | B | 10.8 | B | 19.8 | B |
| D-101 | Almond St. at E. Water St. | 4.9 | A | 21.4 | C | 6.4 | A | 31.8 | C |
| D-102 | Almond St. at E. Washington St. | 6.5 | A | 7.9 | A | 9.2 | A | 11.5 | B |
| D-103 | Almond St. at E. Fayette St. | 11.7 | B | 10.8 | B | 12.2 | B | 9.5 | A |
| D-104 | Almond St. at NY 92/E. Genesee St. | 27.3 | C | 34.8 | C | 29.2 | C | 39.9 | D |
| D-105 | Almond St. at Southbound I-81 Off-Ramp | 19.1 | B | 11.3 | B | 15.5 | B | 13.6 | B |
| D-106 | Harrison St. at Southbound I-81 Off-Ramp | 4.9 | A | 0.9 | A | 2.6 | A | 1.0 | A |
| D-107 | Almond St. at Harrison St. | 52.8 | D | 25.2 | C | 45.4 | D | 26.4 | C |
| D-108 | Almond St. at E. Adams St. | 39.7 | D | 32.4 | C | 47.2 | D | 38.3 | D |
| D-109 | Almond St. at Burt St. | 18.1 | B | 15.0 | B | 27.2 | C | 30.6 | C |
| D-110 | Almond St. at Van Buren St. | 15.6 | B | 9.7 | A | 13.0 | B | 10.6 | B |
| D-116 | Midland Ave. at W. MLK Jr | 4.5 | A | 23.6 | C | 2.4 | A | 4.9 | A |
| D-118 | West St. at Westbound I-690 Ramps | 13.6 | B | 19.6 | B | 11.7 | B | 19.2 | B |
| D-119 | West St. at Eastbound I-690 Ramps | 20.2 | C | 10.0 | B | 16.7 | B | 8.7 | A |
| D-120 | Southbound I-81 Off-ramp and Willow St. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-121 | Pearl St. at James St. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-122 | Almond St. and MLK Jr. E | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-123 | Catherine St. at Westbound I-690 Off-Ramp | 9.1 | A | 11.0 | B | 8.8 | A | 11.0 | B |
| D-124 | Catherine St. at Eastbound I-690 On-ramp | 2.4 | A | 2.7 | A | 2.2 | A | 3.3 | A |
| D-125 | MLK Jr. E. at Southbound I-81 On-Ramp | 1.9 | A | 2.3 | A | 1.8 | A | 2.1 | A |
| D-126 | MLK Jr. E. at Northbound I-81 Off-Ramp | 34.7 | C | 9.3 | A | 34.6 | C | 10.6 | B |
| D-127 | State Route at New Connecting Rd. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-128 | E Brighton at New Connecting Rd. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-139 | Salina St. at SB I-81 Exit 19 Off-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-1 | N. Crouse Ave. at Burnet Ave. | 15.0 | B | 15.0 | B | 13.9 | B | 15.1 | B |
| U-4 | Westmoreland Ave. at Burnet Ave. | 13.3 | B | 23.6 | C | 17.1 | C | 45.3 | E |

**Table 5-37**
**2020 and 2050 Viaduct Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| U-7 | Teall Ave. at Canal St. | 1.8 | A | 16.8 | C | 1.5 | A | 38.6 | E |
| U-10 | N./S. Crouse Ave. at Erie Blvd. E. | 19.3 | B | 18.9 | B | 17.5 | B | 19.4 | B |
| U-16 | Teall Ave. at Erie Blvd. E. | 43.5 | D | 47.6 | D | 44.7 | D | 57.4 | E |
| U-19 | S. Crouse Ave. at E. Water St. | 8.2 | A | 14.8 | B | 8.8 | A | 15.3 | C |
| U-24 | Irving Ave. at E. Fayette St. | 7.8 | A | 8.4 | A | 8.1 | A | 9.5 | A |
| U-25 | S. Crouse Ave. at E. Fayette St. | 12.5 | B | 14.6 | B | 12.2 | B | 15.9 | B |
| U-31 | Irving Ave. at NY 92/E. Genesee St. | 23.3 | C | 33.1 | C | 19.0 | B | 39.5 | D |
| U-32 | S. Crouse Ave. at NY 92/E. Genesee St. | 16.4 | B | 14.6 | B | 15.7 | B | 14.1 | B |
| U-41 | Sarah Loguen Dr. at Harrison St. | 14.0 | B | 21.5 | C | 13.8 | B | 43.6 | D |
| U-42 | Elizabeth Blackwell Dr. at Harrison St. | 1.4 | A | 3.1 | A | 1.9 | A | 28.3 | D |
| U-43 | Irving Ave. at Harrison St. | 22.2 | C | 24.5 | C | 26.6 | C | 38.3 | D |
| U-44 | S. Crouse Ave. at Harrison St. | 13.9 | B | 18.3 | B | 14.1 | B | 31.4 | C |
| U-51 | Irving Ave. at E. Adams St. | 11.8 | B | 21.2 | C | 22.1 | C | 20.0 | B |
| U-52 | S. Crouse Ave. at E. Adams St. | 17.9 | B | 10.6 | B | 18.3 | B | 15.8 | B |
| U-56 | Irving Ave. at Waverly Ave. | 17.4 | B | 16.3 | B | 21.6 | C | 29.0 | C |
| U-57 | S. Crouse Ave. at Waverly Ave. | 17.7 | B | 16.6 | B | 14.3 | B | 10.4 | B |
| U-58 | University Ave. at Waverly Ave. | 31.5 | C | 29.5 | C | 26.5 | C | 35.2 | D |
| U-62 | Irving Ave. at University Pl | 17.2 | B | 17.5 | B | 21.1 | C | 23.0 | C |
| U-63 | Irving Ave. at Van Buren St. | 17.0 | B | 13.8 | B | 21.5 | C | 16.2 | B |
| U-65 | Comstock Ave. at Euclid Ave. | 20.3 | C | 20.0 | B | 20.9 | C | 54.2 | D |
| U-67 | Comstock Ave. at Stratford St. | 28.0 | D | 28.7 | D | 44.5 | E | 59.7 | F |
| U-68 | Crouse Ave. at Westbound I-690 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-69 | Crouse Ave. at Eastbound I-690 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-70 | Irving Ave. at Erie Blvd. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-71 | Irving Ave. at Water St. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| W-1 | Southbound I-81 On-Ramp/Genant Dr. at Bear St. | 4.9 | A | 25.4 | C | 14.7 | B | 7.5 | A |
| W-3 | Southbound I-81 Off-Ramp/Genant Dr. at Spencer St. | 39.6 | E | 4.6 | A | 5.1 | A | 9.8 | A |
| W-4 | Solar St. at Hiawatha Blvd. W. | 33.3 | C | 27.1 | C | 20.4 | C | 38.8 | D |
| W-5 | Spencer St. at Hiawatha Blvd. W. | 22.0 | C | 26.9 | C | 23.7 | C | 43.6 | D |
| W-6 | I-690 East Off-Ramp at Hiawatha Blvd. W. | 13.9 | B | 17.7 | B | 15.1 | B | 26.2 | C |
| W-9 | Spencer St. at Bear St./I-690 Ramps | 12.6 | B | 15.4 | B | 13.0 | B | 15.2 | B |
| W-12 | N. Geddes St. at Westbound I-690 Off-Ramp | 15.9 | B | 16.5 | B | 15.4 | B | 17.3 | B |
| W-13 | N. Geddes St. at Edison St. | 6.8 | A | 3.4 | A | 2.8 | A | 2.3 | A |

**Table 5-37**
**2020 and 2050 Viaduct Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| W-15 | N. Geddes St. at NY 5/W. Genesee St. | 27.5 | C | 94.1 | F | 27.9 | C | 86.0 | F |
| W-17 | N. Geddes St. at Wilkinson St. | 3.6 | A | 33.3 | D | 3.5 | A | 50.1 | F |
| W-19 | N./S. Geddes St. at Erie Blvd. W. | 48.8 | D | 63.7 | E | 47.2 | D | 157.0 | F |
| W-20 | S. Geddes St. at W. Fayette St. | 42.9 | D | 51.3 | D | 43.1 | D | 136.9 | F |
| W-21 | S. Geddes St. at Marcellus St. | 26.8 | D | 13.9 | B | 25.6 | D | 87.0 | F |
| W-22 | S. Geddes St. at Otisco St. | 24.3 | C | 12.2 | B | 28.4 | C | 64.7 | E |
| W-23 | S. Geddes St. at Gifford St. | 24.7 | C | 6.1 | A | 29.0 | C | 65.6 | E |
| W-24 | S. Geddes St. at Seymour St. | 15.4 | B | 14.6 | B | 17.0 | B | 47.2 | D |
| W-25 | S. Geddes St. at Grand Ave./Shonnard St. | 23.7 | C | 17.0 | B | 26.5 | C | 40.7 | D |

**Note:** Intersection ID denotes the general location. D = Downtown, U = University Hill, and W = Westside and Lakefront

*Work Zone Safety & Mobility:*

The maintenance and protection of traffic (MPT) and staging concepts developed for the Project and described in Chapter 4 balance the provision of work zone safety with the need to provide mobility for all road users, while maintaining a realistic construction schedule. The staging concepts presented provide the Contractor with sizeable areas for off-line demolition and construction, which in addition to improving the efficiency of the work and reducing both cost and schedule, also provides a considerable separation between motorists and the work zone. This would increase safety for both construction workers and the traveling public. The staging also avoids numerous traffic pattern changes throughout the duration of the Project, particularly for interstate motorists, thereby reducing the impacts associated with traffic pattern adjustments.

NYSDOT has determined that the Project is significant per 23 CFR 630.1010 and therefore, as the project design is developed and refined, a Traffic Management Plan (TMP) will be developed in compliance with 23 CFR 630. 1012. The Traffic Management Plan will address both Traffic Operations (TO) and Public information (PI) strategies for the Project. TO strategies will include identifying and ratifying agreements for all TO elements impacted or related to the Project in both the temporary and permanent condition. TO elements will include maintenance responsibilities, temporary access requirements and agreements, safety patrol and/or vehicle recovery requirements and cost sharing agreements for utility usage. The aim of the TO strategies is to provide a detailed understanding of the role and responsibilities of all parties throughout the duration of the Project. The PI strategies will detail how the project development and construction impacts are communicated to road users and other stakeholders. The PI will identify stakeholders and detail the communication

requirements and methods for each. PI elements will likely include Public Outreach through community events, internet, mailings, radio, and local television.

Building on the MPT and staging strategies presented in Chapter 4, the TMP will include a Temporary Traffic Control (TCC) plan in compliance with Chapter 6 of the Manual of Uniform traffic Control Devices (MUTCD), which will facilitate the reasonably safe and efficient road user flow and highway worker safety.

**Safety Considerations, Accident History and Analysis**

Safety performance measures are required to identify safety problems that may exist in the project area and to evaluate the effectiveness of the build alternatives in addressing these problems. Traditionally, evaluating the safety of a proposed improvement alternative begins with a review of the facility's accident history and applying accident reduction factors from NYSDOT's Post Implementation Evaluation System (PIES). PIES includes factors for capital improvements typically constructed as part of a major highway project and low cost improvements (highway signs, pavement markings, signal timing, etc.) that are usually implemented through minor maintenance activities. However, the proposed build alternatives for the I-81 Viaduct Project would alter roadway geometrics substantially, such that proposed roadway segments would not align with existing roadway segments and associated empirical data.

To address this issue, the FHWA Surrogate Safety Assessment Model (SSAM) was used to develop surrogate safety measures of effectiveness (MOEs), based on vehicle trajectory information from the VISSIM microscopic traffic simulation model. One of the surrogate safety measures is the traffic "conflict", defined as an occurrence when two or more road users would collide if intervening action is not taken. The FHWA document "Surrogate Safety Assessment Model (SSAM) and Validation (FHWA-HRT-08-051, June 2008" asserts that the traffic conflict is a reliable surrogate safety measure of comparative safety, due to its correlation with actual crashes. Therefore, higher rates of traffic conflicts can indicate lower levels of safety.

Vehicle trajectories produced by the VISSIM simulation model were input to SSAM to generate traffic conflicts and associated surrogate safety measures. Safety MOEs for the Viaduct Alternative are compared to the No Build condition for 2050 peak hours in **Table 5-38**. The frequency of rear-end conflicts under the Viaduct Alternative would increase by 15 percent compared to No Build conditions. Speeding and following too closely are common driver behaviors on freeways and are known to precipitate rear-end conflicts. Increased travel on the interstate system under the Viaduct Alternative would contribute to a system-wide increase in rear-end conflicts. Lane changing conflicts would decrease by 23 percent as due to a reduction in the number of interchange on- and off-ramps, the addition of auxiliary lanes, and the lengthening of acceleration/deceleration lanes. Crossing conflicts would decrease by three percent. The total number for all conflict types would decrease by five percent, indicating that a safety benefit in the form of a reduction in the number of accidents could be expected.

**Table 5-38**
**Safety Measures of Effectiveness – No Build and Viaduct (2050)**

| Scenario | No Build | | | Viaduct | | |
|---|---|---|---|---|---|---|
| MOE/Peak | AM | PM | AM+PM | AM | PM | AM+PM |
| Rear End Conflicts | 52,796 | 53,415 | 106,211 | 44,614 | 77,442 | 122,056 |
| Lane Change Conflicts | 72,476 | 73,619 | 146,096 | 44,002 | 69,124 | 113,125 |
| Crossing Conflicts | 121,154 | 156,736 | 277,890 | 102,802 | 167,548 | 270,350 |
| Total Conflicts | 246,426 | 283,770 | 530,196 | 191,418 | 314,113 | 505,531 |

## Construction Traffic Analysis

*Introduction*

In an effort to minimize the total duration of construction and the resulting disturbances associated with its construction, aggressive construction schedules have been established for the I-81 Viaduct Project. For the Viaduct Alternative, six years has been determined to be the minimum construction duration. To achieve this schedule and allow for traffic to be maintained in and through the Project Area, the Project would be constructed in several major phases as follows:

- Phase 1 – Preparatory Phase, focusing on permanent and/or temporary improvements to certain bridges and interchanges, as well as local street improvements
- Phase 2A – I-690 Eastbound Shutdown and Construction
- Phase 2B – I-690 Westbound Shutdown and Construction
- Phase 3 – I-81 Shutdown and Construction

Complete descriptions of all construction phases, and means and methods are presented in **Chapter 4, Transportation Means and Methods**.

Traffic analyses were conducted to assess operating conditions and to identify temporary roadway improvements that would be necessary during construction of the Viaduct Alternative. The intent of the traffic analysis is to verify that adequate traffic operations could be maintained during construction and to identify improvements needed to address congestion during construction. Construction Phase 3, which entails closure of northbound and southbound I-81 between MLK, Jr., East and Butternut Street, for a duration of two years, was studied as the worst-case scenario. Traffic analysis for Phase 2, which involves closing sections of I-690, is discussed under the Community Grid Alternative (which also involves closing I-690 during construction) and traffic conditions are expected to be similar for Phase 2 under each alternative. A detailed Traffic Management Plan including all construction phases will be developed when design advances for the selected alternative.

The SMTC Regional Travel Demand Model was used to identify the change in travel patterns that would occur during construction Phase 3. Traffic volumes were compared to those for the No Build Alternative and volume-to-capacity (v/c) ratios were derived from the model to identify freeway segments and intersections that would experience the greatest potential impact during construction if no temporary improvements were implemented. Impacted freeway segments and potentially impacted intersections were then analyzed.

*Traffic Volumes*

The closure of I-81 and associated ramp connections would result in substantial travel pattern changes due to the diversion of through-trips (i.e. trips currently passing through Syracuse without an origin or destination in Syracuse) to I-481 and the local streets, as well as the diversion of local trips that are redirected to alternative access points due to multiple ramp closures. Five of the proposed eight interstate connector ramp improvements between I-81 and I-690 would also be closed while three connections (i.e., westbound I-690 to northbound I-81, southbound I-81 to eastbound I-690, and eastbound I-690 to southbound I-81) would be open. The West Street interchange would also be fully operational. While the I-81 viaduct is closed, I-81 through traffic from the north would divert to a reopened eastbound I-690 (constructed in Phase 2) and proceed east to I-481. For through traffic originating from the south, the reverse movement would be used.

It should be noted that approximately 12 percent of the total traffic volume currently using I-81 through Downtown Syracuse is attributed to through traffic having both origins and destinations beyond the limits of the two I-81 interchanges with I-481. This through traffic would likely detour to I-481 during Phase 3.

The remaining traffic travelling to or through Downtown would need to exit I-81 either at MLK Jr., East (new ramps constructed during Phase 1) at the southern end or Clinton/Franklin Street at the north end. Local streets could be used for detouring. Heavier usage of north-south arterials is expected due to the displaced I-81 traffic movements during this phase, as well as major east-west streets providing connectivity back to the interstate system. Most of the local streets would have already been improved as part of the city street improvements proposed during Phase 1.

Additional traffic caused by construction activities also was considered. Preliminary construction plans indicate shift times would begin at 7:00 AM and end at 4:00 PM and therefore, the majority of construction worker related traffic would occur outside of the peak traffic hours. However, it is expected that some workers involved in management and clerical activities would travel during the peak hours, and traffic volumes were increased by one percent in the AM and PM peak hours to account for this additional construction-related traffic. In addition, heavy vehicle percentages were adjusted at key intersections to account for additional truck traffic. **Table 5-39** compares 2020 peak hour traffic volumes for the No Build and construction conditions on key roadway segments and indicates substantial traffic volume increases in the following locations:

- I-481
- Clinton Street
- Salina Street
- Renwick Avenue
- Pearl Street
- Franklin Street
- Genesee Street

**Table 5-39**

**2020 No Build and Viaduct Construction Phase 3 Peak Hour Traffic Volumes**

| Location | Direction | AM | | PM | |
|---|---|---|---|---|---|
| | | No Build | Viaduct Construction Phase 3 | No Build | Viaduct Construction Phase 3 |
| I-81 Just North of Colvin Street Interchange | NB | 2,928 | 1,067 | 2,913 | 970 |
| | SB | 2,322 | 730 | 3,457 | 1,739 |
| I-81 Just South of Court/Spencer Street interchange | NB | 2,439 | 2,438 | 5,843 | 5,957 |
| | SB | 5,161 | 3,763 | 3,466 | 1,596 |
| I-481 Just South of I-690 Interchange | NB | 3,424 | 4,444 | 2,739 | 3,962 |
| | SB | 1,995 | 3,028 | 3,501 | 4,691 |
| I-481 Just North of I-690 Interchange | NB | 2,262 | 2,571 | 2,971 | 3,715 |
| | SB | 2,692 | 3,309 | 2,415 | 3,224 |
| I-690 Just West of West Street Interchange | EB | 4,432 | 4,393 | 2,499 | 2,674 |
| | WB | 1,938 | 1,768 | 3,952 | 3,433 |
| I-690 Just East of Teall Avenue Interchange | EB | 3,545 | 2,739 | 4,708 | 3,912 |
| | WB | 3,902 | 3,522 | 3,867 | 2,884 |
| Clinton Street Just North of Genesee Street | SB | 534 | 1,689 | 287 | 1,082 |
| Salina Street Just North of Genesee/James Streets | NB | 203 | 394 | 361 | 743 |
| | SB | 734 | 1,156 | 364 | 679 |
| Almond Street Just South of Harrison Street | NB | 956 | 758 | 1,804 | 925 |
| | SB | 1,538 | 1,269 | 1,174 | 701 |
| Harrison Street Just East of Almond Street | EB | 48 | 40 | 53 | 111 |
| | WB | 825 | 584 | 1,622 | 1,181 |
| Adams Street Just East of Almond Street | EB | 1,705 | 1,466 | 803 | 710 |
| Renwick Avenue Just South of Van Buren Street | NB | 194 | 517 | 126 | 230 |
| | SB | 94 | 243 | 260 | 852 |
| Pearl Street Just North of Willow Street | NB | 106 | 296 | 759 | 1,554 |
| Genesee Street Just East of West Street | EB | 1,095 | 1,394 | 546 | 855 |
| | WB | 327 | 492 | 721 | 1,055 |
| Franklin Street Just North of Genesee Street | NB | 296 | 664 | 619 | 1,073 |
| | SB | 351 | 577 | 238 | 502 |

*Level of Service and Mobility*

*Freeway Level of Service*

AM and PM peak hour LOS analyses were conducted for segments along I-81, I-481, and I-690 within the project area with projected v/c ratios of 0.7 or higher, based on the SMTC regional model because locations with v/c ratios below 0.7 would be expected to operate at

LOS C or better and be uncongested during construction Phase 3. It is expected that traffic on the tie-in ramps where the mainline interstate closures begin and end would increase substantially. The Clinton/Salina Street off-ramp will experience higher traffic volumes, since it will be the last exit before the southbound I-81 mainline closure. During the AM peak hour, the ramp would need to accommodate 2,400 vehicles per hour (vph), exceeding the one lane capacity of 2,000 vehicles per hour currently provided, and operate at LOS F.

Since the Harrison Street on-ramp to northbound I-81 would be closed, traffic from the downtown area to northbound I-81 would divert to Pearl Street and other points of access. At Pearl Street the diversion would cause large increases in traffic volumes compared to baseline conditions. During the PM peak hour, the Pearl Street on-ramp would carry over 2,600 vehicles, exceeding its one-lane capacity of 2,000 vehicles per hour, and operate at LOS F.

The traffic volume and number of lanes with and without proposed improvements are shown in **Table 5-40**. Freeway segment density and LOS are summarized in **Table 5-41**. All freeway segments expected to operate at LOS E or F without temporary improvements would operate acceptably (LOS D or better) with the proposed improvements in place.

In addition, the I-81 shutdown through downtown would divert through traffic onto I-481. The majority of I-481 is currently under-utilized and the three lane sections have adequate surplus capacity to accommodate projected volume increases. The two-lane section of northbound I-481 north of the I-690 interchange would carry over 3,700 vehicles during the PM peak hour under the construction Phase 3 scenario and operate at LOS E. However, the projected density for this freeway segment would be 36.3 pc/mi/ln, which is only slightly above the threshold (35 pc/mi/ln) between LOS D and E, and therefore specific improvements at this location are not proposed.

**Table 5-40**
**2020 Viaduct Alternative Construction Traffic Volume and MPT Plan**

| Segment | Type | Traffic Volume (vph) | | Number of Lanes | |
|---|---|---|---|---|---|
| | | | | Viaduct Alternative | |
| | | AM | PM | without Improvement | with Improvement |
| Northbound I-81 at Pearl Street on-ramp | Merge | 924 | 2,654 | 1 | 2 |
| Southbound I-81 at Clinton/Salina Street off-ramp | Diverge | 2,401 | 1,483 | 1 | 2 |
| Northbound I-481 between Interchange 4 (I-690 East) on-ramp and Exit 5E (Kirkville Road) | BFS | 2,847 | 3,715 | 2 | NA |

**Note:** BFS = basic freeway segment

**Table 5-41**
**2020 Viaduct Alternative Construction Freeway LOS Analysis**

| Segment | Type | AM | | | | PM | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Viaduct Alternative | | | | | | | |
| | | without Improvement | | with Improvement | | without Improvement | | with Improvement | |
| | | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS |
| Northbound I-81 at Pearl Street on-ramp | Merge | 19.1 | C | 9.6 | A | 167.3 | F | 27.5 | D |
| Southbound I-81 at Clinton/Salina Street off-ramp | Diverge | 113.2 | F | 26.3 | D | 31.8 | D | 15.9 | B |
| Northbound I-481 between Interchange 4 (I-690 East) on-ramp and Exit 5E (Kirkville Road) | BFS | 25.6 | C | NA | NA | 36.3 | E | NA | NA |

**Note:** BFS = basic freeway segment

*Intersection Level of Service*

AM and PM peak hour capacity analyses were conducted for 24 intersections expected to experience substantial traffic rerouting during construction Phase 3. Traffic would increase substantially at intersections adjacent to tie-in ramps where the mainline interstate closures begin and end. Clinton and Salina Streets would experience heavy traffic as they connect directly to the last exit before the southbound I-81 mainline closure. Closure of the Harrison Street on-ramp to northbound I-81 would cause traffic from downtown destined to northbound I-81 to divert to Pearl Street and others, largely via State Street. MLK Jr., East and Renwick Avenue would experience heavy traffic as the MLK interchange ramps would provide the first available entrance point to southbound I-81 and the last exit from northbound I-81 south of the mainline shutdown. Peak hour intersection LOS under Phase 3 construction conditions without additional improvements are shown in **Table 5-42**. Intersections expected to operate at LOS E or F are as follows:

- N. Clinton Street at NY 5/W. Genesee Street (AM and PM peak hours)
- N. Salina Street at SB I-81 Off-ramp (AM peak hour)
- Pearl Street at Hickory Street (PM peak hour)
- US 11/N. State Street at James Street (PM peak hour)
- Almond Street at E. Adams Street (AM peak hour)
- MLK, Jr., East at Southbound I-81 On-ramp (PM peak hour)

To address congestion under the construction scenario, several temporary roadway improvements were developed (see **Table 5-43**). In addition, traffic signal modifications would be introduced at intersections along affected corridors to facilitate traffic flow and promote signal coordination. Peak hour LOS for intersections under construction conditions with proposed improvements are shown in **Table 5-44**. With the proposed improvements, all intersections would operate at acceptable levels with the exception of the N. Salina Street intersection at the southbound I-81 off-ramp (D-31). Although this location is projected to operate at LOS E in the AM peak hour, delays would be reduced substantially from 118.7 to 57.3 seconds/vehicle as a result of the proposed temporary traffic signal. In addition, the

projected average vehicle delay of 57.3 is only slightly above the threshold (55 seconds/vehicle) between LOS D and E.

**Table 5-42**

**Intersection LOS During Viaduct Construction Phase 3 without Improvements**

| ID | Name | 2020 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West Street at NY 5/W. Genesee Street | 30.3 | C | 51.3 | D |
| D-10 | Wallace Street at NY 5/W. Genesee Street | 13.8 | B | 14.7 | B |
| D-13 | N. Franklin Street at NY 5/W. Genesee Street | 19.7 | B | 44.8 | D |
| D-21 | N. Clinton Street at NY 5/W. Genesee Street | 121.1 | F | 59.9 | E |
| D-31 | N. Salina Street at SB I-81 off-ramp | 118.7 | F | 7.9 | A |
| D-32 | N. Salina Street at Herald Place | 21.1 | C | 32.0 | C |
| D-33 | N. Salina Street at E./W. Willow Street | 6.5 | A | 8.7 | A |
| D-34 | N. Salina Street at NY 5/W. Genesee Street/James Street | 20.4 | C | 13.1 | B |
| D-46 | Pearl Street at Hickory Street | 20.6 | C | 778.3 | F |
| D-49 | N. Warren Street at NY 5/James Street | 12.2 | B | 14.4 | B |
| D-58 | Oswego Boulevard at James Street | 5.4 | A | 6.7 | A |
| D-70 | US 11/N. State Street at James Street | 33.0 | C | 100.4 | F |
| D-71 | US 11/S. State Street at NY 5/Erie Boulevard E. | 18.8 | B | 41.0 | D |
| D-100 | Almond Street/Catherine Street at NY 5/Erie Boulevard E. | 15.6 | B | 27.0 | C |
| D-101 | Almond Street at E. Water Street | 8.7 | A | 7.8 | A |
| D-102 | Almond Street at E. Washington Street | 7.3 | A | 7.9 | A |
| D-103 | Almond Street at E. Fayette Street | 9.2 | A | 9.5 | A |
| D-104 | Almond Street at NY 92/E. Genesee Street | 49.9 | D | 54.2 | D |
| D-107 | Almond St. at Harrison Street | 17.7 | B | 21.8 | C |
| D-108 | Almond Street at E. Adams Street | 75.0 | E | 22.1 | C |
| D-110 | Almond Street at Van Buren Street | 28.4 | C | 12.6 | B |
| D-123 | Catherine Street at Westbound I-690 off-Ramp | 6.9 | A | 15.3 | B |
| D-125 | MLK Jr. E. at Southbound I-81 on-Ramp | 1.0 | A | 74.4 | E |
| D-126 | MLK Jr. E. at Northbound I-81 off-Ramp | 18.4 | B | 6.0 | A |

**Table 5-43**
**Viaduct Alternative: Local Street Improvements**

| Location | Temporary Mitigation Measures/Improvements | Permanent Mitigation Measures/Improvements |
|---|---|---|
| I-81 Southbound on-ramp from MLK Jr., East | Construct new ramp with a second lane added; lane can be dropped on the ramp before mainline | Provide a single lane on-ramp |
| Intersection of MLK Jr., East and I-81 Southbound on-ramp | Add eastbound right-turn bay (approx. 150') | Provide a single lane for the eastbound approach |
| I-81 Northbound on-ramp from Pearl Street | Add second lane starting from the intersection of Pearl and Hickory Streets; continue both lanes | Provide a two lane on-ramp to Northbound I-81. One lane from Hickory Street and a second is added from the slip lane coming from southbound Pearl Street |
| Intersection of Pearl and Hickory Streets | Install temporary signal; restripe two northbound approach lanes to serve: 1) left turns; and 2) left turns, through traffic and right turns | Restore current configuration |
| Intersection of I-81 Southbound off-ramp and Salina Street | Install temporary signal | Remove Southbound I-81 off-ramp to Salina Street |
| Genesee Street westbound between Franklin and Wallace Streets | Remove parking lane; provide two westbound travel lanes | Restore current configuration |
| Intersection of Genesee and Wallace Streets | Restripe two westbound approach lanes to prohibit westbound left-turns from West Genesee Street onto Wallace Street | Restore current configuration |
| Intersection of Genesee and Franklin Streets | Remove parking (approx. 75') along westbound approach to create an auxiliary through lane; Restripe two westbound approach lanes to serve: 1) left turns and through traffic; and 2) through traffic and right turns | Restore current configuration |
| Intersection of James and State Streets | Add protected eastbound left-turn signal phase | Restore current phasing |

**Table 5-44**
**Intersection LOS During Viaduct Construction with Improvements**

| ID | Intersection Name | 2020 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West Street at NY 5/W. Genesee Street | 30.3 | C | 37.8 | D |
| D-10 | Wallace Street at NY 5/W. Genesee Street | 13.1 | B | 8.5 | A |
| D-13 | N. Franklin Street at NY 5/W. Genesee Street | 19.5 | B | 25.8 | C |
| D-21 | N. Clinton Street at NY 5/W. Genesee Street | 29.5 | C | 21.3 | C |
| D-31 | N. Salina Street at SB I-81 Off-ramp | 57.3 | E | 5.7 | A |
| D-32 | N. Salina Street at Herald Place | 45.0 | D | 27.6 | C |
| D-33 | N. Salina Street at E./W. Willow Street | 5.3 | A | 10.4 | B |
| D-34 | N. Salina Street at NY 5/W. Genesee St./James Streets | 24.4 | C | 15.1 | B |
| D-46 | Pearl Street at Hickory Street | 21.5 | C | 49.9 | D |
| D-49 | N. Warren Street at NY 5/James Street | 13.0 | B | 15.3 | B |
| D-58 | Oswego Boulevard at James Street | 5.4 | A | 8.1 | A |
| D-70 | US 11/N. State Street at James Street | 33.1 | C | 38.0 | D |
| D-71 | US 11/S. State Street at NY 5/Erie Boulevard E. | 18.9 | B | 29.8 | C |
| D-100 | Almond Street/Catherine Street at NY 5/Erie Boulevard E. | 15.9 | B | 26.9 | C |
| D-101 | Almond Street at E. Water Street | 8.7 | A | 7.9 | A |
| D-102 | Almond Street at E. Washington Street | 7.3 | A | 8.1 | A |
| D-103 | Almond Street at E. Fayette Street | 8.4 | A | 11.5 | B |
| D-104 | Almond Street at NY 92/E. Genesee Street | 48.2 | D | 31.0 | C |
| D-107 | Almond Street at Harrison Street | 16.4 | B | 22.8 | C |
| D-108 | Almond Street at E. Adams Street | 38.3 | D | 22.1 | C |
| D-110 | Almond Street at Van Buren Street | 28.4 | C | 12.6 | B |
| D-123 | Catherine Street at Westbound I-690 Off-ramp | 6.9 | A | 15.3 | B |
| D-125 | MLK Jr. E. at Southbound I-81 On-ramp | 0.7 | A | 6.8 | A |
| D-126 | MLK Jr. E. at Northbound I-81 Off-ramp | 18.4 | B | 6.0 | A |

In addition to the Phase 3 improvements discussed above, a comprehensive Traffic Management Plan will be developed for the selected alternative. The Traffic Management Plan would comprise all major construction phases and sub-phases, as well as system-wide measures to efficiently and safely serve the needs of the Project Area; reduce traffic volumes during construction; minimize traffic diversions to local streets and other routes; and ensure compatibility with the social, economic, and land use character of the Project Area. Potential measures to be evaluated may include:

- Implementation of expanded and improved Intelligent Transportation Systems
- Continued refinement of construction staging
- Expanded highway traffic enforcement
- Additional local arterial traffic operations improvements
- Expanded local arterial traffic enforcement
- Pedestrian improvement measures
- Park-and-ride facilities
- Rideshare action plan
- Truck routing measures
- Information telephone hotline
- Media campaign
- Public involvement program
- Signal Retiming
- Planned and Unplanned Traffic Incident Management
- Transportation Demand Management measures (e.g., guaranteed ride home, car sharing, and carpool matching)
- Creating additional bus routes or adding buses to existing routes

**Constructability Review**

An initial constructability review was conducted during preliminary design to evaluate current alternative designs and staging schemes, to identify potential constructability issues and innovative means and methods that may apply, identify additional construction related impacts, identify potential for additional right-of-way impacts and evaluate the overall project schedule to identify strategies that will improve constructability while accelerating the overall construction schedule. As a result of this evaluation, it was determined that the Viaduct Alternative is constructible and there were no major concerns regarding additional right-of-way.

The construction schedule was a major outcome of this evaluation. Multiple construction schedules were identified based on the degree to which traffic could be detoured. To a large extent, it was determined that identifying strategies to reduce the overall project schedule also resulted in improving constructability, but also caused a larger impact to traffic. The most aggressive schedule identified for the Viaduct Alternative was a six-year schedule. As detailed in Chapter 4, a six-year schedule would only be possible through use of longer-term shutdowns of interstate segments. By employing a strategy that takes a section of interstate out of service for an extended period of time, more work can be fully built out in one phase, thus the number of construction stages is dramatically reduced, productivity increases, the overall timeframes are reduced and the constructability improves.

As noted, the constructability evaluation was conducted early in preliminary design. It is anticipated that as design progresses, a formal, independent constructability review will be conducted according to NYSDOT policy. The constructability review will be performed by an Independent Review Team and would be coordinated with a Value Engineering review. A Value Engineering (VE) review is a systematic process designed to focus and improve upon the major elements of complex or high cost projects. The main objectives of a VE review are to make recommendations on how to optimize construction scheduling, performance, constructability, maintainability, environmental awareness, safety, and cost consciousness.

**Impacts on Police, Fire Protection, and Ambulance Access**

The Viaduct Alternative would not have adverse impacts on ambulance access or police and fire protection. Traffic analyses show improved levels of service within the project limits.

Reduced congestion near the I-81 interchange at Harrison and Adams Streets improves mobility through the geographic center of the city. The additional access point to and from I-81 located at East MLK Jr., East and the conversion of Crouse Avenue to two-way operation south of Genesee Street improves access to the major Hospitals on University Hill and provides emergency responders with additional routing options. Increased mobility and reduced travel times within the Project Area would be expected to improve response times during peak hours.

**Parking Regulations and Parking-related Issues**

Once completed, the I-81 Viaduct Project would not further affect parking supply and demand beyond its construction year of 2020. The Project itself, regardless of the alternative, will not change parking supply or demand once it is built (e.g., the Project will not require supply changes nor will it generate parking demand in the future) between 2020 and 2050. Therefore, future parking supply and demand was evaluated for 2020, but not 2050. Information was gathered to estimate parking supply and demand changes by 2020 due to known development projects through internet research and coordination with a number of local agencies and other stakeholders. It is assumed that any future parking demand generated beyond 2020 would not be a result of the I-81 Viaduct Project and will be accommodated as part of any future development processes through zoning requirements and/or market demand.

The effects on parking within the I-81 Viaduct Study area were determined based on the preliminary design for the Viaduct Alternative. If the affected area encompassed a parking facility or building that generates parking demand, it was noted along with the effects on parking supply. It was conservatively assumed, for the purpose of this analysis, that any supply within the affected area, would be lost. For example, it was assumed that all existing parking under the viaduct would be lost and no new parking supply would be included. Any potential reintroduction of parking, post construction, will be addressed as part of mitigation measures.

The anticipated work may affect an entire parcel (building and parking area), the building only, the parking area only, or a portion of the parking on-site. For this analysis, a loss of a

building assumes loss of demand and the loss of a parking facility assumes loss of supply. Based on the preliminary design, approximate estimates (25, 50, 75, or 100 percent loss) were made for parking supply lost or demand affected. New on-street parking supply would be included on reconstructed Almond and West Street and some existing on-street parking would be replaced along Genesee Street. The associated change in supply and demand was applied to the future No Build years' supply and demand to provide the estimated future year supply and demand

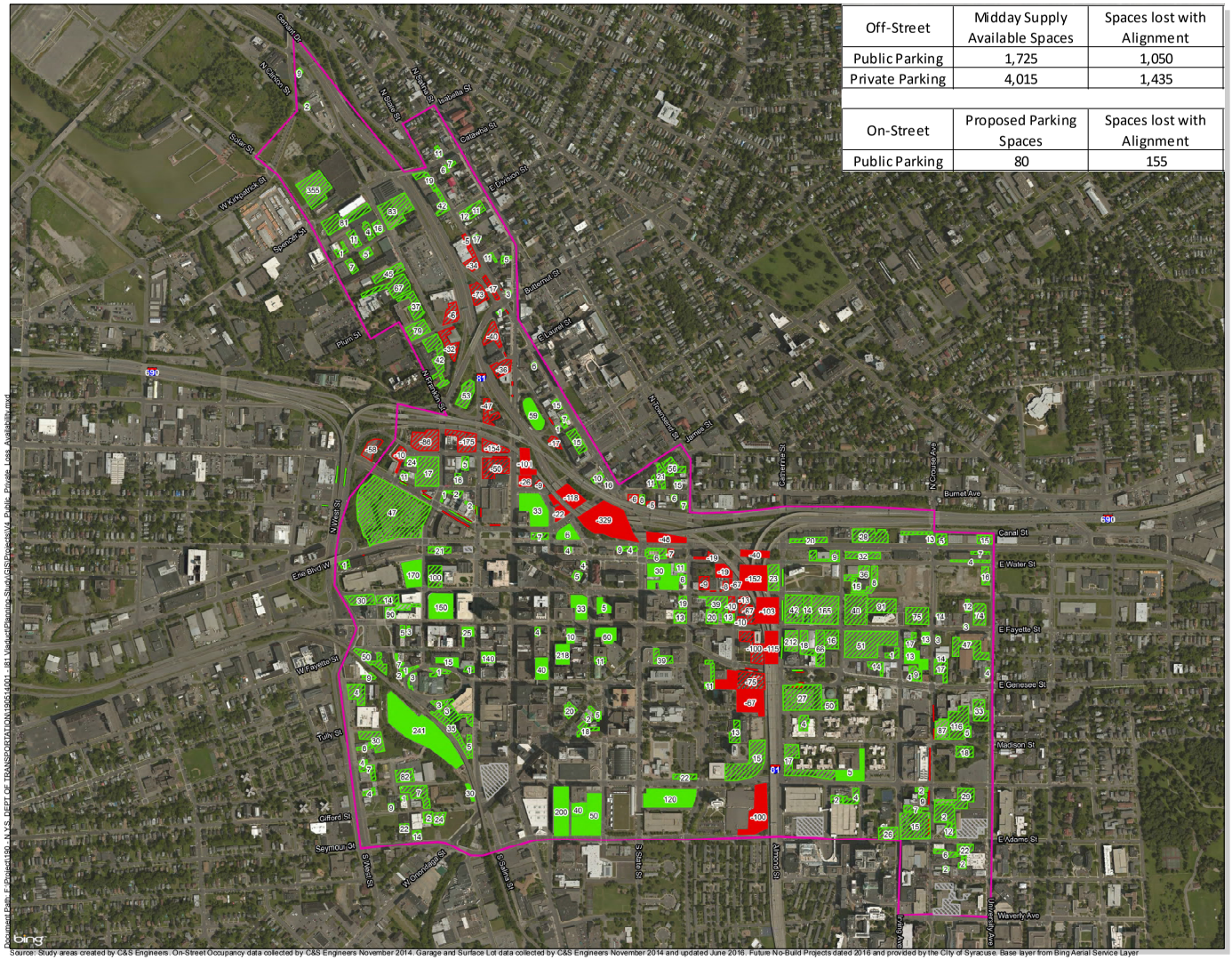
Overall, the loss of supply is estimated to be approximately 2,600 spaces and the reduction in demand would be approximately 500 spaces in 2020. As shown in Table 5-45, parking supply under the Viaduct Alternative in 2020 would be 85 percent utilized, a six percent increase from the No Build Alternative. As noted in Section 5.3, the effective supply is the overall supply reduced for planning purposes to account for user familiarity and potential weather impacts. Since the I-81 Viaduct Project would not affect parking beyond its construction, future parking supply and demand was not evaluated beyond 2020. More detailed information is included in **Appendix C-5**.

**Table 5-45**
**Viaduct Alternative Parking Supply & Demand Summary**

| | Change in Supply | Supply | Effective Supply | Change in Demand | Demand | Utilization |
|---|---|---|---|---|---|---|
| Existing Conditions | - | 29,233 | 26,808 | - | 21,064 | 79% |
| 2020 Future No Build | 2,149 | 31,382 | 28,779 | 1,782 | 22,846 | 79% |
| 2020 Future Build | -2,559 | 28,823 | 26,432 | -490 | 22,356 | 85% |

While the entire study area would have sufficient supply to accommodate demand, the geographic distribution of available parking may not align with the distribution of demand. As shown in **Figure 5-12**, there would be a disproportionate loss of parking along the I-81 alignment. It was assumed that the majority of motorists generally are willing to walk up to ¼ mile from their parking facility to their final destination. Therefore, there is a need to identify or provide available parking within the general vicinity of the parking loss.

The Viaduct Alternative would result in a loss of approximately 1,305 spaces in public off-street parking facilities and 1,180 spaces in private off-street facilities. There also would be a net loss of approximately 70 public on-street spaces. For the purposes of this analysis, public facilities are those where the public can purchase the rights to park regardless of the owner of the facility. A private facility is one on privately held land and is available only to employees or visitors of a specific building or institution. With regard to loss of supply, any parking facility owned by a municipality or public agency is considered public, even if it is only open to employees and not the general public. In terms of available supply, it was assumed that any parking owned by University Hill institutions that are for their employees, patients, or visitors are considered private.




Viaduct Alignment with Affected Parking Areas

Mitigation for parking impacts varies for public versus private facilities. Impacts to private facilities will be mitigated through the real estate process and will comply with the New York State Eminent Domain Procedure Law (Articles 1 through 7).

Potential mitigation measures to address the reduction in public parking supply (1,305 spaces) include a combination of the following:

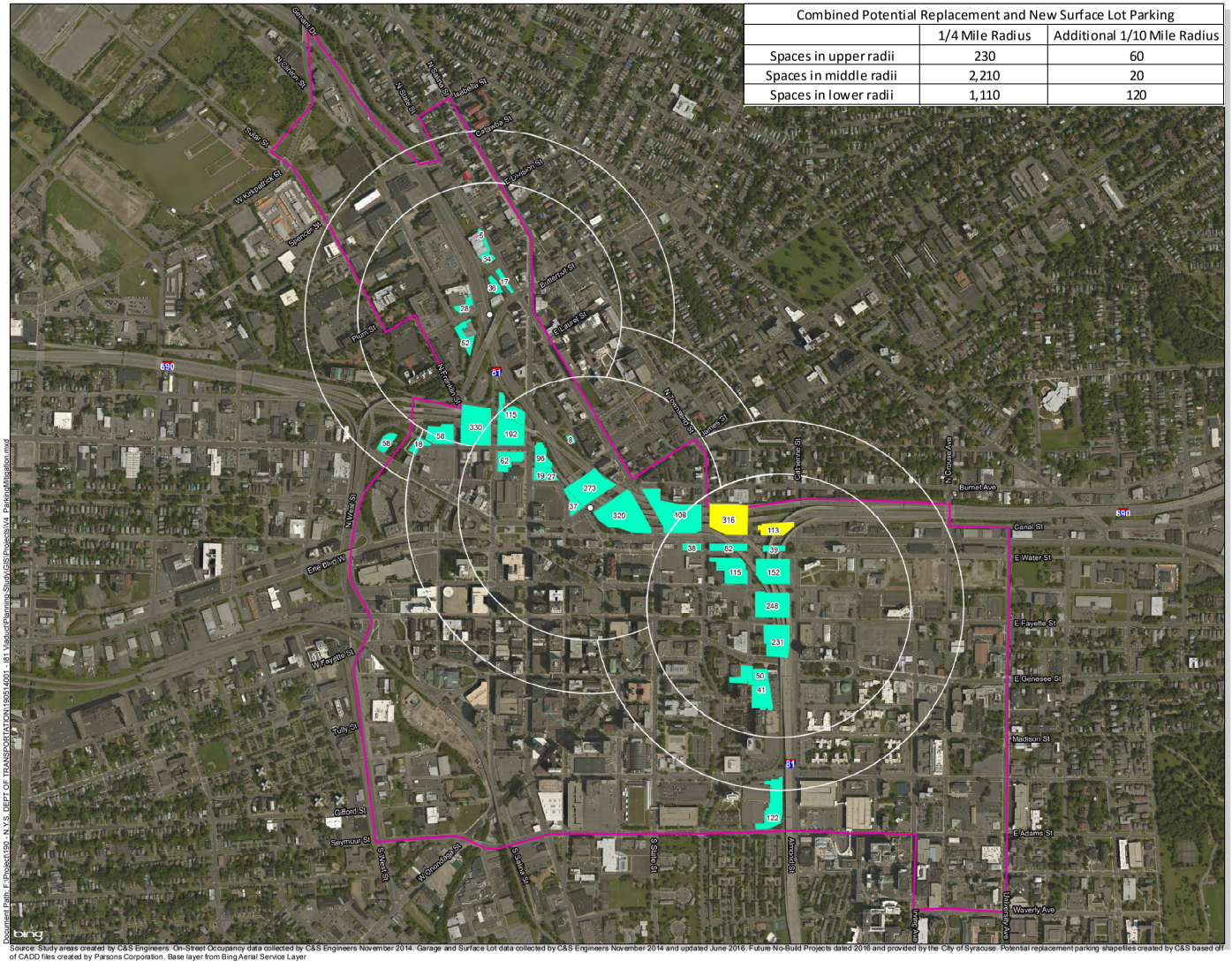
- Implementation of transportation demand management (TDM) measures to reduce the demand for parking (refer to recommendations in the Syracuse Metropolitan Transportation Council Downtown Syracuse TDM Study),
- Maximize the available public parking within the I-81 Viaduct Study Area through promotion of available parking, improving the pedestrian environment and/or provision of shuttle services,
- Replacement of parking supply under I-81 and I-690, and
- Development of new parking supply in the form of surface lots or parking garages.

To identify if parking loss could be mitigated using these measures, estimates were made regarding location and size of the currently available or potential new parking facilities. Surveys of Syracuse employees indicate they typically are willing to walk ¼ mile from where they park to their destination. This provides a reference for considering available existing parking and locations for new or replacement parking to be considered to mitigate losses within a reasonable distance. An additional 0.1 mile beyond the ¼ mile area was also considered to account for the distribution of demand within the ¼ mile radius and potential spaces that could be used as mitigation if infrastructure improvements were available to encourage users to park farther away from where they park now.

- **Figures 5-12 and 5-13** show the parking losses divided into three geographic areas (upper, middle, and lower) along with potential mitigation options. **Table 5-46** summarizes the potential to mitigate the parking loss through:
- the use of existing available public parking supply (1,025 spaces),
- potential replacement of parking below I-81 and I-690 (3,320 spaces), and
- the development of new surface parking lots (430 spaces).

**Table 5-46**
**Viaduct Alternative Mitigation**

| Area (1/4 mile radii + additional 0.1 mile) | Loss of Public Spaces | Available Public Spaces (Figure 5-12) | Potential Replacement Spaces (Figure 5-13) | New Potential Surface Lots (Figure 5-13) | Total Possible Mitigation Spaces |
|---|---|---|---|---|---|
| Upper | 0 | 0 | 290 | 0 | 290 |
| Middle | 595 | 965 | 1,915 | 315 | 3,195 |
| Lower | 710 | 60 | 1,115 | 115 | 1,290 |
| Total | **1,305** | 1,025 | 3,320 | 430 | **4,775** |




Potential Replacement Parking—Viaduct Alternative

**I-81 Viaduct Project**

**Figure 5-13**

The potential mitigation measures could provide a total of 4,775 spaces, which is more than needed to address the loss of 1,305 spaces. Moreover, parking loss could be mitigated in each of the three geographic areas. The potential mitigation measures identified provide flexibility in the final selection of a combination of mitigation measures to be further defined through coordination with the City of Syracuse, NYSDOT, and other agencies and entities.

### Lighting

Under the Viaduct Alternative, all existing highway lighting within the I-81 Viaduct Study Area would need to be replaced. This would include lighting on I-81, from south of the Martin Luther King East Bridge to the vicinity of Bear Street. It is anticipated that the existing high mast lighting in the vicinity of Hiawatha Boulevard would remain. Similarly, the existing highway lighting along I-690, between Leavenworth Avenue and Lodi Street, would be replaced.

In addition to highway lighting, it is expected that replacement lighting would be provided on reconstructed city streets, as well as under bridge lighting, sidewalk and shared-use (bicycle and pedestrian) paths lighting, and gateway and special area lighting. Lighting on controlled access facilities and local streets are consistent with lighting warrants in Chapter 12 of the Highway Design Manual and NYSDOT's "Policy of Highway Lighting". Local lighting upgrades will require that the City of Syracuse consents to assume operational and maintenance costs for all future lighting installations. This agreement shall be confirmed when design advances.

Roadway lighting is constantly changing due to changes in technology and other factors that are associated with outdoor lighting. Some of the issues to be considered include lighting pollution that is created by glare, light trespass, and urban sky glow. Lighting glare causes reduced visual performance, which reduces the ability of the driver to distinguish objects clearly. Lighting options considered should be of low vertical illuminance and increasing the mounting height and the spacing between poles.

Light trespass and urban sky glow is allowing roadway lighting to illuminate the areas along a roadway with the light that is around the light pole. This may illuminate residential areas and affect the performance of security cameras in commercial areas. Fixtures in these areas should consider cut-off technology or shields to minimize the amount of light trespass and sky glow. Energy consumption is another consideration. The cost of energy consumption is a real cost to the owner of the light fixtures, and with improvements in technology, coupled with reduced maintenance costs due to a long life expectancy, LED street light fixtures are proving to be a viable option that could be considered as an option.

Replacement highway lighting, for I-81 and I-690, would be designed based on IES RP-9 recommended values for Freeway A, Type R3 Pavement, as summarized in **Table 5-47.**

**Table 5-47**
**Viaduct Alternative—Recommended Lighting Values: Luminance**

| Item | IES Recommended Value | Calculated Value (1) |
|---|---|---|
| Avg. Illuminance (cd/m2) | ≥0.6 | 0.6 |
| Uniformity (Avg./Min Ratio) | ≤3.5 | 1.6 |
| Uniformity (Max/Min Ratio) | ≤6.0 | 3.8 |
| Veiling Luminance Ratio | ≤0.3 | 0.3 |
| Small Target Visibility | 3.2 | 2.4 |

**Notes:**
The calculated values were determined using the aid of Visual Lighting Software's Roadway tool. For the purposes of this analysis, the fixture was assumed to be a Lithonia, type DSX1 60LED with 700mA driver, Type 5 distribution at 4000°K. The calculations were performed using one side of the Freeway, with 4 lanes @12' per lane with a 10' median, type R3 pavement, with a fixture height of 30'. The optimal spacing of the fixture in order to achieve the IES recommended values, which are shown on the table above, was calculated to be 240' spacing per side, with fixtures staggered at 120'.

In addition to highway lighting, it is expected that replacement lighting would be provided on city streets that are reconstructed, as well as under bridge lighting, sidewalk and shared-use (bicycle and pedestrian) paths lighting, gateway and special area lighting. Design criteria for additional lighting classifications are summarized in Table 5-48.

Replacement lighting for city streets, sidewalks, shared-use (bicycle and pedestrian) paths and special use lighting under this alternative would be subject to approval by the City of Syracuse and may require modification or establishment of special lighting districts. Special Lighting Districts are those areas in the City that have petitioned the Common Council to allow for street lighting different than standard lighting, and may typically be identified by decorative features or underground wiring. With the benefit of this special lighting come additional costs that are placed on the tax bills of the property owners within these districts. Even replacement of existing luminaires with LED luminaires would need to be

**Table 5-48**
**IES Recommended Horizontal Illumination of Roadways and Walkways**

| seeing task | Classification of Area | |
|---|---|---|
| **Vehicular Roadways** | **Commercial** | **Residential** |
| Local Roadway/City Street | 0.9 FC | 0.4 FC |
| **Pedestrian Walkways/Shared-use** | | |
| Sidewalks | 0.9 FC | 0.2 FC |

approved through a special lighting district. Any modifications other than standard High Pressure Sodium luminaires on utility poles, would require a public vote for the City to accept it. On a typical highway project, the state would pay the cost of installing replacement light fixtures, and the cost for maintenance would either be by National Grid through a tariff rate or the City of Syracuse would be responsible for maintenance.

### Ownership and Maintenance Jurisdiction

Under the Viaduct Alternative, NYSDOT would continue ownership and maintenance responsibilities for the Interstate highway system. In addition, NYSDOT would retain ownership of the arterials listed in **Table 5-20** and would continue to contract with the City of Syracuse for the maintenance of these facilities. The ownership and maintenance responsibilities for all other local roads would remain the same under this alternative.

A maintenance agreement with the City of Syracuse would be necessary to facilitate energizing and maintenance of any new lighting constructed along city streets as well as the state-owned lighting along I-81 and I-690.

## MULTIMODAL

### Pedestrians

Pedestrians will continue to be prohibited on I-690, I-81, and I-481 by state law.

Pedestrian facilities would be reconstructed along all city streets that are impacted by this alternative and would be designed consistent with New York State Complete Streets legislation, and to meet current ADA and NYSDOT standards. In accordance with the project objectives, the Viaduct Alternative would result in improved pedestrian accommodation, connectivity, and safety, and the existing deficiencies identified in **Section 5.3** would be addressed. Pedestrian facilities would be provided on both sides of Almond Street from Erie Boulevard to Van Buren Street, thereby eliminating the existing gaps that would remain under the No Build Alternative. Pedestrian connectivity between Downtown and University Hill neighborhoods would be improved by providing crosswalks for all pedestrian movements at the Harrison Street intersection. Where crosswalks pass through raised median areas below the interstate viaduct at Genesee, Harrison, and Adams streets, Americans with Disabilities Act compliant pedestrian refuge areas will be provided with protective bollards. Between Fayette Street and Water Street, bump outs will be provided to narrow east-west pedestrian crossings of Almond Street. At the Almond Street intersections with Jackson Street, Taylor Street, Burt Street, and Van Buren Street crosswalks will be provided to facilitate pedestrian east-west connectivity below the interstate viaduct. Between Erie Boulevard and Burnet Avenue, pedestrian facilities would be provided on the west side of the street only so as to avoid conflicts with the EB I-690 and WB I-690 ramps.

In addition, the travel lane widths within the segment of Renwick Avenue, between Martin Luther King East and Van Buren Street, would be reduced slightly to allow the sidewalk on the east side of the street to be replaced, along with a buffer strip, to help improve pedestrian accommodation and safety and to improve the connection between the Southside and University Hill.

The removal of the overpass at West Street and Genesee Street would allow for several pedestrian enhancements in the area. A sidewalk would be provided on the east side of West Street between Genesee Street and Erie Boulevard where none currently exists or would exist under the No Build Alternative. A sidewalk would be provided on the north side of Genesee Street between Plum Street and West Street. Crosswalks at West and Genesee Street would utilize medians to provide protected pedestrian refuges.

A new shared-use (bicycle and pedestrian) path would be provided on the west side of Onondaga Creek where none currently exists or would exist under the No Build Alternative. The new shared-use (bicycle and pedestrian) path would provide connectivity to destinations north and south of the Project Area via new connections to the Onondaga Creekwalk. Americans with Disabilities Act compliant curb ramps and crosswalks and pedestrian signals with push buttons and sidewalks would be provided throughout the project limits. These facilities would improve pedestrian safety and enhance pedestrian connections in the local street network within the Project Area and improve connectivity between the Park Avenue neighborhood, the Downtown business district, and other key destinations.

**Bicyclists**

Bicyclists will continue to be prohibited on I-690, I-81, and I-481 by state law.

The *Syracuse Bike Plan*, a section of the *Syracuse Comprehensive Plan 2040,* lays out a detailed vision for an interconnected bike network throughout the city. This Project builds on the city's vision of a bike network that provides connectivity between neighborhoods, the Downtown business district, and other key destinations. Facilities would be developed consistent with *AASHTO Guide for the Development of Bicycle Facilities 2012 Fourth Edition* and New York State Complete Streets legislation.

The Viaduct Alternative would result in improved bicycle accommodation, connectivity, and safety. A new dedicated bicycle facility would be provided on Almond Street between the Erie Canalway Trail on Water Street and Van Buren Street where none currently exists or would exist under the No Build Alternative. From the Erie Canalway Trail on Water Street to Adams Street, a one-way raised cycle track would be provided on both sides of Almond Street. From Adams Street to Fineview Place, a two-way shared-use (bicycle and pedestrian) path would be provided on the west side of Almond Street, and extended to Raynor Avenue via shared lane markings on Fineview Place. A two-way raised cycle track would be provided on the west side of Salina Street between Laurel Street and Herald Place. Bike lanes would be provided on McBride Street between Burnet Avenue and the Erie Canalway Trail on Water Street, Bike lanes would be provided on Lodi Street between Burnet Avenue and Canal Street, and connected to the Erie Canalway Trail on Water Street via shared lane markings on Canal and Walnut streets. Bike lanes would be provided on the new Butternut Street Bridge that would connect to proposed facilities on Salina and State streets to the east, and to Franklin Street to the west. The new Butternut Street bike lanes would connect to a new shared lane facility on Franklin and Evans streets, and to a new shared-use (bicycle and pedestrian) path on the west side of Onondaga Creek. Additionally, a new shared-use (bicycle and pedestrian) path segment would be provided to connect the existing Onondaga Creekwalk to the bike facilities accessible at the intersection of Franklin Street and Evans

Street. The new Spencer Street Bridge would include bike lanes that would extend east to Salina Street via Catawba, and west to Clinton Street with new bike lanes. These new facilities would enhance bicycle connections in the local street network within the Project Area and improve connectivity between neighborhoods, the Downtown business district and other key destinations. Refer to **Chapter 3: Description of Alternatives**, for additional description of proposed bicycle facilities.

**Transit**

No changes in bus service are proposed under the Viaduct Alternative. However, potential minor impacts on existing operations are projected due to the proposed modifications of the following freeway and arterial roadways:

- At I-81 Interchange 18, access from the northbound I-81 entrance-ramp from Harrison Street to eastbound I-690 would not possible
- New on-ramp at Almond Street to eastbound I-690 would replace existing Harrison Street and McBride Street on-ramps
- Provision of missing I-81/I-690 connections
- Existing Pearl Street and Butternut Street on-ramps would be replaced with a single on-ramp at Pearl Street
- Realignment of Butternut Street bridge
- Existing Franklin Street/West Street and Clinton Street/Salina Street off-ramps would be replaced with a single off-ramp at Clinton Street
- I-690 Interchange 11 (West Street) and removal of the West Street Overpass
- I-690 Interchange 13 (westbound exit-ramp would be relocated from Townsend Street to Almond Street)

These roadway modifications under the Viaduct Alternative may require rerouting of buses for portions of their existing bus service routes. This may subsequently affect bus stop locations and possibly schedules. Based on the Centro route guide, potential bus routes affected include:

- Route 22 James Street – Route 298
- Route 46 Liverpool – Route 57 – Great Northern Mall
- Route 48 Liverpool – Morgan Road – Avon Parkway – Grampian Road
- Route 50 Destiny USA via I-81
- Route 82 Baldwinsville
- Route 84 Mattydale
- Route 86 Henry Clay Boulevard
- Route 88 North Syracuse
- Route 148 Liverpool – Morgan Road
- Route 162 Manlius via I-690 – Widewaters Parkway

- Route 184 Mattydale – Allen Road
- Route 186 Henry Clay Boulevard – Wetzel Road
- Route 188 North Syracuse - Cicero
- Route 246 Oswego – Syracuse via Fulton/Phoenix
- Route 248 Liverpool – Morgan Road
- Route 286 Henry Clay Boulevard – Wetzel Road
- Route 288 North Syracuse – Cicero – Central Square
- Route 362 DeWitt – Widewaters Parkway
- Route 323x James Street – East Syracuse – Minoa Express
- Route 388 Central Square
- Route 550 Destiny USA

Although many bus routes potentially would be affected by the implementation of Viaduct Alternative, the impacted portions of the existing bus routes would not be long (compared with the entire length of the routes) and, therefore, the expected delays, detours, and bus stop relocation should be minimal.

**Airports, Railroad Stations, and Ports**

No changes are proposed; no conflicts are expected.

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

No changes are proposed that would preclude access to any recreation area, and no conflicts are expected.

At Almond Street and West Genesee Street, pedestrian access to Forman Park would be improved via the removal of an existing east bound to west bound vehicular turn lane for Genesee Street. Forman Park, Wilson Park, the Connective Corridor, and the Erie Canalway Trail will be more accessible for bicycle users with the addition of new bicycle infrastructure on Almond Street.

The project changes at West Street and Genesee Street will expand access for pedestrian and bicyclists to the Onondaga Creekwalk via new sidewalks and shared-use (bicycle and pedestrian) path segments.

The bicycle facility at Lodi Street will improve accessibility to Ormand Spencer Park.

## INFRASTRUCTURE

**Proposed Highway Section**

Refer to **Appendix A-1** for proposed typical sections.

*Right-of-way*

**Section 6.3.1, Land Acquisition, Displacement, and Relocation** identifies the property needs for each project alternative.

*Curb*

Within the project construction limits, the majority of I-81 and I-690 non-bridge sections, including the ramps, would include a mountable curb (Type PT100). The mountable curb would be placed at the outside edge of shoulder to help reduce the amount of untreated storm water by directing runoff to the new closed drainage system. Curbing would not be provided at the southern and northern ends of I-81, where adequate right-of-way exists for open ditches and swales. In addition, six-inch-high non-mountable curbing would be provided along both sides of city streets within limits of reconstruction and existing curbing would be preserved in sections programed for mill and inlay treatment. Refer to typical sections in **Appendix A-1** for more specific detail of curbing types and limits.

*Grades*

All segments of I-81 and I-690 within the project limits, and their associated ramps, would meet the maximum grade criteria listed in **Table 5-25.** In addition, the proposed grades for reconstructed local streets would meet maximum grade criteria, except for the existing grade of Van Buren Street, which will be retained. Refer to **Appendix A-1** for profiles of all reconstructed sections of highway and local streets.

*Intersection Geometry and Conditions*

Under the Viaduct Alternative, a large number of intersections would be reconstructed to meet geometric standards, address traffic operational needs, and pedestrian and bicycle accommodation. Some of the more substantial intersection work would include:

- West Street/W. Genesee Street – Currently, this grade-separated crossing provides no direct connection between West Street and Genesee Street. The eastbound I-690 exit ramp connects to both West Street and Genesee Street. The West Street overpass would be removed as part of the Viaduct Alternative and replaced with an at-grade signalized intersection. The new intersection would provide for all traffic movements and enhance pedestrian and bicycle accommodation.
- Martin Luther King Jr. East/Southbound I-81 entrance ramps – A new, signalized intersection would be created at the southbound I-81 entrance ramp. The addition of a new ramp intersection at this location would necessitate closure of the driveway on the north side of Martin Luther King East, which provides access to a parking lot on the east side of the Dr. King Elementary School. The existing parking lot's access to the north, onto Raynor Avenue, would not be affected.
- Martin Luther King Jr., East/Renwick Avenue/Northbound I-81 exit ramp - A new northbound I-81 exit ramp would terminate at the existing junction of Martin Luther King East and Renwick Avenue. A new signalized intersection would be created to accommodate the new ramp, as well as to improve pedestrian and bicycle accommodation.
- Renwick Avenue/Fineview Place – The existing un-signalized intersection at Renwick Avenue/Fineview Place would be reconstructed to improve intersection geometrics, improve traffic operations, increase the separation from the adjacent Van Buren Street intersection, help calm traffic, and improve pedestrian and bicycle accommodation.

- Renwick Avenue/Van Buren Street – This un-signalized intersection would be replaced with a signalized intersection. In addition, the intersection geometrics would be improved to increase the separation from the adjacent Fineview Place intersection, help calm traffic, and improve pedestrian and bicycle accommodation.
- Van Buren Street/Irving Avenue – This signalized intersection would be modified slightly to accommodate separate turn lanes at the intersection. The intersection modifications would primarily involve repaving, restriping, and replacement of the signals and signing. In addition, sidewalk ramps would be reconstructed as needed to meet current standards, and deteriorated sections of curbing and sidewalk would be replaced
- Almond Street/Catherine Street Corridor, Burt Street to Burnet Avenue – All intersections along the Almond Street/Catherine Street corridor would be reconstructed. The intersections would be designed to accommodate traffic operational needs and improve pedestrian and bicycle accommodation. All signals and traffic control systems would be replaced.
- Crouse Avenue, Adams Street to E. Genesee Street - This section of Crouse Avenue would be converted from a one-way to a two-way street. The intersection modifications would primarily involve repaving, restriping, and replacement of the signals and signing. In addition, sidewalk ramps would be reconstructed as needed to meet current standards, and deteriorated sections of curbing and sidewalk would be replaced.
- Butternut Street, Spencer Street, Court Street, and Bear Street – Due to the widening and reconstruction of the northern section of I-81, the various crossing street bridges would be replaced, and the adjoining intersections on both sides of I-81 would be modified or reconstructed as necessary. All impacted intersections would be modified to meet geometric requirements, accommodate traffic operational needs, and enhance pedestrian and bicycle accommodation.

The full extent of intersection work under the Viaduct Alternative is shown on the plans in **Appendix A-1.**

*Roadside Elements*

- Where appropriate, snow storage areas would be provided adjacent to the curbs on all reconstructed streets.
- A shared-use (bicycle and pedestrian) path would be provided along the west side of Almond Street between Fineview Place and Erie Boulevard. A network of shared-use (bicycle and pedestrian) paths would be constructed in the West Street area to enhance connectivity to the existing Creekwalk.
- With few exceptions, minimum five-foot-wide sidewalks would be constructed along both sides of all reconstructed city streets and all sidewalk ramps would be upgraded to meet current ADA standards.
- Driveways would be modified to comply with City of Syracuse standards and current NYSDOT "Policy and Standards for Design of Entrances to State Highways."

- Clear Zone - The design clear zones shown in **Table 5-49** were established in accordance with the NYSDOT HDM and the AASHTO Roadside Design Guide. Clear zones would be further evaluated when design advances to adjust for slopes, roadway curvature, etc. Where fixed objects and other hazards within the clear zone cannot be removed, roadside appurtenances, such as guide rail, would be considered.

**Table 5-49**
**Roadside Elements – Clear Zone**

| Route Name | Design Speed | Clear Zone[1] |
|---|---|---|
| I-81, I-481 south interchange to I-481 north interchange. | 60 mph | 30 ft. |
| I-690, Leavenworth Ave to Lodi St. | 60 mph | 30 ft. |
| Ramps (45-50) | 45-50 mph | 26 ft. |
| Ramps (40) | 40 mph | 17 ft. |
| City Streets | 35 mph | Note 2 |

**Notes:**
1. Clear zone values taken from Table 10-1 from the NYSDOT Highway Design Manual are un-adjusted. When design advances, adjusted clear zone will be determined from adjustments made from minimum curvature and Table 10-2 from the NYSDOT Highway Design Manual.
2. Suggested minimum clear zone is 1.5 ft. and 3.0 ft. at intersections.

## Special Geometric Design Elements

*Nonstandard Features*

During the alternatives development phase, efforts were made to ensure that the design complied with the geometric features and cross sectional elements set forth in, **Section 5.4**. In addition, existing roadside design features within the project corridor were analyzed against these criteria to identify existing features that did not meet the current design standards. For any feature that does not meet the criteria, a completed Non-Standard Feature Justification Form is required. For the Viaduct Alternative, a total of 12 non-standard geometric features are recommended to be retained. This includes five non-standard features on the interstate mainline segments of the Project, one interstate ramp location and an additional six non-standard features are recommended to be retained for local streets within the Project Area. See **Table 5-50** for summary of the geometric Non-Standard Features recommended to be retained and refer to **Appendix A-3** for a copy of the non-standard Feature Justification forms for each of these design elements. In addition, there are eight non-standard Control of Access locations that are recommended to be retained. See **Table 5-31** for a listing of the Control of Access locations and refer to **Appendix A-3** for a copy of the Non-Standard Feature Justification forms for each of these locations.

**Table 5-50**
**Non-Standard Features Recommended to be Retained – Viaduct Alternative**

| Location | Design Element [1] | Design Criteria [2] | Proposed Design Standard [3] |
|---|---|---|---|
| Northbound I-81 – Horizontal Curve #1 | HSSD | 570 ft. | 438 ft. |
| Northbound I-81 – Horizontal Curve #2 | HSSD | 570 ft. | 495 ft. |
| Southbound I-81 – Horizontal Curve #3 | HSSD | 570 ft. | 507 ft. |
| Southbound I-81 – Horizontal Curve #4 | HSSD | 570 ft. | 426 ft. |
| Eastbound I-690 – Horizontal Curve #6 | HSSD | 570 ft. | 509 ft. |
| Interstate Ramp – Eastbound I-690 to Northbound I-81 | HSD | 305 ft. | 268 ft. |
| Butternut Street, at State Street intersection | HSD | 200 ft | 132 ft |
| Van Buren Street, Almond Street to Henry Street | Grade | 8% max. | 15.52% |
| Almond Street-Van Buren Street | Horizontal Curve | 371 ft. | 160 ft. |
| Fineview Place | Horizontal Curve | 250 ft. | 40 ft. |
| Renwick Avenue | HSD | 250 ft. | 116 ft. |
| Renwick Avenue | HSSD | 250 ft. | 190 ft. |

**Notes:**
1) HSSD = Horizontal Stopping Sight Distance, HSD= Headlight Sight Distance
2) Refer to Design Criteria Tables in Section 5.3.
3) Refer to **Appendix A-3** for Non-Standard Feature Justification Forms

*Non-Conforming Features*

In addition to the critical design elements depicted in Chapter 2 of the NYSDOT HDM, many other design features were taken into consideration during the development of the Viaduct Alternative following normally accepted engineering policies. Due to the confined right-of-way, location of some buildings, and limited distance between adjacent intersections, some design elements were adjusted to develop an alternative that met the Project's purpose and need while avoiding undesirable impacts. Refer to **Table 5-51** for a listing of non-conforming design elements, followed by a justification of the retention of each non-conforming feature.

**Table 5-51**
**Non-Conforming Features Recommended to be Retained [(1)] – Viaduct Alternative**

| Location | Design Element | Recommended Design Standard [(2)] | Proposed Design Standard | Justification |
|---|---|---|---|---|
| SB I-81, STA 144+77 to 151+34 | Broken Back Curve | 1500 ft. | 657 ft. | 1 |
| NB I-81, STA 144+85 to 151+41 | Broken Back Curve | 1500 ft. | 656 ft. | 2 |
| WB I-690, STA 69+84 to STA 74+17 | Broken Back Curve | 1500 ft. | 433 ft. | 3 |
| EB I-690, STA 71+57 to STA 75+27 | Broken Back Curve | 1500 ft. | 370 ft. | 4 |
| Ramp - SB I-81 to WB I-690, STA 14+91 TO STA 18+53 | Broken Back Curve | 1500 ft. | 362 ft. | 5 |
| Ramp – WB I-690 to NB I-81, STA 102+98 TO STA 105+40 | Broken Back Curve | 1500 ft. | 242 ft. | 6 |
| Ramp – EB I-690 to NB I-81, STA 3+75 | Compound Curve Ratio | 1:2 Ratio | 1:3.3 Ratio | 7 |
| SB I-81, Bear St. on-ramp to Spencer St. off-ramp. | Ramp Spacing | 1600 ft. | 1000 ft. | 8 |
| NB I-81, Court St. on-ramp to Hiawatha Blvd. off-ramp. | Ramp Spacing | 1600 ft. | 1544 ft. | 9 |
| NB I-81, EB I-690 on-ramp to Court St. off-ramp. | Ramp Spacing | 2000 ft. | 1540 ft. | 10 |
| NB I-81, Pearl St. on-ramp to WB I-690 on-ramp. | Ramp Spacing | 1000 ft. | 378 ft. | 11 |
| NB I-81, Harrison St. on-ramp to 690WB off-ramp. | Ramp Spacing | 2000 ft. | 1882 ft. | 12 |
| NB I-81, Colvin St. on-ramp to MLK East off-ramp. | Ramp Spacing | 1600 ft. | 1150 ft. | 13 |
| SB I-81, WB I-690 off-ramp to Clinton St. off-ramp. | Ramp Spacing | 1000 ft. | 200 ft. | 14 |
| WB I-690, West St. on-ramp to Geddes St. off-ramp. | Ramp Spacing | 1600 ft. | 1378 ft. | 15 |
| EB I-690, West St. off-ramp to NB I-81 off-ramp. | Ramp Spacing | 1000 ft. | 778 ft. | 16 |

**Notes:**
1) When design advances, further refinements would attempt to further improve this feature.
2) Refer to Design Criteria Tables in Section 5.3.

Justification for retaining Non-Conforming Feature:

1. This broken back curve is in an area bounded by Destiny USA and Lodi Street. To avoid Right-of-Way (ROW) impacts on either side, a short tangent section is necessary. This is an existing broken back curve that is being maintained.

2.. This broken back curve is in an area bounded by Destiny USA and Lodi Street. To avoid ROW impacts on either side, a short tangent section is necessary. This is an existing broken back curve that is being maintained.

3. This broken back curve was necessary to avoid ROW impacts on either side of I-690. It is important to note that this broken back curve would be seldom noticeable to the driver as the following curve is flat enough to not require superelevation.

4. This broken back curve was necessary to avoid ROW impacts on either side of I-690. It is important to note that this broken back curve would be seldom noticeable to the driver as the preceding curve is flat enough to not require superelevation.

5. This broken back curve was necessary to achieve the vertical clearance over the westbound I-690 exit ramp to West Street while reducing ROW impacts.

6. This broken back curve was necessary to align the ramp such that vertical clearance was achieved under the eastbound I-690 to northbound I-81 ramp.

7. This broken back curve is located in an area where the exit ramp from eastbound I-690 begins to split to proceed to either northbound or southbound I-81. The recommended non-conforming tangent is necessary to meet ramp spacing criteria, balance the geometry of both movements on the ramp and the need to reduce ROW impacts.

8. This weaving segment is an existing condition that would be improved as a result of adding a fourth mainline travel lane and an additional auxiliary lane for the weaving maneuvers. Maintaining this weaving condition with improvements would prevent the closure of Genant Drive from Bear Street to Spencer Street and the relocation of driveway access to Clinton Street. This would also prevent the rerouting of traffic onto North Clinton Street that would result in addition ROW impacts.

9. This weaving segment is an existing condition that would be improved as a result of adding a fourth mainline travel lane. It is worth noting that the proposed spacing reflects 96 percent of the criteria.

10. This weaving segment is created by the inclusion of the missing connector from eastbound I-690 to northbound I-81. The proposed spacing reflects 77 percent of the recommended spacing. To achieve acceptable operations at this weaving segment, an additional exit lane was added to the Court St. off-ramp to reduce the amount of weaving maneuvers.

11. This spacing represents two consecutive entrance ramps. This spacing was necessary to maintain connectivity from these ramps. The existing spacing is almost nonexistent as the two ramps join northbound I-81 at about the same point. The proposed spacing is a substantial improvement while providing a sufficient acceleration lane for the Pearl Street on-ramp that currently is too short.

12. The minor reduction in spacing for this weaving segment is a result of the proposed location of the northbound I-81 to westbound I-690 off-ramp. Increasing this ramp spacing would result in this ramp not achieving vertical clearance as it crosses over

northbound I-81. The proposed spacing reflects 94 percent of the recommended spacing.

13. This reduced weaving segment is a result of introducing a northbound I-81 exit ramp to Martin Luther King East. To achieve acceptable operations at this weaving segment, an additional exit lane was added to the northbound I-81off-ramp to reduce the amount of weaving maneuvers.
14. This spacing is an existing condition created by the two consecutive exits to North Franklin Street and North Clinton Street Under this alternative, the North Franklin Street off-ramp would be removed. The new southbound I-81 to westbound I-690 ramp would be placed in about the same location. The non-conforming ramp spacing would remain. Properly spaced overhead signing would be provided and would provide motorists with clear directions about which lane they should be in for their intended exit.
15. This existing weaving segment would remain but improved as vehicles on westbound I-690 would only need to move over one lane to use the North Geddes Street exit ramp. The existing configuration forces drivers to move over two lanes to exit therefore increasing potential conflicts. Increasing the spacing between these ramps would require moving one of the two ramps, thus increasing ROW impacts.
16. This spacing is a result of the new eastbound I-690 off-ramp to northbound I-81. Properly spaced overhead signing would be provided and would provide clear directions to motorists which lane they should be in for their intended exit.
17. This spacing is a result of the new southbound I-81 off-ramp to westbound I-690. Increasing this spacing would have the detrimental effect of either reducing the weaving segment formed by the West Street on-ramp and the Geddes Street off-ramp or reducing the vertical clearance between the southbound I-81 off-ramp to westbound I-690 and the westbound I-690 off-ramp to West St.

**Pavement and Shoulder**

Due to a number of factors, including profile changes, horizontal alignment changes, and construction phasing implications, it was determined that pavement rehabilitation for I-81 and I-690, within the I-81 Viaduct Study Area would not be considered and the pavement would be reconstructed. In addition, the Project also includes a variety of work on city streets. Due to the nature of the work, the anticipated amount of utility relocation work, and the anticipated disturbance from highway and bridge reconstruction, it is assumed that city streets that are widened or re-aligned would be reconstructed, and that city streets proposed for traffic signal replacement and pavement re-striping would be milled and inlayed. In accordance with the NYSDOT Comprehensive Pavement Design Manual, a Pavement Evaluation and Treatment Selection Report (PETSR) has been prepared. The report provides recommendations regarding pavement type and pavement thickness design for new and reconstructed interstates, ramps, state routes, and local roads for the I-81 Viaduct Project. A life cycle cost analysis of both rigid and flexible pavement alternatives was developed. Refer to **Appendix A-4** for a copy of the PETSR.

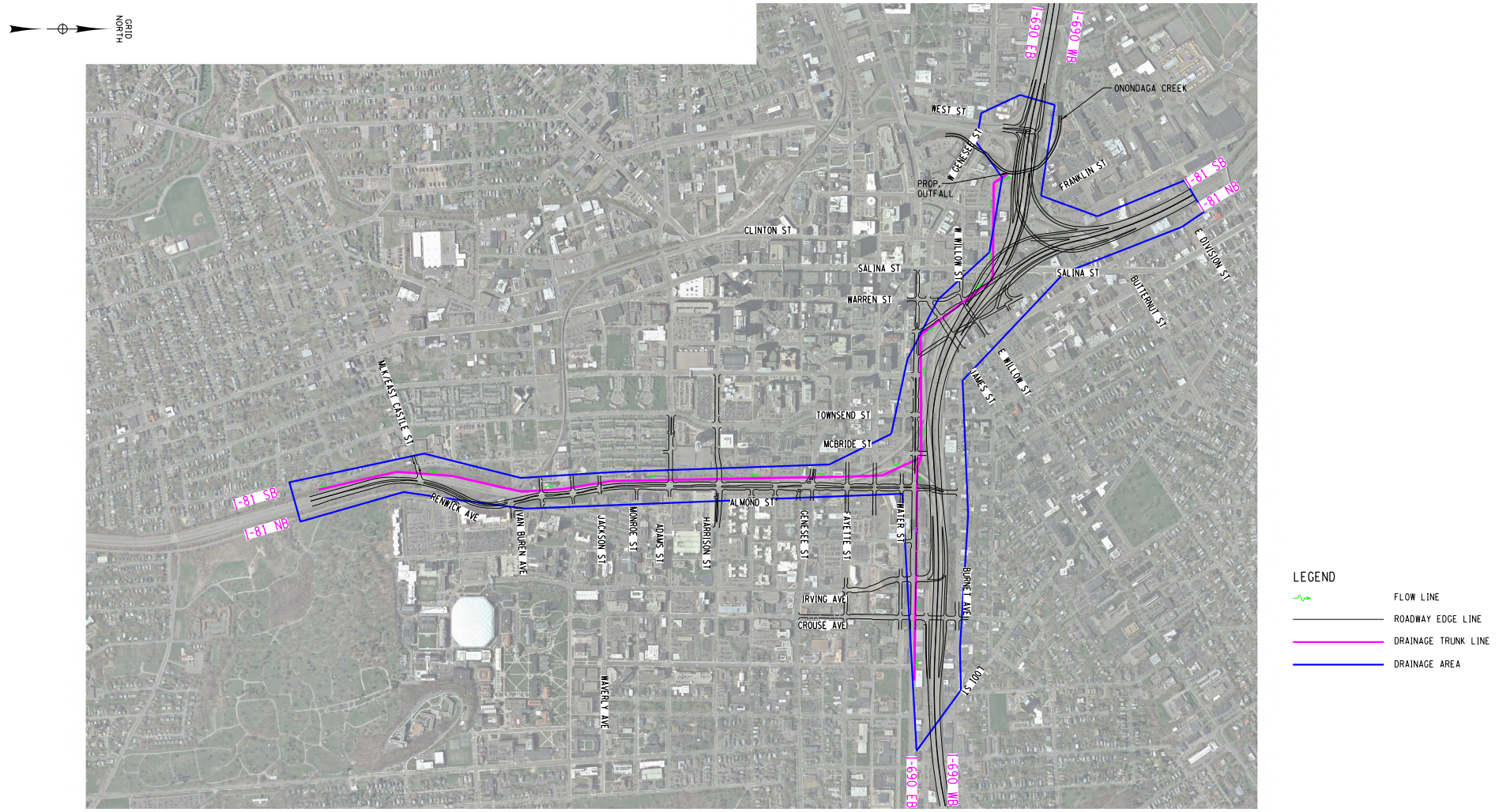
### Drainage Systems

The storm sewer systems that serve the I-81 and I-690 highway segments within the Project Area are tributary to Onondaga County and City of Syracuse combined sewers, and are subject to the requirements of the New York Department of Environmental Conservation's (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002). A Stormwater Pollution Prevention Plan (SWPPP) with the appropriate stormwater management and sediment and erosion control measures will be developed for the Project. Stormwater quality treatment will be required for this Project and the County and City both require a reduction in the amount of stormwater runoff volume that will be discharged into their systems.

An analysis of the existing and proposed highway stormwater runoff was undertaken for the Viaduct Alternative. The analysis focused on the stormwater runoff within the primary Project Area (see **Figure 5-14)**. The Project is located within a dense urban area where most of the surfaces are impervious. Surface runoff drains first to catch basins that are connected to the City of Syracuse combined sanitary and storm sewer system, which in turn discharges into the county combined sewer system. The existing combined sewer system is vulnerable to combined sewer overflows during rain events and the entire Project Area is under substantial restrictions to control water quality and water quantity.

Within the project drainage area, stormwater flows to a number of connection points, which lead to the County/City combined sewer system. A comparison between the existing impervious areas and the proposed areas shows that there is less than a 0.7 percent increase in impervious area under the Viaduct Alternative (refer to **Table 5-52**). This assumes that the areas within the existing viaduct area at ground level will be re-developed using impervious land uses such as asphalt parking and sidewalks. Should this area be re-developed using pervious land uses such as basins, landscaping, or parking lots with pervious pavements, there could be up to a 3.6% reduction in impervious area and resulting runoff, not including any additional reductions that may result from required water quality treatment areas or channel protection.

Since peak flow and the total volume of runoff are directly attributable to the total amount of impervious area, the peak flow could be reduced with reduction techniques such as removal of parking areas used on I-81 or I-690 right-of-way, through the use of pervious pavements in replacement parking lots and road shoulders, or with at grade detention or retention basins. Pervious pavements store water in the voids of the pavement or in the voids of the aggregate sub-base beneath the pavement and slowly discharge to groundwater. Depending on the infiltration capacity of the underlying native material, the pervious pavement and aggregate base material would be an underground infiltration basin and reduce the runoff rate from these areas to zero. Appropriate application could result in the built condition matching the existing condition runoff rate, resulting in decreases in flow to the existing combined sewer systems. While the NYSDEC may allow elimination of the water quantity reduction requirements for redevelopment projects having only minor increases in impervious area, because the City and County are under a court injunction to reduce flows to the combined sewer system, it is unlikely that water quantity reductions requirements would




Drainage Study Boundary

**Figure 5-14**

be relieved for this Project if continued connections to the combined sewer system is maintained.

**Table 5-52**
**Drainage Area and Peak Flow Comparison- Viaduct Alternative**

| | Total Existing Drainage Area | Open Areas Redeveloped as Impervious Area [2] | Open Areas Redeveloped as Pervious Area [3] |
|---|---|---|---|
| Total Area [1] | 502.2 acres | 502.2 acres | 502.2 acres |
| Pervious Area | 179.0 acres | 176.9 acres | 190.6 acres |
| Impervious Area | 232.2 acres | 325.3 acres | 311.5 acres |
| Impervious Area Change | 0 | 0.7 % | -3.6% |
| Project Runoff | | | |
| 1-year (4.34 inches/hr.) | 682.6 cfs | 686.6 cfs | 672.5 cfs |
| 10-year (4.13 inches/hr.) | 1,515.6 cfs | 1,524.6 cfs | 1493.3 cfs |
| 100-year (4.34 inches/hr.) | 1,923.0 cfs | 1,934.4 cfs | 1,894.7 cfs |

**Notes:**

1. Total Area includes I-481 Study Areas even though no improvements are required along I-481 under this alternative.
2. Impervious Development assumes that the areas opened up as a result of highway and viaduct modifications under this alternative are redeveloped as impervious land uses similar to the existing uses.
3. Pervious Development assumes that the areas opened up as a result of highway and viaduct modifications under this alternative are redeveloped as pervious land uses such as basins, pervious pavements, and landscaped areas.
4. Rainfall intensity based on NOAA 14 Point Precipitation Frequency for the I-81/I-690 interchange for the 15 minute Time of Concentration.
5. CFS = Cubic Feet per Second.

The existing I-81 drainage system connects to the combined sewer system using small diameter pipes that likely do not meet the current design standards. A new storm drain outfall to a large capacity system would be required to achieve current design standards for storm drain design of the freeway system. This new outfall would be common to all alternatives considered, except the no-built alternative. This new outfall would have to show that there are no adverse effects to the downstream watercourses.

Because of the small increase in impervious area, Water Quantity controls may be waived as design advances and a downstream analysis is provided that shows no adverse impacts. There are two basic concepts that could be utilized to reduce the amount of stormwater runoff discharging into the existing combined sewer system and meet the water quantity reduction requirements: continued use of the existing combined sewer system in combination with on-site storage or detention, or construction of a new storm drain outfall to a large-capacity waterbody.

Continued use of the existing combined sewer system would require implementation of water quantity reduction measures, the most likely of which would include permeable pavement and stormwater retention basins within the Project Area. **Table 5-53** shows the anticipated water quantity volume that would be required to be retained on site for the Viaduct Alternative. This water would be required to be stored in retention basins at the ground level or below ground levels. The amount of surface area that may be required for these basins would substantially reduce future re-development options.

Alternatively, with the large amount of construction that would be required under the Viaduct Alternative, supplemental drainage capacity could be added to the primary project corridor. The additional capacity would intercept a substantial amount of the Project Area drainage, thereby reducing the amount of stormwater discharge into the combined sewer system. This option would include constructing a new storm sewer trunk line within the project right-of-way, from the southern limit of the I-81 Viaduct Study Area, along the Almond Street corridor, then westward along the I-690 corridor, to a new outlet at Onondaga Creek. This new storm trunk sewer would provide a positive drainage outlet without substantially using the existing combined storm drain system. Isolated connections to the existing combined sewer system may be utilized in some isolated areas that are not able to be connected to the new storms drain system due to elevation or to avoid substantial utility relocations.

**Table 5-53**
**Water Quantity Reduction Volume-Viaduct Alternative**

| Area | Total Impervious Area [1] (Acres) | Total Disturbed Area (Acres) | Water Quality Volume[2] (acre-ft) |
|---|---|---|---|
| I-81 Corridor, Colvin St. to MLK. Jr., East | 6.42 | 8.58 | 0.409 |
| I-81 Corridor, MLK. Jr., East to Burt St. | 3.58 | 9.92 | 0.204 |
| I-81 Corridor, Burt St. to Adams St. | 5.11 | 7.66 | 0.366 |
| I-81 Corridor, Adams St. to E. Genesee St. | 6.35 | 7.63 | 0.435 |
| I-81 Corridor, E. Genesee St. to Erie Blvd. | 6.00 | 8.47 | 0.616 |
| I-81 Corridor, Davidson St. to Salina St. | 10.36 | 14.00 | 0.714 |
| I-690 Corridor, Leavenworth Ave. to Salina St. | 13.24 | 19.45 | 0.938 |
| I-690 Corridor, Salina St. to Townsend St. | 19.88 | 20.17 | 1.760 |
| I-690 Corridor, Townsend St. to Forman Ave. | 9.58 | 12.06 | 0.811 |
| I-690 Corridor, Forman Ave. to Crouse Ave. | 6.23 | 6.58 | 0.548 |
| I-690 Corridor, Crouse Ave. to Lodi St. | 6.85 | 9.10 | 0.692 |
| Total | 93.60 | 123.62 | 7.493 |

**Notes:**
1. Includes new development impervious area plus redevelopment impervious area within the project area under the Viaduct Alternative and does not include areas in the comparative Total Area that are not physically impacted by this Alternative.
2. NYSDEC formula which includes Total Impervious Area and Total Disturbed Area as variables.
3. The Viaduct Alternative does not require changes along I-481 and those areas are not included.

The Conceptual Storm Sewer Trunk Line would be designed based on a 50-year design storm frequency and would begin as a 72-inch-diameter pipe at the south end of the I-81 Viaduct Study Area (south of Martin Luther King East) and increase in diameter to a 96-inch-diameter pipe before out-letting to Onondaga Creek. A conceptual plan and profile are shown in Appendix A-1. The exact location of the storm sewer trunk line would be developed when design advances. A new storm sewer trunk line would meet the local requirement to provide for an overall decrease in total stormwater volume contributing to the combined sewers, which in turn would help reduce the number of combined sewer overflows that currently occur in the existing system as well as reduce the amount of stormwater contributing to the county sanitary sewer treatment facility.

In addition to addressing the volume of runoff, water quality treatment also would be required, based on the total amount of impervious area. Water quality treatment for the new bridges and roadway pavements would be accommodated in basins, pervious pavements, or infiltration basins as space permits. Due to the urban nature of the Project Area and the limited space available for traditional treatment systems, more compact treatment devices may be evaluated to meet NYSDEC requirements to remove the pollutants expected from the pavement runoff. These devices would be proprietary hydrodynamic treatment systems that several manufacturers offer. While some of these devices have excellent removal properties, intensive maintenance effort and cost will be a factor in selection of the required treatment system. Evaluation of these devices would be conducted when design advances, as well as when detailed coordination with NYSDEC will occur and the appropriate water quality treatment systems needed for each drainage area will be selected. Additionally, as a result of installing a new trunk line storm sewer as part of this alternative, the demand on the existing combined sewer system will be reduced, which will result in a reduction in the number and magnitude of combined storm water overflows within the existing watershed. The new trunk storm sewer, in combination with peak flow mitigation for any increases in impervious area and water quality treatment for new paved surfaces, will result in improvements to downstream receiving waters.

### Geotechnical

Study of the overall existing soil borings data and record plans indicated that the underlying soils at the Project Area generally consist of silt and clay with bedrock or shale. The depth of bedrock varies along the project alignment from approximately 20 feet to 70 feet below ground. As such, the placement of a new structure in the area would require the use of pile foundations to provide stability and minimize settlement of poor soil. Piles for the new bridge would bear on bedrock where appropriate.

### Structures

Approximately 49 existing bridges would be replaced with approximately 45 new bridges, having a total deck area of about 1,765,000 square feet. In addition, one additional bridge would be rehabilitated as part of the Viaduct Alternative (see **Table 5-54**). All new bridges would conform to current standards and would incorporate aesthetic treatments where appropriate. Refer to Preliminary Structure Plans in **Appendix A-1** for a listing of new bridges as well as more detailed information for the proposed replacement bridges.

**Table 5-54**
**Existing Bridges Impacted by Viaduct Alternative**

| BIN | Location | Replaced |
|---|---|---|
| 1031570 | BUTTERNUT STREET OVER I-81 | Replaced |
| 103156D | SB I-81 RAMP OVER GENESEE STREET | Replaced |
| 103156C | NB I-81 RAMP OVER GENESEE STREET | Replaced |
| 103156A | SB I-81 RAMP OVER JACKSON STREET | Replaced |
| 103156B | NB I-81 RAMP OVER JACKSON STREET | Replaced |
| 1031559 | I-81 OVER MARTIN LUTHER KING EAST (E. CASTLE STREET) | Replaced |
| 1031569 | I-81 VIADUCT FROM FAYETTE STREET TO VAN BUREN STREET | Replaced |
| 1050779 | I-690 OVER LEAVENWORTH AVE | Replaced |
| 1051091 | EB I-690 OVER N CROUSE AVE | Replaced |
| 1051092 | WB I-690 OVER N CROUSE AVE | Replaced |
| 1051119 | I-690 OVER LODI STREET | Replaced |
| 1050001 | SB N WEST STREET OVER HIGHWAY 5 | Replaced |
| 1050002 | NB N WEST STREET OVER HIGHWAY 5 | Replaced |
| 1050780 | N WEST STREET RAMP TO WB I-690 OVER I-690 | Replaced |
| 1050790 | WB I-690 RAMP TO N WEST STREET OVER I-690 | Replaced |
| 1050800 | BUTTERNUT STREET TO SB N WEST STREET OVER ONONDAGA CREEK | Replaced |
| 105080A | WB I-690 RAMP TO SB N WEST STREET OVER ONONDAGA CREEK | Replaced |
| 1050821 | WB I-690 OVER ONONDAGA CREEK | Replaced |
| 1050822 | EB I-690 OVER ONONDAGA CREEK | Replaced |
| 1050840 | NB N WEST STREET RAMP TO EB I-690 OVER ONONDAGA CREEK | Replaced |
| 1050010 | NB N WEST STREET RAMP TO HERALD PLACE OVER ONONDAGA CREEK | Replaced |
| 1050851 | WB I-690 OVER N FRANKLIN STREET | Replaced |
| 1050852 | EB I-690 OVER N FRANKLIN STREET | Replaced |
| 1054020 | WB I-690 OVER N CLINTON STREET | Replaced |
| 1008489 | I-81 OVER N SALINA STREET | Replaced |
| 1050910 | WB I-690 OVER N SALINA STREET | Replaced |
| 1095510 | WB I-690 OVER I-81 | Replaced |
| 1050921 | WB I-690 OVER E WILLOW STREET | Replaced |
| 1050922 | WB I-690 RAMP TO NB I-81 OVER E WILLOW STREET | Replaced |
| 105388A | SB I-81 RAMP TO EB I-690 OVER E WILLOW AND JAMES | Replaced |
| 1053882 | NB I-81 OVER E WILLOW, JAMES, AND N STATE | Replaced |
| 1051000 | I-690 OVER N CLINTON, N SALINA, E WILLOW, JAMES, AND N STATE | Replaced |
| 1050950 | WB I-690 OVER JAMES AND N STATE | Replaced |
| 1053881 | SB I-81 OVER E WILLOW, JAMES, AND N STATE | Replaced |
| 105095A | NB I-81 RAMP TO WB I-690 OVER N STATE STREET | Replaced |
| 105100A | EB I-690 RAMP TO SB I-81 OVER N TOWNSEND STREET | Replaced |
| 1051030 | WB I-690 OVER N TOWNSEND STREET | Replaced |
| 1053870 | NB I-81 OVER N TOWNSEND STREET | Replaced |
| 1051050 | WB I-690 OVER N MCBRIDE STREET | Replaced |
| 1051061 | WB I-690 OVER N CATHERINE STREET | Replaced |
| 1053860 | SB I-81 FROM HIGHWAY 5 OVER N TOWNSEND STREET | Replaced |
| 1064590 | WB I-690 RAMP TO SB I-81 OVER E FAYETTE, E WASHINGTON, E | Replaced |

**Table 5-54**
**Existing Bridges Impacted by Viaduct Alternative**

| BIN | Location | Replaced |
|---|---|---|
| | WATER, HIGHWAY 5, AND ALMOND | |
| 1051062 | EB I-690 OVER CATHERINE STREET | Replaced |
| 1051063 | EB I-690 RAMP OVER CATHERINE STREET | Replaced |
| 105384A | NB I-81 RAMP TO EB I-690 OVER HIGHWAY 5 | Replaced |
| 1053840 | NB I-81 RAMP OVER HIGHWAY 5 | Replaced |
| 1031580 | SPENCER STREET OVER I-81 | Replaced |
| 1031590 | COURT STREET OVER I-81 | Replaced |
| 1031600 | BEAR STREET (ROUTE 298) OVER I-81 | Replaced |
| 1031639 | SB I-81 RAMP OVER CAROUSEL CENTER DRIVE, LEY CREEK, CSX TRANSPORTATION, AMTRAK | Widen & Rehabilitate |

### Hydraulics of Bridges and Culverts

As previously noted, only the replacement bridges over Onondaga Creek would need a hydraulic analysis and there are no known hydraulic issues associated with the existing retaining walls and existing bridge piers. As part of this alternative, the existing retaining walls and piers would be retained or reconstructed as necessary and any replacement piers and retaining walls would be placed further back from the creek than the existing piers and retaining walls. As a result, no adverse effects on hydraulics are anticipated, as the existing conditions would be either maintained or improved. In addition, due to the topography of the area and the elevation of the bridges over the creek, it is anticipated that the freeboard provided below all structures at the 100-year flood will be much greater than the 2-ft minimum required; therefore, a hydraulic study will not be required until when design advances. A Coast Guard Checklist is not required.

### Guide Railing, Median Barriers, and Impact Attenuators

All guiderail within the project limits including bridge railing would be evaluated when design advances for conformance to design standards and replaced or repaired, if necessary.

### Utilities

Due to the urban nature and size of the Project Area, there are an extensive number and network of utilities, both private and public, above ground and below ground. A summary of the major utilities, the utility owners and the potential conflicts associated with the Viaduct Alternative is included in **Table 5-55**. For the purposes of this report, major utilities are defined as: all underground electric, fiber optic, or steam facilities (not including services), overhead fiber optic, underground gas lines (8 inches diameter or larger), water mains 16 inches in diameter or larger, and sanitary sewer and storm sewer trunk lines 24 inches in diameter or larger. Utilities of unknown size are also included. Because the depth of many underground utilities is not known, and because the depth of impacts from proposed construction is uncertain, impacts are assumed for any major underground utility in a reconstruction area.

There will be many more impacts to non-major utilities within the project area that are not included in this table, including such things as hydrants, valves, and services. The impacts to those items will need to be addressed as design advances.

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| **I-81: Southern Project Limits to E. Washington Street - Utility Impacts** | | | | | |
| OCWEP | Sanitary Sewer 24" to 36" | 24" line crossing under I-81 at the center of E. Castle St. from the west project limit of E. Castle St. to approx. 100' east of I-81, continuing south on west side of the NYSW RR tracks to a manhole approx. 50' east of I-81 | 1255 | I | Yes |
| | | Center of Renwick Ave. from a manhole approx. 120' west of E. Raynor Ave. and Fineview Place to a manhole approx. 420' south of Van Buren Street | 295 | I | Yes |
| | | East side of Almond Street from E. Taylor Street to Dyer Court, and from Monroe Street to Cedar Street | 1940 | I | Yes |
| | | Center of Madison Street from Almond Street to east project limits | 90 | I | Yes |
| | | Crossing Cedar Street approximately 25 feet east of Almond Street | 90 | E/R | Yes |
| | | 24" line center of E. Genesee St. EB from Almond St. to east project limit | 690 | I | Yes |
| | | Multiple locations along E. Genesee Street at Almond Street | 975 | I | Yes |
| | Sanitary Sewer 36" to 66" | 36" line crossing east-west through project limits at E. Raynor Ave | 370 | E/R | Yes |
| | | 48" to 66" line on the South side of Harrison Street, crossing I-81 and Almond Street from west to east project limit | 890 | I | Yes |
| OCWEP | Sanitary Sewer Force Main 10" / 14" | South side of Van Buren Street from Stadium Place to Renwick Ave, northwest along Almond Street | 625 x 2 | I | Yes |
| | Sanitary Sewer Force Main 14" | West side of Stadium Place south to Stadium Street project limits | 5 | E/R | Yes |
| | Sanitary Sewer Force | South side of Van Buren Street north to Van Buren Street project limit, approx. 75' east of | 50 x 2 | E/R | Yes |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | Main<br>4" / 8" | Henry Street | | | |
| OCWEP | Storm Sewer 24" to 36"x60" | Catch basin at center of I-81 approx. 1620' south of E. Castle St., northwest to west project limit | 240 | E/R | Yes |
| | | East side of Almond Street from Dyer Court to Monroe Street, then crossing west across Almond Street | 575 | I | Yes |
| | | East side of Almond Street from Cedar Street to E. Genesee Street | 440 | I | Yes |
| | | 36"x60" line at center of E. Fayette Street within project limits | 540 | I | Yes |
| | | Center of E. Washington Street east of Almond Street, discharging to manhole at Almond Street | 100 | I | Yes |
| City of Syracuse | Water<br>16" to 30" | I-81 west project limit at E. Kennedy St., crossing to east of I-81, north to approx. 400' south of Renwick Ave., east to project limit (24" & 20") | 760 x 2 | E/R | Yes |
| | | South side of E. Castle Street from a valve west of I-81 to west and north project limits of E. Castle Street | 270 | I | Yes |
| | | Crossing under I-81 approx. 770' north of E. Castle Street, from the west project limit to east of Fineview Place, continuing north to the project limit at Renwick Ave and Almond Street | 735 | I | Yes |
| | | Center of Monroe Street, to Almond Street, north up east side of Almond Street to Harrison Street, east to project limits | 1500 | E/R | Yes |
| | | Center to south side of Harrison St., crossing I-81 and Almond St. from west to east project limit | 890 | I | Yes |
| | | Center of E. Genesee Street within project limits | 590 | I | Yes |
| OCWA | Water 30" | Crossing from west side of I-81 at E. Castle Street to the NYSW RR tracks east of I-81, continuing south on west side of NYSW tracks and exiting at east project limit | 830 | I | Yes |
| Alliance | Gas 12" | East side of Renwick Avenue, continuing north along the east side of Almond Street to E. Taylor Street | 1000 | I | No |
| | | South of Burt Street at west project limit, crossing to gas marker east of Almond Street | 135 | I | No |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | Gas<br>Unknown size | Approx. 140' north of Burt St. at west project limit, continuing southeast and crossing to gas marker east of Almond Street | 150 | I | No |
| National Grid | Gas<br>8" to 12" | South side of Burt Street crossing to east side of Almond Street, to north side of Van Buren Street, east to Irving Avenue, north to Irving Avenue project limit | 1540 | I | Yes on Almond St. only, No at other locations |
| | | South side of Monroe Street within project limits, east side of Almond Street north to north side of E. Adams Street, west across Almond St. to E. Adams Street west project limit | 865 | E/R | No |
| | | North side of Harrison Street within project limits | 765 | I | No |
| | | North side of E. Genesee within project limits | 635 | I | No |
| | | North side of E. Fayette Street within project limits | 555 | I | No |
| AT&T | Underground Fiber Optic | Crossing Renwick Ave., approx. 10' west of the NYSW RR tracks, from the east to the west project limit of Renwick Ave. | 145 | E/R | Yes, south of Raynor Ave., No at other locations |
| | | Crossing I-81 at approx. 150' south of Almond St. from the east to the west project limit. Utility runs parallel with NYSW RR track. | 265 | E/R | Yes |
| Verizon | Underground Fiber Optic | Manhole north of Almond Street at Renwick Ave., east to north side of Van Buren Street, continuing east to Irving Ave. project limit | 925 | E/R | No |
| | | South sidewalk of Burt Street within project limits | 160 | I | No |
| | | Approx. 50' south of E. Washington Street within project limits | 580 | I | No |
| | | Manhole in center of Almond Street at E. Washington Street to E. Washington Street south project limit | 60 | I | No |
| Wind-stream | Underground Fiber Optic | Two locations crossing E. Adams Street and Almond Street | 355 | I | No |
| Elantic | Underground Fiber Optic | North side of Burt Street, west side of Almond Street, and south side of Taylor Street | 430 | I | No |
| Light Tower | Underground Fiber Optic | East side of Almond St. from Van Buren Street (at UP #NM13) to E. Taylor Street (UP# NYT22 NG25) | 765 | I | Yes |
| | | East side of Almond St. from pole 100' north of Monroe Street running north to Adams Street | 300 | I | No |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | | North and south sides of E. Fayette Street from west project limits crossing Almond Street | 1460 | I | No |
| Syracuse University | Underground Fiber Optic | North side of Burt Street, north approx. 85', crossing Almond St., southeast to east project limits | 335 | I | No |
| Telergy | Underground Fiber Optic | North side of Burt Street, crossing to east side of Almond Street | 130 | I | No |
| Upstate | Underground Fiber Optic | North of Harrison Street, crossing Almond Street from west to east project limit | 620 | I | No |
| Light Tower/ Elantic | Overhead Fiber Optic | South side of E. Taylor Street within project limits, and extending north along east side of Almond Street to E. Adams Street. | 1385 | I | No |
| | | South side of Monroe Street within project limits | 80 | E/R | No |
| National Grid | Underground Electric | Multiple locations along Almond Street, Van Buren Street, Burt Street, E. Taylor Street, Jackson Street / Dyer Court, Monroe Street, E Adams Street, Harrison Street, Madison Street | 16,305 | I | Yes, on east side of Almond St., between Van Buren St. and Burt St. |
| | Underground Electric Duct bank | Multiple locations along Almond Street and Van Buren Street | 3300 | I | Yes, on east side of Almond St., between Van Buren St. and Burt St. |
| | Underground Electric 2.4-13.2 kV | East side of Almond Street from E. Adams Street to Madison Street Two locations crossing Almond Street at E. Adams Street | 1925 | I | No |
| | | Crossing Almond Street at E. Genesee Street | 605 | I | No |
| | Underground Electric 34.5kV | South sidewalk of Burt Street, crossing Almond Street from west to east project limit | 160 | I | No |
| | | Crossing Almond Street north of E. Genesee Street within project limits | 345 | I | No |
| | Underground Electric 115 kV | North side of E. Taylor Street at west project limit to a manhole in the center of Almond St., continuing southwest to SU Steam Station | 175 | I | No |
| | | South sidewalk of E. Fayette Street within project limits | 530 | I | No |
| Charter Communications | Underground Cable TV | Circling from north side of E. Genesee Street EB, to east side of Almond Street, to north side of E. Genesee Street WB | 490 | I | No |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| Syracuse University | Underground Telephone | Van Buren Street between Renwick Ave. and Irving Ave. | 1185 | I | No |
| Light Tower | Underground Telephone | South side of E. Adams Street within project limits | 425 | I | No |
| Verizon | Underground Telephone | East side of Almond Street from south side of E. Adams Street to north side of Cedar Street | 1300 | I | No |
| Unknown | Underground Telephone | South sidewalk of Burt Street within project limits | 160 | I | No |
| Syracuse University | Chilled Water Service & Return 18" to 24" | Crossing Van Buren Street to east sidewalk of Henry Street, south to Henry Street project limit | 100 | E/R | No |
| | | Crossing Almond St. from the SU Steam Station to the east project limit | 155 | I | No |
| Syracuse University | Steam (12" to 14") & Condensate (8" to 10") | West side of Almond Street from Van Buren Street to Taylor Street | 870 | I | No |
| | | South side of Van Buren Street from Almond Street to Stadium Place | 555 | I | No |
| | | North and south sidewalks of Taylor Street within project limits | 340 | I | No |
| | **I-81: Hiawatha Blvd. to Butternut St. - Utility Impacts** | | | | |
| **Owner** | **Type** | **Location** | **Length (FT)** | **Impacts** | **Reimbursable?** |
| OCWEP | Sanitary Sewer 24" to 48" | 33" line crossing I-81 approx. 140 ft. south of Hiawatha Blvd. W. | 300 | I | Yes |
| | | East Side of I-81 NB from Wolf Street to Hiawatha Blvd. | 550 | I | Yes |
| | | Approx. 160 ft. south of Hiawatha Blvd. W. from eastern project limits to middle of I-81 SB | 160 | I | Yes |
| | | 48" line from middle of Bear St. from western project limits crossing I-81 | 700 | I | Yes |
| | | Middle of Sunset Ave within project limits near Court St. | 95 | I | Yes |
| City of Syracuse | Sanitary Sewer 24" to 36" and unknown | Middle Genant Drive approx. 1000 ft. north of Butternut Street to approx. 350 ft. north of Butternut Street | 540 | I | Yes |
| | | West side of Sunset Ave within project limits | 125 | E/R | Yes |
| | | West side of N. State Street within project limits at intersection of Spencer Street and N. State Street | 125 | I | Yes |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | | Middle of Basin Street from Kirkpatrick Street to southern project limits on Basin Street | 335 | I | Yes |
| | | Middle of Genant Drive from approx. 200 ft north of Court Street to south side of Bear Street | 885 | I | Yes |
| City of Syracuse | Water 20" and unknown | West side of N. State Street crossing Spencer Street | 125 | I | Yes |
| | | Middle of N. State Street crossing Butternut Street, with a line coming from Salt St. | 485 | I | Yes |
| | | Middle of Sunset Avenue near Court Street | 95 | I | Yes |
| | | West side of Sunset Avenue crossing Basin Street | 100 | E/R | Yes |
| OCWA | Water 24" | 2 parallel lines crossing I-81 Approx. 200 ft. south of Hiawatha Blvd. W. | 600 | I | Yes |
| National Grid | Gas 16" | West side of I-81 SB on ramp near Destiny USA from western project limits to end of gas line. | 400 | I | No |
| | Gas 8" | 3 lines on East side of N. State Street at Spencer Street intersection | 390 | I | No |
| | Gas Unknown Size | Various locations on east side of I-81 NB, Bear Street, Spencer Street, Ash Street, Genant Drive, N. Clinton Street, and N. Franklin Street | 4400 | I | No |
| Elantic | Underground Fiber Optic | Crossing I-81 approx. 650 ft. north of Butternut Street | 375 | I | No |
| | | West side of N. Clinton Street within project limits at Genant Drive | 445 | I | No |
| Level 3 Com | Underground Fiber Optic | West side of I-81 SB starting from approx. 150 ft south of Hiawatha Blvd. W. extending to Bear Street | 1530 | I | No |
| | | South side of Bear Street within project limits | 625 | I | No |
| | | Middle of Genant Drive from Bear Street to W. Division Street | 3400 | I | No |
| Verizon | Underground Fiber Optic | Middle of N. Clinton St. from Spencer Street to southern project limits | 180 | I | No |
| | | Crossing I-81 approx. 400 ft. north of Butternut Street | 360 | I | No |
| | | West side of Genant Drive from 800 ft. north of Butternut Street, south for approx. 335 ft., east across I-81 to intersection of Butternut Street and N. State Street, then north on N. State Street to | 940 | I | No |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | | project limits | | | |
| Unknown | Underground Fiber Optic | Middle of N. State Street at Butternut Street intersection | 290 | I | No |
| | | Middle of N. State Street at Spencer Street intersection | 125 | I | No |
| National Grid | Underground Electric | Multiple locations on Hiawatha Blvd. W., Bear Street, N. Clinton Street, Sunset Avenue, Genant Drive, Spencer Street, Court Street, W. Division Street, Ash Street, and Butternut Street | 9765 | I | No |
| | Underground Electric 115 KV | Middle of N. State Street from northern to southern project limits at the intersection of Spencer Street and N. State Street | 125 | I | No |
| | | North side of W. Division Street from western project limits on W. Division Street, crossing I-81 to eastern project limits | 270 | I | No |
| | | West side of Genant Drive from approx. 350 ft. south of W. Division Street to intersection of Genant Drive and N. Clinton Street | 900 | I | No |
| | **I-690: Leavenworth Ave to Franklin St. - Utility Impacts** | | | | |
| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
| OCWEP | Sanitary Sewer 52"x78" | East side of Onondaga Creek heading northeast to eastern project limits at Butternut Street | 1740 | I | Yes |
| | Sanitary Sewer 72" | East side of Onondaga Creek heading east to project limits on N. Salina Street | 1280 | I | Yes |
| | Sanitary Sewer 72" | From northern project limits of Pearl Street to eastern project limits at N. State Street and James Street | 1010 | I | Yes |
| | Sanitary Sewer 72" | Varies approx. 30-100 ft on the east side of Onondaga Creek from northern project limits to southern project limits near Herald Place | 470 | I | Yes |
| City of Syracuse | Sanitary Sewer 30" to Unknown | Approx. 440 ft. west of West Street, crosses West Street to I-690 WB on ramp | 80 | I | Yes |
| | | From northern project limits on Herald Place to southern project limits on Wallace Street | 210 | I | Yes |
| Unknown Owner | Sanitary Sewer Size Unknown | Middle of Genesee Street from approx. 180 ft. from Wallace Street, east and then south at N. Franklin Street to project limits. | 710 | I | Probable |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| City of Syracuse | Water 16" to 20" | From intersection of W. Genesee Street & West Street south to project limits on West Street | 1075 | I | Yes |
| | | From intersection of W. Genesee Street & West Street across parking lot to project limits on Herald Place | 1030 | I | Yes |
| | | From intersection of W. Genesee Street & West Street heads west to project limits | 400 | I | Yes |
| National Grid | Gas Size Unknown | West side of West Street from southern project limits approx. 200 ft. south of Park Ave. to approx. 180 ft. north of Park Ave., and along south side of Park Ave to western project limits. | 450 | I | No |
| | | North side of Erie Blvd. from western project limits near West Street to eastern project limits | 365 | I | No |
| Elantic | Underground Fiber Optic | Middle of Genesee Street from Wallace Street to N. West Street | 620 | I | No |
| | | N. Franklin Street from Genesee Street to northern project limits | 90 | E/R | Yes, north of I-690 |
| Unknown | Underground Fiber Optic | Crosses Genesee St. in between N. Clinton St. and N. Salina St. | 135 | E/R | No |
| Verizon | Underground Fiber/ Telephone | Approx. 400 ft. west of West Street running N/S, crossing all I-690 Lanes | 260 | I | No |
| National Grid | Underground Electric | Middle of N. Clinton Street from southern limits to approx. 110 ft. north of Genesee Street | 210 | E/R | No |
| Unknown | Unknown Pipe 24" | Mounted on north side of Herald Pl bridge over Onondaga Creek | 190 | I | Unknown |
| | **I-690: Franklin St. to Almond St. - Utility Impacts** | | | | |
| **Owner** | **Type** | **Location** | **Length (FT)** | **Impacts** | **Reimbursable?** |
| OCWEP | Sanitary Sewer 60" and 7.5'x10.5' | 60" line in the middle of Burnet Ave from western to eastern project limits near Catherine St. | 180 | I | Yes |
| | | 7.5'x10.5' line on the south side of Erie Blvd. from eastern project limits to western project limits | 1500 | I | Yes |
| City of Syracuse | Sanitary Sewer Size Unknown | Multiple locations on Herald Place, N. Salina Street, N. Clinton Street, N. Franklin Street, Wallace Street, McBride Street, Erie Blvd, E. Water Street, and Catherine Street | 1125 | I | Yes |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| Unknown Owner | Sanitary Sewer 36" | Starts on west side of N. State Street approx. 150 ft. north of Erie Blvd. E. intersection. End location is unknown. | Unknown | U | Probable |
| OCWEP | Storm Sewer 24" to 36" | Various locations on Butternut Street, E. Willow Street, Erie Blvd, N. Warren Street, I-690, and I-81 | 1400 | I | Yes |
| | Storm Sewer 42" | Approx. 50 ft. east of VIP Structures from middle of N. Salina Street to VIP parking lot. | 105 | I | Yes |
| | Storm Sewer 7'x4.5' | Starts approx. 110 ft. east of N. Clinton Street then heads southeast reaching the southern project limits on E. Willow St. | 565 | I | Yes |
| | Storm Sewer Size Unknown | North side of Erie Blvd. east to McBride Street then back to Townsend Street on the south side of Erie Blvd. | 1430 | I | Yes |
| City of Syracuse | Water 16" to 24" | Middle of N. State Street from Burnet Avenue to Erie Blvd. E. | 565 | I | Yes |
| | | South side of E. Water Street within project limits | 1050 | I | Yes |
| | | From eastern project limits near E. Laurel Street, crossing I-81 to meet water line at Butternut Street | 330 | I | Yes |
| | | East Side of Butternut Street from connecting water line to southern project limits on N. Franklin Street approx. 290 ft. north of Herald Place | 590 | I | Yes |
| | | Middle of N. Franklin Street from EB I-690 to project limits 120 ft south of Herald Place | 175 | I | Yes |
| | | North side of Burnet Avenue within project limits | 180 | I | Yes |
| | | Middle of N. State Street from Burnet Avenue then turns west approx. 150 ft. north of Erie Blvd. E. and reaches the intersection on Erie Blvd. E. | 720 | I | Yes |
| | Water Unknown | Between Franklin Street and Clinton Street just south of EB I-690 | 360 | I | Yes |
| National Grid | Gas 8" to 12" | Multiple locations on east and west sides of N. Salina Street, east side of Townsend Street, east and west sides of N. State St., north side of Water Street, and east side of Catherine Street | 2770 | I | No |
| | Gas 16" | Multiple locations on west side of N. Franklin Street, north side of Erie Blvd, and north side of James Street | 2660 | I | No |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | Gas 20" | Middle of N. Franklin Street from approx. 250 ft. north of Butternut Street to 115 ft north of Herald Place | 670 | I | No |
| Elantic | Underground Fiber Optic | Middle of N. Franklin Street from approx. 150 ft. north of Butternut Street to 120 ft north of Herald Place | 580 | I | No |
| | | Middle of Herald Place from eastern project limits, south on Wallace Street to southern project limits | 330 | I | No |
| | | South side of E. Water Street from western project limits to eastern project limits near Almond Street | 1010 | I | No |
| Elantic / AT&T | Underground Fiber Optic | North side of E. Water Street from western project limits to eastern project limits near Almond Street | 1080 | I | No. |
| G4S | Underground Fiber Optic | North side of E. Willow Street from Pearl Street to N. Warren St. | 440 | I | No |
| Charter Communications | Underground Fiber Optic | East side of N. State Street from Burnet Avenue to Erie Blvd. E. | 475 | I | No |
| | | North side of Burnet Avenue from western to eastern project limits near Catherine Street | 180 | I | No |
| Verizon & AT&T | Underground Fiber Optic | Middle of N. Salina Street from northern project limits approx. 300 ft. south of Pearl Street, south to southern project limits | 760 | I | No |
| Verizon | Underground Fiber Optic | Crosses N. Clinton Street near VIP Structures then goes west on I-690 WB until meeting N. Clinton Street | 835 | I | No |
| | | Middle of Herald Place from N. Salina Street to western project limits at N. Clinton Street | 260 | I | No |
| | | North side of E. Willow Street from western project limits, south onto N. Warren Street to southern limits | 390 | I | No |
| | | North side of James Street from N. State Street to Oswego Blvd | 465 | I | No |
| | | Middle of State Street from Burnet Ave. to Erie Blvd. E. | 540 | I | No |
| | | Middle of Catherine Street from Burnet Ave to E. Adams Street | 3630 | I | No |
| Wind-stream | Underground Fiber Optic | North side of E. Water Street from eastern project limits to Catherine Street | 160 | I | No |
| Unknown | Underground | Multiple locations on E. Willow Street, James | 1755 | I | No |

**Table 5-55**
**Potential Utility Conflicts - Viaduct Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impacts | Reimbursable? |
|---|---|---|---|---|---|
| | Fiber Optic | Street, N. State Street, and Burnet Ave | | | |
| Unknown | Overhead Fiber optic | Multiple locations on E. Water Street, Catherine Street, Pear Street, and Hickory Street | 420 | I | No |
| Elantic | Overhead Fiber Optic | From western project limits on south side of E. Water St. | 125 | I | No |
| National Grid | Underground Electric Major Crossing | South side of E. Water Street from western project limits to eastern project limits near Almond Street | 1015 | I | No |
| National Grid | Underground Electric 115 KV | Middle of N. Franklin Street from approx. 200 ft. north of Butternut Street to Herald Place | 715 | I | No |
| National Grid | Underground Electric | Multiple locations on N. Franklin Street, James Street, Salina Street, E. Willow Street, State Street, E. Water Street, Erie Blvd, Herald Place, Genant Drive, and Catherine Street | 7140 | I | No |
| | **I-690: Almond St. to Lodi Ave - Utility Impacts** | | | | |
| **Owner** | **Type** | **Location/Side** | **Length (FT)** | **Impacts** | **Reimbursable?** |
| OCWEP | Sanitary Sewer 36” | Crossing under I-690 at the east side of N. Crouse Ave. from the southern to the northern project limit | 230 | I | Yes |
| City of Syracuse | Water 20” | Crossing under I-690 at the west side of N. Crouse Ave. from the southern to the northern project limit | 230 | I | Yes |
| National Grid | Gas 12” | Crossing under I-690 at the west side of Lodi St. from the southern to the northern project limit | 325 | I | No |
| National Grid | Underground Electric | Crossing under I-690 at the east side of N. Crouse Ave. from the southern to the northern project limit | 230 | I | No |

**Railroad Facilities** –

Under the Viaduct Alternative, there would be no impacts to the New York, Susquehanna & Western Railway, but coordination will be required for replacement of the I-81 bridges over the railroad. There are no other impacts to CSX or Amtrak under this alternative.

## LANDSCAPE AND ENVIRONMENTAL ENHANCEMENTS

### Landscape Development and Other Aesthetics Improvements

NYSDOT would provide or replace landscaping as a part of the overall enhancement and aesthetic improvements for this Project. Streetscape enhancements would be provided along Almond Street and portions of Erie Boulevard, West Street, as well as portions of connecting streets. Streetscape enhancements could include sidewalks, specialty pavements and aesthetic treatments for walkways, site furnishings such as benches and trash receptacles, landscape plantings, and green infrastructure. The enhancements would be designed to provide an overall sense of visual cohesiveness. The streetscape design would promote safe and effective pedestrian and bicyclist circulation and comfort, and help facilitate social interaction.

### Visual Resources

Visual resources within the project site and surrounding area are described in Section 6.4.3 of the Draft EIS.

### Environmental Enhancements

Important points of entry from the proposed Interstate Highway system to the street network would be enhanced as gateways. Gateway enhancements would be developed to create a distinct and identifiable sense of entry and sense of place. These enhancements include establishment of a consistent theme or motif, use of specialty materials and site elements, historical elements, landscaping, signage, aesthetic earth forms, and sculptural elements to mark the entrance to the city. Gateways have been identified at the new West Street and Genesee Street intersection, the Clinton Street exit and on Almond Street between the Adams and Harrison on and off ramps.

The West Street and Genesee Street Gateway would be achieved by the elimination of the elevated highway infrastructure, bringing West Street to surface, and the creation of a normalized intersection. Pedestrian, bicycle, and visual connectivity across West Street would be greatly enhanced. Aesthetic treatments would be used at this intersection to create a heightened sense of arrival into the city. Pedestrian areas at the intersections could be enlarged to accommodate more amenity and for visual impact. Sculptural lighting elements could serve as vertical markers, reinforcing a sense of arrival. Color could be used to enliven and punctuate the space. Sculptural sign walls, landscape and seat walls, and enhanced landscaping could all be used to define a gateway area. Specialty pavements and patterning could be utilized on sidewalks and interpretation on the history of the location could be incorporated into the pavements and plazas. Signage could orient visitors to the Creekwalk, Downtown and surrounding neighborhoods.

The removal of the highway infrastructure in this location also would allow for the creation of shared-use (bicycle and pedestrian) paths along the west side of Onondaga Creek and the creation of an overlook at the historic Erie Canal Aqueduct under Erie Boulevard. A historic canal theme that builds on the newly visible Erie Canal Aqueduct would provide the basis for the design vocabulary at this location. Canal themed materials could include rustic stone and wood, as well as other industrial themed materials. Consideration of existing Onondaga

Creekwalk elements, such as lighting, interpretive signage, furnishings, and pavement materials would be included to integrate with existing adjacent Onondaga Creekwalk segments north and south of the Project Area.

The Clinton Street Gateway is a gateway to the heart of the Downtown business district. Gateway enhancements would include landscape, low site walls, and aesthetic landforms just before passing under the elevated I-690. Other components of the gateway could include banners, lighting, and sculptural elements. Aesthetic enhancements to the I-690 Bridge would reinforce the sense of gateway and arrival. Gateway enhancements could be continued south to Herald Place on Clinton Avenue to further reinforce the gateway corridor experience and establish a rhythm of street trees and streetlights to transition to the city streets beyond the project limits.

Almond Street between the Adams Street and Harrison Street exits is a gateway district to Downtown and University Hill. Almond Street beneath the viaduct would be enhanced in this location to create a sense of gateway and arrival. This could include the use of specialty pavements, signage, and sculptural elements under the viaduct, as well as enhancements to the bridge architecture itself to create a distinct sense of place. Pedestrian areas at the intersections could incorporate similar amenities. Sculptural lighting elements could serve as vertical markers, reinforcing a sense of arrival.

The Northern Gateway along the northern segment of former I-81 would be achieved with landscape enhancements and aesthetic treatments to structures. Reconstructed bridges, abutments, and retaining walls would receive aesthetic treatments. Plantings along the highway would be provided to enhance the travel experience and create a sense of arrival.

## 5.6 ENGINEERING CONSIDERATIONS OF THE COMMUNITY GRID ALTERNATIVE

### OPERATIONS (TRAFFIC AND SAFETY) AND MAINTENANCE

#### Functional Classification and National Highway System (NHS)

Under the Community Grid Alternative, the Functional Classifications and NHS would not change for the majority of highways and streets. However, as shown in **Table 5-56**, the following changes are anticipated:

#### Control of Access

Access to the all sections of interstate within the Project Area would remain fully controlled. See HDM Section 2.6.15. In addition, access to the portion of former I-81, between the existing I-481 interchange and MLK. Jr., East, would remain fully controlled. Access to the various city and local streets within the Project Area would remain generally uncontrolled, but some amount of access control would be provided near ramp termini as described in **Table 5-57.**

**Table 5-56**
**Proposed Functional Classification**

| Roadway | Road Segment | Existing Functional Class | Proposed Functional Class |
|---|---|---|---|
| Irving Avenue | Van Buren St. to Genesee St. | Urban Minor Arterial | Urban Principal Arterial-Other |
| Irving Avenue | Genesee St. to Fayette St. | Urban Local | Urban Principal Arterial-Other |
| Irving Avenue | Fayette St. to I-690. | N/A (does not exist) | Urban Principal Arterial-Other |
| Crouse Avenue | Waverly Ave. to Genesee St. | Urban Major Collector | Urban Principal Arterial-Other |
| Crouse Avenue | Genesee St. to Burnet Ave. | Urban Major Collector(1) | Urban Principal Arterial-Other |
| Former I-81 | I-481 south interchange to MLK. Jr East | Urban Principal Arterial-Interstate | Urban Principal Arterial-Other |
| Former I-81(2) | MLK. Jr East to Burt St. | Urban Principal Arterial-Interstate | Urban Principal Arterial-Other |
| Almond Street | Burt St. to Adams St. | Urban Minor Arterial(3) | Urban Principal Arterial-Other |
| Almond Street | Erie Blvd. to Burnet Ave. | Urban Local | Urban Principal Arterial-Other |
| Renwick Ave | MLK Jr., East to Burt St. | Urban Major Collector(4) | N/A - Removed(5) |

**Notes:**

1. Current proposal by SMTC to change classification from Local to Major Collector is expected to be approved shortly.
2. The current elevated section of I-81 as well as Renwick Avenue between Martin Luther King East and Burt Street would be removed and replaced with an at grade arterial between Martin Luther King East and Burt Street.
3. Current proposal by SMTC to change classification from Local to Minor Arterial is expected to be approved shortly.
4. Current proposal by SMTC to change classification from Minor Arterial to Major Collector is expected to be approved shortly.
5. Renwick Avenue would be removed between Martin Luther King East and Burt Street and replaced with the at-grade arterial noted above.

**Table 5-57**
**Control of Access – Community Grid**

| Intersecting Feature | Type of Access | Address/Street | Existing Distance | Standard Distance | Proposed Distance | Action[1] |
|---|---|---|---|---|---|---|
| Butternut Street | Private Driveway | 215 Genant Dr. | N/A | N/A | N/A | Close[2] |
| Mainline Former I-81 | Private Driveway | 311 Genant Dr. | N/A | N/A | N/A | Close[3] |
| Mainline Former I-81 | Private Driveway | 431 Genant Dr. | N/A | N/A | N/A | Close[4] |
| Eastbound I-690 entrance ramp at Crouse Ave. | Public Street | Canal St | N/A | 50 ft | 100 ft | Maintain[5] |
| Eastbound I-690 entrance ramp at Crouse Ave. | Public Street | Erie Blvd | N/A | 100 ft | 40 ft | Maintain[6] |
| Westbound I-690 exit ramp at Crouse Ave. | Public Street | Burnet Ave | N/A | 100 ft | 50 ft | Maintain[7] |
| Southbound Former I-81 exit to E. Willow St. | Private Driveway | 123-29 Willow St | N/A | 100 ft | 70 ft | Maintain[8] |
| Southbound Former I-81 exit to E. Willow St. | Public Street | Warren St | N/A | 50 ft | 0 ft | Maintain[9] |
| Northbound Former I-81 Entrance | Private Driveway | 320 Pearl St. | N/A | 100 | 0 | Maintain[10] |
| Northbound Former I-81 entrance from Pearl St. | Driveway to State owned parking lot | Pearl Street | 0 ft | 100 ft | 130 ft | Relocate[11] |
| Eastbound I-690 Entrance | Private Driveway | 1001-1003 Erie Blvd | N/A | 100 ft | 0 ft | Close |
| Mainline Former I-81 | Private Driveway | 706-16 Clinton St | N/A | N/A | N/A | Close[12] |
| Southbound Former I-81 Exit to Spencer St. | Private Driveway | 800 Clinton St | N/A | 100 ft | 90 ft | Maintain[13] |

**Table 5-57**
**Control of Access – Community Grid**

| Intersecting Feature | Type of Access | Address/Street | Existing Distance | Standard Distance | Proposed Distance | Action[1] |
|---|---|---|---|---|---|---|
| Northbound Former I-81 exit ramp terminus at Sunset Ave. | Private Driveway | 220 Sunset Ave to 201 Danforth Ave | 0 | 100 | 0 | Maintain[14] |
| Northbound Former I-81 entrance ramp terminus at Sunset Ave | Private Driveway | 147 Court Street to 310 Sunset Ave | 0 | 100 | 0 | Maintain[15] |
| Southbound Former I-81 Entrance | Public Street | Bear Street | 80 | 100 ft | 0 ft | Maintain[16] |

**Notes:**
1. Refer to Non-Standard Feature Justification Forms in Appendix A-3 for all non-standard Control of Access locations recommended to be maintained.
2. Retaining wall will block driveway and require it to be relocated to Clinton St.
3. Two existing driveways to be removed and relocated to Clinton Street, due to the removal of Genant Drive.
4. Four existing driveways to be removed and relocated to Clinton Street, due to the removal of Genant Drive.
5. The existing Canal St./Crouse Ave intersection is opposite the proposed eastbound I-690 entrance ramp
6. The proposed westbound I-690 exit to Crouse Ave. is just south of the Crouse Ave. /Burnet Ave. intersection
7. The proposed eastbound I-690 entrance ramp from Crouse Ave. is just north of the Crouse Ave. /Erie Blvd. intersection
8. Existing driveway on north side of E. Willow St, is just west of the new southbound former I-81 exit to E. Willow.
9. Existing city street (Warren St.) is on the south side of E. Willow St, just west of the new southbound former I-81 exit to E. Willow.
10. A private drive for access to an alley between buildings is on the opposite side of Pearl St., across from the new ramp terminals.
11. Parking lot driveway owned by NYSDOT, will be relocated further north, opposite E. Belden Ave.
12. Two existing driveways will be removed as part of removal of Genant Drive. Access will be relocated to Clinton Street.
13. Private driveway on north side of Spencer St. just west of the new southbound I-81 exit to Spencer St.
14. Seven Driveways on north side of Sunset Avenue (opposite from the ramp terminal), belonging to multiple residences.
15. Four Driveways on north side of Sunset Avenue (opposite from the ramp terminal), belonging to multiple residences.
16. Entrance ramp to southbound I-81 splits from Genant Dr. just south of the Genant Dr. /Bear St. intersection.

## Traffic Control Devices

*Traffic Signals*

Under the Community Grid Alternative, the existing traffic signal at the intersection of Townsend Street and the westbound I-690 off-ramp would be removed, as the westbound I-690 off-ramp would be relocated to Crouse Avenue. Multiple intersections would be created or reconstructed to accommodate new approaches and lane configurations. To safely accommodate vehicle and pedestrian movements under the alternative, it would be necessary to install new traffic signals or replace existing traffic signal equipment that conforms to modified geometrics and phasing when appropriate.

New signalized intersections proposed under the Community Grid Alternative include:

- Almond Street at Burt Street
- Almond Street at Cedar Street
- Almond Street at Van Buren Street
- Almond Street and MLK. Jr., East
- Crouse Avenue at Madison Street
- Crouse Avenue at westbound I-690
- I-81 South Off-Ramp/Genant Drive at Spencer Street

- Irving Avenue at Erie Boulevard
- Irving Avenue at Madison Street
- Irving Avenue at Water Street
- Oswego Boulevard at Willow Street
- Pearl Street at James Street
- State Route (former I-81) at New Connecting Road (New Connector Road connects State Route to E. Brighton Avenue.
- Southbound former I-81 off-ramp at Willow Street
- West Street at eastbound I-690 ramps
- West Street at westbound I-690 ramps

Intersections which would receive traffic signal replacements under the Community Grid Alternative include:

- Almond Street at East Adams Street
- Almond Street at East Fayette Street
- Almond Street at East Washington Street
- Almond Street at East Water Street
- Almond Street at Harrison Street
- Almond Street at NY 92/East Genesee Street
- Almond Street/Catherine Street at NY 5/Erie Boulevard East
- Catherine Street at Burnet Avenue
- East Brighton at New Connecting Road
- Former I-81 South On-Ramp/Genant Drive at Bear Street
- Irving Avenue at E. Adams Street
- Irving Avenue at E. Fayette Street
- Irving Avenue at Harrison Street
- Irving Avenue at NY 92/E. Genesee Street
- Irving Avenue at Van Buren Street
- Montgomery Street at Harrison Street
- North Clinton Street at NY 5/W. Genesee Street
- North Crouse Avenue at Burnet Avenue
- North Franklin Street at NY 5/W. Genesee Street
- North Franklin Street/Butternut Street at North Franklin Street
- North State Street at Butternut Street

- North Warren Street at East Erie Boulevard
- North/South Crouse Avenue at Erie Boulevard East
- NY 5/Oswego Boulevard/ at Montgomery Street
- Oswego Blvd at James Street
- South Crouse Avenue at East Adams Street
- South Crouse Avenue at East Fayette Street
- South Crouse Avenue at East Water Street
- South Crouse Avenue at Harrison Street
- South Crouse Avenue at NY 92/East Genesee Street
- South McBride Street at East Adams Street
- South Salina Street at Harrison Street and Onondaga Street
- South Townsend Street at E. Adams Street
- South Townsend Street at Harrison Street
- South Warren Street at Harrison Street
- US 11/South State Street at East Adams Street
- US 11/South State Street at Harrison Street

Coordination between newly installed or replaced traffic signals would be established through the existing centrally controlled traffic signal communication system. Inductance loops disturbed by the Project would be replaced in kind. Pedestrian signals and push buttons would be included as part of the new signal system and pedestrian countdown timers would be provided at redesigned intersections where feasible.

*Signs*

New signs would be added where required and existing signs replaced as needed with new signs meeting current MUTCD standards. Signage would be installed to ensure motorists situate their vehicles in the appropriate lanes to complete desired maneuvers and to promote wayfinding to relocated interstate access points. Signs would be installed on standard posts needed to handle the necessary loading.

Under the Community Grid Alternative, re-signing along the interstate system would be extensive due to the de-designation of I-81 as an interstate through the city, re-designation of existing I-481 as the new I-81, and creation/removal/modification of a number of interchanges. In addition, extensive modifications to the city street system will require modification of existing and addition of new vehicular signing, as well as pedestrian/bicycle wayfinding signs.

**Pavement Markings**

New pavement markings would be installed within the project limits in accordance with MUTCD standards. Crosswalks would be installed at all crossing locations. Stop bars would be placed at all approaches to signalized intersections and all stop-controlled approaches at

unsignalized intersections. Lane striping and arrow markings would be provided to delineate the through and auxiliary turn lanes required to meet traffic operational requirements.

### Intelligent Transportation Systems (ITS)

The Regional Architecture used to plan and develop the current NYSDOT Region 3 ITS system was published in August 2002 and was based on the National ITS Architecture current at that time. The National ITS Architecture has been updated as Ver. 5 in 2003, Ver. 6 in 2007, and Ver. 7 in 2012 with additional updates in Version 7.1 published in 2015.

Changes to the National Architecture over this time have included new service packages for Security, maintenance services for infrastructure monitoring and Advanced Traffic Management services including roadside lighting control systems, variable speed limits, dynamic lane management and shoulder use, and dynamic roadway warning. Version 7.1 has also updated recommendations and terminology for connected vehicle services.

Under any build alternative, the NYSDOT Region 3 published vision represented by the Regional Architecture should be updated from the 2002 version to align with the current technologies for security, detection, communication, and data archiving that have emerged and matured since this Architecture was developed. The Community Grid Alternative represents the largest requirement for modification to the ITS system in Region 3 under this Project. Six camera locations and three VMS signs will need to be removed. Five CCTV and two VMS would replace that equipment. Additionally, the ITS equipment along I-481 should be upgraded to meet the increased AADT as that corridor is re-designated as the new I-81.

This alternative would also see the greatest benefit from an updated Regional Architecture to determine where new technologies and traffic management services will best match the goals of the Region.

The Community Grid Alternative should adjust and supplement the existing equipment prior to construction to provide ITS benefits to the work zone. The Community Grid Alternative would require more temporary CCTV cameras, portable VMS and vehicle sensors forming the Smart Work Zone equipment. This equipment is expected to be operated and maintained by the Contractor with access provided for NYSDOT and stakeholder agencies, implemented during construction wherever the roadway is left open to traffic to ensure incidents are minimized and addressed as quickly as possible.

### Speeds and Delay

*Speed and Travel Time Estimates*

Travel time and travel speed projections for the 2020 and 2050 Community Grid Alternative conditions were performed using the VISSIM models developed for the project. **Tables 5-58** and **5-59** present the estimated travel times, delay and speeds for each of 11 travel routes by direction during the AM and PM peak hours. Freeway speeds throughout the project area for the AM peak hour would range from 38 to 65 mph and from 37 to 63 mph in 2020 and 2050, respectively. For the PM peak hour, freeway speeds would range from 44 to 65 mph and from 44 to 63 mph in 2020 and 2050, respectively. 2020 and 2050 Community Grid travel speeds on the I-481 routes would be slightly higher than their corresponding No Build travel speeds. This is because that under the Community Grid Alternative, a new auxiliary

lane would be added to I-481 in each direction between Interchange 5 (Kirkville Road) and Interchange 4 (I-690), as well as to northbound I-481 between Interchange 5 (Kirkville Road) and Interchange 6 (I-90). Travel speeds on the former I-81 route (south of I-690) would be slower than No Build speeds because under the Community Grid Alternative, the section between the I-690 interchange and MLK. Jr., East would be replaced by an urban arterial and the section between MLK Jr., East and the southern I-81/I-481 interchange would be reclassified as a State Route. The state route would have a transitional posted speed to bring traffic speeds down from an expressway to a city street system.

Arterial speeds throughout the project area for the AM peak hour would range from 9 to 19 mph and from 10 to 17 mph in 2020 and 2050, respectively. For the PM peak hour, arterial travel speeds would range from 9 to 22 mph and from 9 to 20 mph in 2020 and 2050, respectively. Similar to the existing and No Build conditions, a vast majority of arterial routes under the 2020 and 2050 Community Grid traffic conditions could be characterized as low-speed routes because their travel speeds are less than 20 mph during one or more peak hours.

Travel times for key origin-destination pairs in Onondaga County were estimated using output from VISSIM traffic simulations, as well as the SMTC Regional Travel Demand Model. **Table 5-60** summarizes the average travel times for trips traveling between these origin-destination pairs during the AM and PM peak periods.

### Traffic Volumes

*Future Build Year Traffic Volumes*

Travel speeds on most routes were observed to be lower than the posted speed limits. Average travel speeds on the freeways throughout the project area range from approximately 50 to 63 miles-per-hour (mph) for the AM peak hour, and from 51 to 63 mph for the PM peak hour. For most freeway routes, the AM peak hour travel speeds are similar to the PM peak hour speeds. The I-481 travel routes have higher travel speeds than the I-81 and I-690 travel routes during both the AM and PM peak hours.

The results of the weaving analysis indicated that the following weave segments operate at unacceptable LOS during the AM or PM peak hour:

More detailed LOS analysis information (including overall intersection and approach LOS) for 260 intersections (along with their corresponding ID numbers) are included in  shows the overall intersection LOS for 98 of the 113 critical intersections. The remaining 15 intersections, while listed, are new or reconstructed under the Viaduct and Community Grid Alternatives. The operational conditions for these intersections are provided later in this chapter.

Under existing conditions, all 98 intersections operate acceptably at LOS D or better during the AM and PM peak hours. This implies that these intersections typically operate without substantial congestion and that reserve capacity exists.

**Table 5-58**
**2020 No Build and Community Grid Alternative Travel Time, Delay and Speeds**

| ID | Route | Direction | Travel Time (min) | | | | Travel Delay (min) | | | | Travel Speed (mph) | | | | Speed Limit | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NB | | CG | | NB | | CG | | NB | | CG | | NB | CG |
| | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | (mph) | (mph) |
| 1* | I-81 from Exit 17 to Exit 29N | NB | 13 | 14 | 19 | 19 | 2 | 3 | 6 | 6 | 45 | 46 | 45 | 46 | 55-65 | 30-65 |
| | | SB | 15 | 13 | 18 | 16 | 5 | 3 | 6 | 3 | 38 | 44 | 38 | 44 | 55-65 | 30-65 |
| 2 | I-481 from Exit 2 to Exit 8 | NB | 13 | 13 | 13 | 13 | 1 | 1 | 1 | 1 | 64 | 64 | 64 | 64 | 65 | 65 |
| | | SB | 13 | 13 | 13 | 13 | 1 | 1 | 1 | 1 | 65 | 65 | 65 | 65 | 65 | 65 |
| 3 | I-690 from Exit 8 to Exit 17 | EB | 9 | 9 | 9 | 9 | 1 | 1 | 1 | 1 | 54 | 56 | 54 | 56 | 55 | 55 |
| | | WB | 9 | 10 | 9 | 9 | 1 | 2 | 1 | 1 | 55 | 52 | 55 | 52 | 55 | 55 |
| 4 | Irving Avenue from Raynor Avenue to Fayette Street | NB | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 13 | 12 | 13 | 12 | 30 | 30 |
| | | SB | 4 | 6 | 3 | 3 | 3 | 5 | 2 | 2 | 15 | 14 | 15 | 14 | 30 | 30 |
| 5 | Almond Street from Van Buren Street to Burnet Avenue | NB | 5 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 14 | 14 | 14 | 14 | 30 | 30 |
| | | SB | 7 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 12 | 11 | 12 | 11 | 30 | 30 |
| 6 | State Street from Adams Street to Butternut Street | NB | 5 | 8 | 5 | 7 | 3 | 6 | 3 | 5 | 14 | 10 | 14 | 10 | 30 | 30 |
| 7 | Clinton Street from Websters Landing to Adams Street | SB | 3 | 5 | 4 | 5 | 2 | 3 | 3 | 3 | 13 | 10 | 13 | 10 | 30 | 30 |
| 8 | West Street from Adams Street to Genesee Street | NB | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 19 | 22 | 19 | 22 | 35 | 35 |
| | | SB | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 17 | 19 | 17 | 19 | 35 | 35 |
| 9 | Fayette Street from Walnut Avenue to West Street | EB | 6 | 6 | 7 | 6 | 3 | 4 | 4 | 4 | 12 | 12 | 12 | 12 | 30 | 30 |
| | | WB | 8 | 7 | 7 | 8 | 6 | 4 | 5 | 5 | 11 | 10 | 11 | 10 | 30 | 30 |
| 10 | Harrison Street from Comstock Avenue to West Street | WB | 7 | 7 | 7 | 8 | 5 | 5 | 4 | 5 | 13 | 11 | 13 | 11 | 30 | 30 |
| 11 | Adams Street from West Street to Comstock Avenue | EB | 8 | 8 | 10 | 9 | 6 | 6 | 7 | 7 | 8 | 8 | 12 | 11 | 30 | 30 |

*Via Almond Street under Community Grid

NB = No Build, CG = Community Grid

**Table 5-59**
**2050 No Build and Community Grid Alternative Travel Time, Delay and Speeds**

| ID | Route | Direction | Travel Time (min) | | | | Travel Delay (min) | | | | Travel Speed (mph) | | | | Speed Limit | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NB | | CG | | NB | | CG | | NB | | CG | | NB | CG |
| | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | (mph) | (mph) |
| 1* | I-81 from Exit 17 to Exit 29N | NB | 13 | 14 | 20 | 20 | 2 | 3 | 7 | 7 | 54 | 53 | 44 | 44 | 55-65 | 30-65 |
| | | SB | 18 | 13 | 19 | 16 | 8 | 3 | 6 | 3 | 38 | 52 | 37 | 44 | 55-65 | 30-65 |
| 2 | I-481 from Exit 2 to Exit 8 | NB | 13 | 13 | 13 | 13 | 1 | 1 | 1 | 1 | 63 | 63 | 63 | 62 | 65 | 65 |
| | | SB | 13 | 13 | 13 | 13 | 1 | 2 | 1 | 1 | 63 | 63 | 63 | 63 | 65 | 65 |
| 3 | I-690 from Exit 8 to Exit 17 | EB | 9 | 9 | 10 | 9 | 1 | 1 | 2 | 1 | 51 | 53 | 47 | 56 | 55 | 55 |
| | | WB | 9 | 10 | 9 | 9 | 1 | 2 | 1 | 1 | 54 | 50 | 55 | 51 | 55 | 55 |
| 4 | Irving Avenue from Raynor Avenue to Fayette Street | NB | 5 | 4 | 5 | 5 | 3 | 2 | 3 | 4 | 10 | 13 | 11 | 10 | 30 | 30 |
| | | SB | 4 | 5 | 4 | 4 | 3 | 3 | 3 | 2 | 12 | 11 | 13 | 13 | 30 | 30 |
| 5 | Almond Street from Van Buren Street to Burnet Avenue | NB | 4 | 5 | 4 | 4 | 2 | 3 | 3 | 3 | 15 | 12 | 13 | 13 | 30 | 30 |
| | | SB | 11 | 6 | 6 | 6 | 9 | 5 | 4 | 4 | 6 | 11 | 12 | 11 | 30 | 30 |
| 6 | State Street from Adams Street to Butternut Street | NB | 6 | 7 | 5 | 7 | 4 | 5 | 3 | 5 | 12 | 10 | 13 | 9 | 30 | 30 |
| 7 | Clinton Street from Websters Landing to Adams Street | SB | 3 | 4 | 3 | 4 | 2 | 2 | 2 | 3 | 14 | 13 | 15 | 11 | 30 | 30 |
| 8 | West Street from Adams Street to Genesee Street | NB | 2 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 21 | 17 | 17 | 20 | 35 | 35 |
| | | SB | 3 | 4 | 3 | 3 | 2 | 3 | 2 | 1 | 15 | 12 | 17 | 18 | 35 | 35 |
| 9 | Fayette Street from Walnut Avenue to West Street | EB | 6 | 6 | 7 | 6 | 4 | 4 | 4 | 4 | 13 | 12 | 12 | 12 | 30 | 30 |
| | | WB | 7 | 7 | 8 | 8 | 5 | 5 | 6 | 6 | 10 | 11 | 10 | 9 | 30 | 30 |
| 10 | Harrison Street from Comstock Avenue to West Street | WB | 7 | 9 | 7 | 8 | 5 | 6 | 4 | 5 | 12 | 10 | 13 | 11 | 30 | 30 |
| 11 | Adams Street from West Street to Comstock Avenue | EB | 8 | 8 | 8 | 8 | 5 | 5 | 5 | 5 | 11 | 12 | 12 | 11 | 30 | 30 |

*Via Almond Street under Community Grid
NB = No Build, CG = Community Grid

**Table 5-60**

**No Build and Community Grid Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak | | AM | | PM | | AM | | PM | |
| Origin | Destination | No Build | CG | No Build | CG | No Build | CG | No Build | CG |
| Baldwinsville | Cicero | 22 | 22 | 23 | 23 | 23 | 23 | 23 | 23 |
| | Destiny USA | 23 | 24 | 20 | 21 | 23 | 25 | 21 | 24 |
| | Downtown | 22 | 21 | 21 | 21 | 22 | 23 | 21 | 21 |
| | Fairmount | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| | Fayetteville/Manlius | 31 | 30 | 31 | 31 | 31 | 31 | 31 | 31 |
| | LaFayette | 33 | 35 | 31 | 35 | 33 | 36 | 32 | 36 |
| | Liverpool | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 |
| | St. Joseph's Hospital | 24 | 22 | 21 | 22 | 23 | 24 | 21 | 22 |
| | University Hill | 26 | 22 | 25 | 21 | 26 | 25 | 23 | 22 |
| Cicero | Baldwinsville | 21 | 21 | 23 | 23 | 21 | 21 | 23 | 23 |
| | Destiny USA | 13 | 12 | 11 | 12 | 13 | 11 | 11 | 11 |
| | Downtown | 17 | 14 | 14 | 13 | 17 | 13 | 16 | 14 |
| | Fairmount | 23 | 21 | 22 | 22 | 23 | 20 | 23 | 22 |
| | Fayetteville/Manlius | 19 | 18 | 19 | 19 | 18 | 17 | 19 | 18 |
| | LaFayette | 28 | 27 | 25 | 27 | 28 | 27 | 27 | 27 |
| | Liverpool | 13 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| | St. Joseph's Hospital | 17 | 13 | 13 | 12 | 17 | 13 | 16 | 14 |
| | University Hill | 21 | 16 | 18 | 15 | 21 | 17 | 19 | 16 |
| Destiny USA | Baldwinsville | 22 | 22 | 25 | 24 | 22 | 22 | 26 | 26 |
| | Cicero | 11 | 11 | 13 | 12 | 10 | 10 | 11 | 12 |
| | Downtown | 8 | 8 | 9 | 8 | 8 | 7 | 10 | 9 |
| | Fairmount | 11 | 11 | 14 | 13 | 11 | 11 | 15 | 15 |
| | Fayetteville/Manlius | 18 | 18 | 19 | 21 | 17 | 18 | 21 | 20 |
| | LaFayette | 21 | 22 | 20 | 24 | 19 | 23 | 21 | 25 |
| | Liverpool | 8 | 8 | 10 | 9 | 8 | 8 | 9 | 9 |
| | St. Joseph's Hospital | 7 | 7 | 8 | 7 | 7 | 8 | 8 | 8 |
| | University Hill | 13 | 10 | 13 | 10 | 12 | 12 | 13 | 11 |
| Downtown | Baldwinsville | 20 | 21 | 21 | 22 | 19 | 22 | 21 | 26 |
| | Cicero | 16 | 15 | 15 | 16 | 13 | 14 | 14 | 16 |
| | Destiny USA | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 7 |
| | Fairmount | 13 | 14 | 14 | 15 | 12 | 14 | 13 | 18 |
| | Fayetteville/Manlius | 16 | 17 | 17 | 20 | 15 | 16 | 16 | 19 |
| | LaFayette | 17 | 17 | 18 | 17 | 17 | 17 | 17 | 18 |
| | Liverpool | 10 | 9 | 10 | 10 | 8 | 9 | 9 | 11 |
| | St. Joseph's Hospital | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 5 |
| | University Hill | 7 | 7 | 8 | 7 | 7 | 7 | 7 | 7 |
| Fairmount | Baldwinsville | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 |
| | Cicero | 22 | 21 | 23 | 22 | 22 | 21 | 22 | 21 |
| | Destiny USA | 13 | 12 | 13 | 12 | 13 | 13 | 13 | 12 |

**Table 5-60**

**No Build and Community Grid Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak | | AM | | PM | | AM | | PM | |
| Origin | Destination | No Build | CG | No Build | CG | No Build | CG | No Build | CG |
| | Downtown | 13 | 13 | 13 | 13 | 13 | 15 | 13 | 13 |
| | Fayetteville/Manlius | 23 | 22 | 23 | 23 | 23 | 22 | 23 | 23 |
| | LaFayette | 23 | 27 | 23 | 27 | 25 | 28 | 24 | 28 |
| | Liverpool | 17 | 16 | 17 | 16 | 17 | 16 | 18 | 16 |
| | St. Joseph's Hospital | 16 | 14 | 13 | 14 | 14 | 15 | 13 | 14 |
| | University Hill | 17 | 14 | 16 | 13 | 17 | 16 | 15 | 14 |
| Fayetteville/ Manlius | Cicero | 28 | 28 | 29 | 29 | 28 | 27 | 30 | 32 |
| | Destiny USA | 17 | 17 | 17 | 18 | 16 | 16 | 17 | 17 |
| | Downtown | 13 | 14 | 14 | 13 | 13 | 13 | 14 | 14 |
| | Fairmount | 15 | 17 | 14 | 15 | 14 | 15 | 14 | 16 |
| | Fayetteville/Manlius | 21 | 21 | 22 | 22 | 20 | 20 | 22 | 24 |
| | LaFayette | 18 | 18 | 19 | 18 | 18 | 18 | 19 | 19 |
| | Liverpool | 17 | 18 | 18 | 18 | 17 | 17 | 18 | 18 |
| | St. Joseph's Hospital | 13 | 15 | 13 | 13 | 13 | 14 | 13 | 15 |
| | University Hill | 16 | 16 | 16 | 14 | 16 | 15 | 15 | 15 |
| LaFayette | Baldwinsville | 30 | 34 | 31 | 35 | 31 | 37 | 32 | 39 |
| | Destiny USA | 25 | 27 | 25 | 27 | 25 | 26 | 24 | 26 |
| | Downtown | 15 | 20 | 15 | 20 | 16 | 23 | 16 | 21 |
| | Fairmount | 16 | 18 | 16 | 17 | 17 | 20 | 16 | 17 |
| | Fayetteville/Manlius | 23 | 27 | 24 | 28 | 23 | 30 | 24 | 31 |
| | LaFayette | 18 | 17 | 18 | 18 | 18 | 18 | 18 | 18 |
| | Liverpool | 19 | 23 | 20 | 24 | 20 | 27 | 20 | 25 |
| | St. Joseph's Hospital | 17 | 19 | 18 | 18 | 19 | 22 | 16 | 18 |
| | University Hill | 15 | 16 | 15 | 14 | 17 | 18 | 15 | 15 |
| Liverpool | Baldwinsville | 13 | 13 | 15 | 15 | 14 | 14 | 14 | 14 |
| | Cicero | 14 | 14 | 15 | 15 | 13 | 13 | 14 | 14 |
| | Downtown | 7 | 8 | 6 | 8 | 6 | 8 | 7 | 10 |
| | Fairmount | 11 | 8 | 9 | 8 | 10 | 8 | 12 | 10 |
| | Fayetteville/Manlius | 16 | 15 | 17 | 17 | 16 | 16 | 19 | 17 |
| | LaFayette | 21 | 19 | 20 | 21 | 20 | 19 | 22 | 21 |
| | Liverpool | 24 | 23 | 20 | 24 | 22 | 24 | 23 | 26 |
| | St. Joseph's Hospital | 11 | 8 | 8 | 7 | 10 | 9 | 11 | 9 |
| | University Hill | 17 | 12 | 13 | 10 | 14 | 12 | 15 | 12 |
| St. Joseph's Hospital | Baldwinsville | 21 | 21 | 21 | 22 | 20 | 21 | 23 | 24 |
| | Cicero | 13 | 13 | 13 | 14 | 12 | 12 | 12 | 14 |
| | Destiny USA | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 4 |
| | Fairmount | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 5 |
| | Fayetteville/Manlius | 14 | 14 | 14 | 15 | 13 | 14 | 15 | 16 |
| | LaFayette | 14 | 16 | 16 | 19 | 14 | 15 | 15 | 19 |

**Table 5-60**

**No Build and Community Grid Origin-Destination Travel Times (Minutes)**

| Year | | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak | | AM | | PM | | AM | | PM | |
| Origin | Destination | No Build | CG | No Build | CG | No Build | CG | No Build | CG |
| | Liverpool | 18 | 18 | 18 | 20 | 18 | 19 | 18 | 21 |
| | St. Joseph's Hospital | 7 | 7 | 8 | 8 | 7 | 7 | 8 | 9 |
| | University Hill | 7 | 7 | 8 | 7 | 7 | 8 | 7 | 9 |
| University Hill | Baldwinsville | 21 | 20 | 24 | 22 | 21 | 21 | 24 | 26 |
| | Cicero | 16 | 16 | 18 | 17 | 15 | 15 | 16 | 17 |
| | Destiny USA | 7 | 6 | 8 | 7 | 7 | 7 | 7 | 8 |
| | Downtown | 6 | 7 | 7 | 6 | 6 | 6 | 6 | 6 |
| | Fayetteville/Manlius | 14 | 13 | 17 | 15 | 14 | 14 | 15 | 18 |
| | LaFayette | 15 | 14 | 17 | 18 | 15 | 14 | 17 | 16 |
| | Liverpool | 16 | 14 | 18 | 16 | 16 | 16 | 16 | 17 |
| | St. Joseph's Hospital | 10 | 10 | 12 | 11 | 10 | 11 | 11 | 12 |
| | University Hill | 7 | 6 | 7 | 6 | 7 | 6 | 6 | 6 |

LOS for ramp operations is based on the density of vehicles within the influence areas on the mainline created by merging and diverging vehicles. In comparison to existing conditions, the number of ramps that would operate at an unacceptable LOS increases in 2020 and 2050 due to the anticipated growth in traffic flows.

Note that the ramp diverge area for westbound I-690 to Townsend Street (Exit 13) in the AM peak hour would improve from LOS F to LOS D between 2020 and 2050. This would occur because that the signal timing at the intersection of Brown Street and Townsend Streets was adjusted in 2050 to increase the green time for the dual left turn lanes on the westbound ramp approach, which would prevent spillback onto the interstate. Similar signal timing adjustments were made elsewhere to account for the City's planned project to convert streets from one-way to two-way operation and optimize signal timing at many intersections.

The results of the weaving analysis indicate that in comparison to the existing condition, one additional weaving section would operate at LOS E or worse in the No Build condition. The weaving sections expected to operate at LOS E or F in 2020 and 2050 include:

A future Build year condition represents a future-year growth scenario, including all planned/committed transportation projects that are included in the No Build, as well as the I-81 Viaduct Project alternatives. Two future Build years were analyzed - the ETC year 2020 and design year 2050. The primary tool used for estimating future Build year traffic volumes is the SMTC regional travel demand model developed by the Syracuse Metropolitan Transportation Council (SMTC). The SMTC model predicts traffic volumes as a result of the anticipated changes in land use, population, economic activity, and transportation system. AM and PM peak hour traffic volumes were forecasted separately for the 2020 and 2050 Build years.

A future Build year condition represents a future-year growth scenario, including all planned/committed transportation projects that are included in the No Build, as well as the I-81 Viaduct Project alternatives. Two future Build years were analyzed - the ETC year 2020 and design year 2050. The primary tool used for estimating future Build year traffic volumes is the SMTC regional travel demand model developed by the Syracuse Metropolitan Transportation Council (SMTC). The SMTC model predicts traffic volumes as a result of the anticipated changes in land use, population, economic activity, and transportation system. AM and PM peak hour traffic volumes were forecasted separately for the 2020 and 2050 Build years.

The Community Grid Alternative would establish former I-481 as the quickest path for regional north-south travel through the project area. As a result, traffic would increase substantially on former I-481 both north and south of I-690 and decrease on the southern spur of former I-81 (north of the Colvin Street interchange).

Projected future Build traffic volumes under the Community Grid Alternative for the 2020 and 2050 analysis years and for the AM and PM peak hours are located in **Appendix C-3** for all interstate segments, ramp connections, and intersection turning movements. **Table 5-61** shows the weekday AM and PM peak hour traffic volumes for key segments on freeways and several local roadways in the project area.

Generally, traffic volume increases under the Community Grid Alternative would be fairly uniform and modest when comparing Build year 2050 to 2020, and the evening peak would exceed the morning peak in terms of overall traffic in both years.

Traffic would increase on I-690 west of the West Street interchange. This is due to the nearby interconnect ramps, from southbound former I-81 to westbound I-690 and from eastbound I-690 to northbound former I-81, which would be provided under the Community Grid Alternative and do not exist in the No Build condition. These new interconnect ramps would attract traffic onto the interstate segments west and north of the main I-81/I-690 interchange. Traffic using the new interconnect ramps would be removed from local streets and parallel routes west of Onondaga Lake.

Under the Community Grid Alternative, the southbound former I-81 exit to Butternut Street and the slip-ramp to Salina Street would not be provided. Traffic exiting southbound former I-81 towards downtown is consolidated onto Clinton Street and traffic would increase along the arterial. Traffic would decrease on westbound Harrison Street and eastbound Adams Street, due removal of the elevated former I-81 and associated ramps in their vicinity. Traffic would increase on sections of Almond Street north of former Harrison/Adams Street interchange because Almond Street would accommodate some through traffic which would be on the elevated former I-81 in the No Build condition. Traffic would increase on eastbound Harrison Street (east of Almond Street) because the portion of Harrison Street (west of Almond Street) would converted to two-way operation under the Community Grid Alternative, allowing eastbound travel further west and improving network connectivity to the eastbound lanes on Harrison Street. Traffic would increase on Crouse and Irving Avenues, as these routes would be established as direct routes between University Hill and the new I-690 interchange at Crouse and Irving Avenues.

**Table 5-61**
**2020 and 2050 Community Grid Alternative Traffic Volumes at Key Locations**

| Location | Direc-tion | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | No Build | CG | No Build | CG | No Build | CG | No Build | CG |
| I-81 Just North of Colvin Street Interchange (Former I-81 for Community Grid) | NB | 2,928 | 1,425 | 2,913 | 1,088 | 3,223 | 1,642 | 3,044 | 1,141 |
| | SB | 2,322 | 618 | 3,457 | 1,638 | 2,442 | 603 | 3,748 | 1,876 |
| I-81 Just South of Court/ Spencer Street Interchange (Former I-81 for Community Grid) | NB | 2,439 | 2,952 | 5,843 | 5,990 | 2,637 | 3,147 | 6,209 | 6,532 |
| | SB | 5,161 | 4,401 | 3,466 | 3,413 | 5,582 | 4,935 | 3,752 | 3,723 |
| I-481 Just South of I-690 Interchange (New I-81 for Community Grid) | NB | 3,424 | 4,257 | 2,739 | 3,651 | 3,668 | 4,588 | 2,906 | 3,878 |
| | SB | 1,995 | 2,937 | 3,501 | 4,555 | 2,206 | 3,232 | 3,746 | 4,858 |
| I-481 Just North of I-690 Interchange (New I-81 for Community Grid) | NB | 2,262 | 2,553 | 2,971 | 3,301 | 2,503 | 2,783 | 3,209 | 3,528 |
| | SB | 2,692 | 3,144 | 2,415 | 2,949 | 3,036 | 3,462 | 2,747 | 3,310 |
| I-690 Just West of West Street Interchange | EB | 4,432 | 5,122 | 2,499 | 3,638 | 4,794 | 5,507 | 2,751 | 3,968 |
| | WB | 1,938 | 2,526 | 3,952 | 4,554 | 2,142 | 2,781 | 4,308 | 4,874 |
| I-690 Just East of Teall Avenue Interchange | EB | 3,545 | 3,374 | 4,708 | 4,521 | 3,672 | 3,526 | 4,877 | 4,724 |
| | WB | 3,902 | 3,923 | 3,867 | 3,999 | 4,198 | 4,271 | 3,989 | 4,210 |
| West Street Just South of Fayette Street | NB | 486 | 567 | 818 | 918 | 430 | 538 | 768 | 988 |
| | SB | 1,004 | 992 | 643 | 595 | 1,062 | 1,043 | 685 | 620 |
| Clinton Street Just North of Onondaga Street | NB | -- | -- | -- | -- | 192 | -- | 260 | -- |
| | SB | 537 | 765 | 474 | 681 | 410 | 803 | 321 | 701 |
| Salina Street Just North of Onondaga Street | NB | 313 | 391 | 412 | 516 | 277 | 384 | 429 | 551 |
| | SB | 356 | 527 | 278 | 386 | 431 | 557 | 363 | 418 |
| State Street Just North of Harrison Street | NB | 164 | 364 | 231 | 510 | 150 | 276 | 273 | 452 |
| | SB | 368 | 502 | 317 | 374 | 421 | 558 | 323 | 400 |
| Almond Street Just North of Harrison Street | NB | 698 | 999 | 510 | 1,477 | 728 | 1,066 | 508 | 1,511 |
| | SB | 1,503 | 1,005 | 986 | 807 | 1,561 | 1,123 | 1,139 | 925 |
| Irving Avenue Just North of Harrison Street | NB | 118 | 162 | 270 | 513 | 137 | 226 | 312 | 542 |
| | SB | 545 | 745 | 351 | 361 | 622 | 762 | 384 | 408 |
| Crouse Avenue Just North of Harrison Street | NB | 175 | 272 | 376 | 622 | 171 | 312 | 364 | 712 |
| | SB | -- | 298 | -- | 150 | -- | 314 | -- | 192 |
| Erie Boulevard Just East of Almond Street | EB | 356 | 507 | 351 | 906 | 410 | 474 | 392 | 972 |
| | WB | 269 | 557 | 388 | 473 | 307 | 671 | 439 | 519 |
| Fayette Street Just East of Almond Street | EB | 271 | 224 | 154 | 268 | 280 | 222 | 181 | 286 |
| | WB | 149 | 235 | 289 | 285 | 154 | 254 | 292 | 293 |
| Genesee Street Just East of Almond Street | EB | 351 | 360 | 453 | 583 | 363 | 366 | 470 | 603 |
| | WB | 362 | 284 | 365 | 208 | 379 | 300 | 428 | 216 |
| Harrison Street Just East of Almond Street | EB | 48 | 340 | 53 | 237 | 110 | 473 | 77 | 289 |
| | WB | 825 | 528 | 1,622 | 1,077 | 902 | 597 | 1,834 | 1,108 |
| Adams Street Just East of Almond Street | EB | 1,705 | 746 | 803 | 546 | 1,827 | 847 | 946 | 552 |

**Note:** AADT is the Average Annual Daily Traffic.

## Level of Service and Mobility

*At Project Completion & Design Year*

*Future Community Grid Level of Service: Freeway Level of Service*

Based on VISSIM delay calculation, Projected future Community Grid Alternative freeway levels of service (LOS) were calculated for all the basic freeway segments, freeway ramps, and weaving segments within the Project Area - (see **Appendix C-3**). **Table 5-62** shows 2020 and 2050 freeway LOS conditions resulting from the Community Grid Alternative traffic on selected critical sections of I-81, I-481, and I-690. Since the Community Grid Alternative would correct most non-standard and non-conforming highway features within the I-81 Project Area, and make improvements at existing/No Build locations identified as congested, it would substantially improve traffic operational conditions on the interstate system during the AM and PM peak hours. In comparison to 2020 and 2050 No Build Alternative LOS results, the numbers of freeway segments, ramp junctions, and weaving sections operating unacceptably would be reduced by 96 and 76 percent, respectively, under Community Grid Alternative traffic conditions.

Freeway segments that would operate at unacceptable LOS (i.e., LOS E or LOS F) include:

- Northbound former I-81 between Exit 29S (southbound former I-481) and the southbound NY 481 on-ramp (2050 PM peak hour)

Ramp merge areas that would operate at unacceptable LOS include:

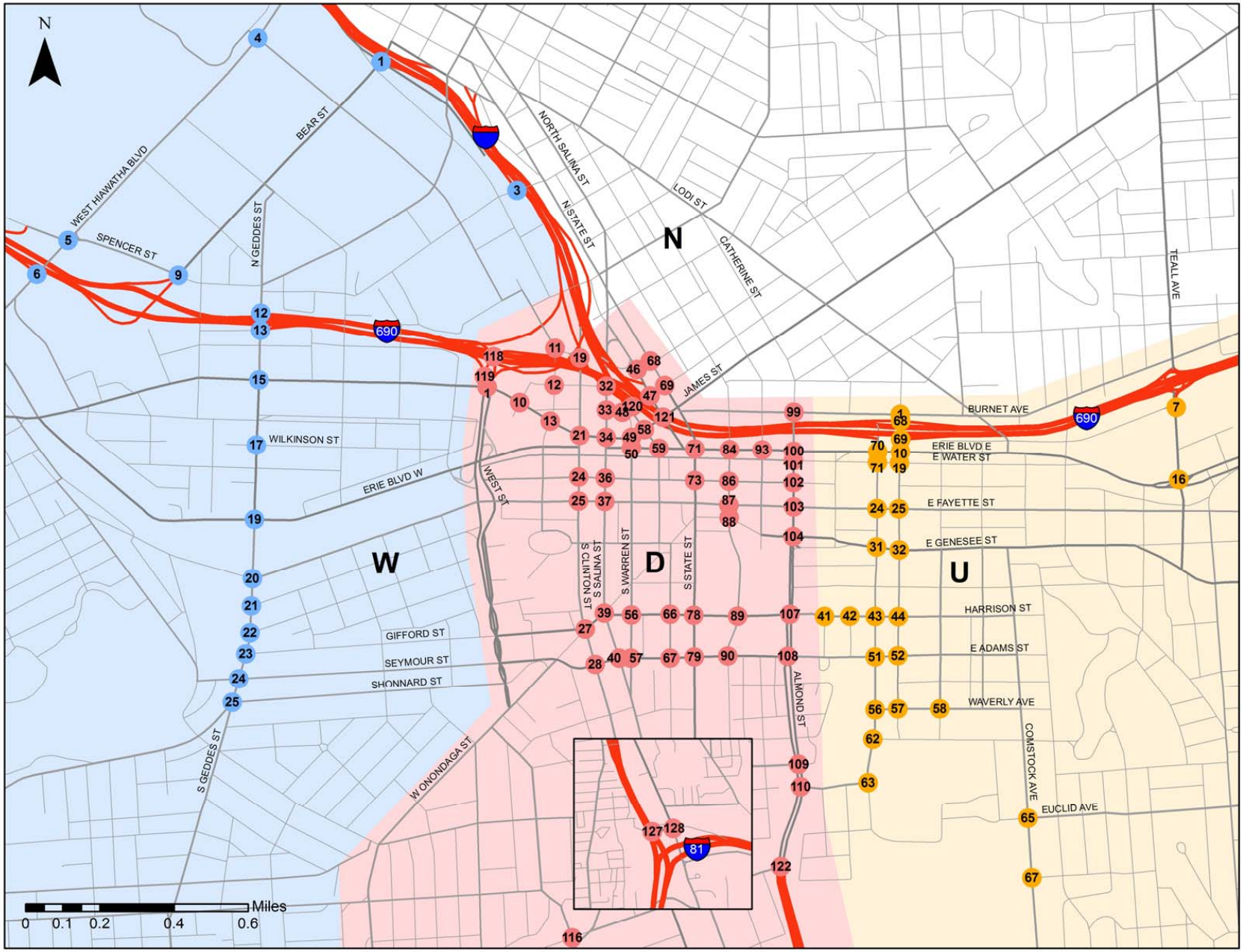
- Eastbound I-690 at the Interchange 10 (N. Geddes St) on-ramp (2050 AM peak hour)
- Westbound I-690 at the Interchange 9 (Bear Street) on-ramp (2050 PM peak hour)

Weaving sections that would operate at unacceptable LOS include:

- Northbound former I-81 between the Interchange 29N (NY 481) on and off-ramps (2050 PM peak hour)
- Southbound former I-481 between the Interchange 3W (NY 5 West) on-ramp and Exit 3E (NY 5 East) (2020/2050 PM peak hours)
- Westbound I-690 between the Interchange 11 (West St) on-ramp and Exit 10 (N. Geddes St) (2050 PM peak hour)
- All the ramp diverge areas would operate at LOS D or better in 2020 and 2050.
- Future Community Grid Level of Service: Intersection Level of Service

Based on VISSIM delay calculation, **Table 5-63** summarizes the LOS for the 2020 and 2050 Community Grid Alternative for selected signalized and unsignalized intersections during the weekday AM and PM peak hours (More detailed LOS analyses for 260 intersections are included in **Appendix C-3**). Refer to **Figure 5-15** for a reference map of intersection locations under the Community Grid Alternative. Note that the table contains 102 intersections because the Community Grid Alternative would eliminate some intersections from the existing/No Build conditions and add new intersections in the Project Area. Of the 102 intersections, five and eight intersections would operate at unacceptable levels (LOS E or LOS F) during the 2020 AM and PM peak hours, respectively; four and fourteen

12.21.16




Community Grid Alternative Intersection Locations

**I-81 Viaduct Project**

**Figure 5-15**

intersections would operate at saturated levels during the 2050 AM and PM peak hours, respectively.

**Table 5-62**
**2020 and 2050 Community Grid Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| **Northbound Former I-81** | | | | | | | | | |
| between Interchange 16A (former I-481 North) off-ramp and newly created intersection | BFS | 5.2 | A | 4.0 | A | 6.2 | A | 4.3 | A |
| between the newly created intersection and S. Salina St off-ramp | BFS | 5.8 | A | 4.8 | A | 7.6 | A | 5.4 | A |
| between Interchange 17 (S. Salina St) on-ramp and E. Colvin St on-ramp | BFS | 7.7 | A | 5.6 | A | 33.0 | D | 6.0 | A |
| between Interchange 22 (Court St) off and on-ramps | BFS | 10.8 | A | 24.4 | C | 11.6 | B | 27.1 | D |
| between Interchange 23 (Park St, Hiawatha Blvd) off and on-ramps | BFS | 10.3 | A | 21.8 | C | 10.9 | A | 24.0 | C |
| between Interchange 23 (Hiawatha Blvd) on-ramp and Exit 25 (7th North St) | BFS | 9.0 | A | 19.0 | C | 9.8 | A | 21.0 | C |
| between Exit 29S (former I-481 SB) and Southbound NY 481 on-ramp | BFS | 8.7 | A | 21.9 | C | 9.4 | A | 38.0 | E |
| between Exit 29N (NY 481 NB) and Northbound former I-481 on-ramp1 | BFS | 6.5 | A | 16.1 | B | 6.5 | A | 19.0 | C |
| between Exit 29N (NY 481 NB) and Northbound former I-481 on-ramp2 | BFS | 8.8 | A | 19.1 | B | 8.8 | A | 21.9 | C |
| at Exit 16A (former I-481 North) | Diverge | 5.7 | A | 4.5 | A | 7.3 | A | 5.0 | A |
| at Exit 17 (S. Salina St, Brighton Av) to E Brighton St | Diverge | 3.7 | A | 3.4 | A | 5.1 | A | 4.1 | A |
| at Exit 23 (Hiawatha Blvd) to Hiawatha Blvd W | Diverge | 9.7 | A | 15.4 | B | 8.7 | A | 15.9 | B |
| at Exit 29S (former I-481 South) | Diverge | 9.3 | A | 18.6 | B | 10.0 | A | 20.5 | C |
| at Interchange 17 (E. Colvin St) on-ramp | Merge | 9.1 | A | 7.1 | A | 21.1 | C | 7.6 | A |
| at Interchange 19 (N. Salina St, Pearl St) on-ramp | Merge | 8.2 | A | 22.4 | B | 8.4 | A | 24.9 | C |
| at Interchange 22 (Court St) on-ramp | Merge | 14.1 | B | 22.3 | C | 12.2 | B | 23.1 | C |
| at Interchange 23 (Hiawatha Blvd) on-ramp | Merge | 12.3 | B | 24.2 | C | 13.3 | B | 26.4 | C |
| at Interchange 29S (former I-481) on-ramp | Merge | 7.0 | A | 12.8 | B | 7.4 | A | 13.7 | B |
| between I-690 EB on-ramp and Court St off-ramp | Weave | 7.7 | A | 18.0 | B | 12.7 | B | 24.1 | C |
| between Interchange 29N (NY 481) on and off-ramps | Weave | 6.8 | A | 24.1 | C | 7.1 | A | 66.6 | F |
| **Southbound Former I-81** | | | | | | | | | |
| between Interchange 30 (NY 31) on-ramp and Exit 29N (NY 481) | BFS | 19.9 | B | 10.9 | B | 22.1 | C | 12.5 | B |
| between Southbound former I-81 new off-ramp (to SB former I-481) and Exit 29N | BFS | 22.0 | C | 12.1 | B | 26.0 | D | 13.4 | B |
| between Northbound NY 481 off-ramp and former northbound I-481 on-ramp | BFS | 20.2 | C | 10.7 | B | 23.3 | C | 12.1 | B |
| between Interchange 29S (former I-481) on and southbound NY 481 on-ramp | BFS | 14.8 | B | 8.4 | A | 17.3 | B | 9.3 | A |
| between Exits 23A (Hiawatha Blvd) and Old Liverpool Rd on-ramp | BFS | 23.8 | C | 16.4 | B | 25.9 | C | 17.1 | B |
| between Old Liverpool Rd./NY 370 and Interchange 21 (Bear St) on-ramps | BFS | 20.5 | C | 14.5 | B | 23.2 | C | 16.4 | B |
| between Spencer St/Catawba St) off- ramp and WB/EB off-ramp | BFS | 22.3 | C | 15.2 | B | 23.5 | C | 20.8 | C |
| between Clinton St off- ramp and Oswego Blvd off-ramp | BFS | 7.7 | A | 3.5 | A | 11.8 | B | 6.5 | A |
| between Castle Intersection and Exit 17 (S. Salina St, Brighton Av) off-ramp | BFS | 4.7 | A | 10.2 | A | 3.5 | A | 11.9 | B |
| between Interchange 16A (former I-481) off and on-ramps | BFS | 3.1 | A | 8.1 | A | 2.5 | A | 6.1 | A |
| at Exit to Southbound former I-81 | Diverge | 20.0 | C | 8.0 | A | 23.5 | C | 11.5 | B |

**Table 5-62**
**2020 and 2050 Community Grid Alternative Freeway LOS Analysis**

| Segment | Type | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS |
| at Exit 29N (Northbound NY 481) | Diverge | 14.5 | B | 8.2 | A | 16.7 | B | 9.0 | A |
| at Exit to Eastbound and Westbound I-690 | Diverge | 21.0 | C | 13.4 | B | 18.7 | C | 26.7 | C |
| at Exit 19 (Clinton St) | Diverge | 18.5 | B | 12.9 | B | 24.3 | C | 7.9 | A |
| at Exit 17 (S. Salina St, Brighton Av) | Diverge | 4.2 | A | 7.7 | A | 3.3 | A | 8.3 | A |
| at Exit to newly created intersection to NB former I-481 | Diverge | 3.5 | A | 8.3 | A | 2.4 | A | 5.8 | A |
| at Interchange 29N (NY 481) on-ramp | Merge | 14.8 | B | 8.9 | A | 17.4 | B | 9.1 | A |
| at Interchange 29S (NY 481) on-ramp | Merge | 22.7 | C | 13.6 | B | 25.1 | C | 14.5 | B |
| at Old Liverpool Rd./NY 370 on-ramp | Merge | 25.8 | C | 19.0 | B | 28.6 | D | 20.3 | C |
| at Brighton Ave on-ramp | Merge | 5.4 | A | 8.7 | A | 5.3 | A | 8 | A |
| at Interchange 16A (former I-481) on-ramp | Merge | 2.7 | A | 6.3 | A | 2.2 | A | 5.0 | A |
| between Bear St on-ramp and Spencer/Catawba St off-ramp | Weave | 24.7 | C | 9.5 | A | 20.8 | C | 16.0 | B |
| **Northbound Former I-481** | | | | | | | | | |
| between Interchange 1 (Brighton Av, Rock Cut Rd) off and on-ramps | BFS | 8.2 | A | 7.3 | A | 9.5 | A | 8.9 | A |
| between Interchange 3E (East NY 5 ) off and on-ramps | BFS | 20.4 | C | 18.2 | C | 22.3 | C | 19.5 | C |
| between Interchange 3W (West NY 5 ) off and on-ramps | BFS | 20.4 | C | 19.3 | C | 22.0 | C | 20.7 | C |
| between Interchange 3W (West NY 5 ) on-ramp and Exit 4 (West I-690 ) | BFS | 25.0 | C | 20.8 | C | 26.7 | D | 21.8 | C |
| between Interchange 4 (West I-690 ) off and on-ramps | BFS | 14.9 | B | 16.0 | B | 16.6 | B | 17.2 | B |
| between Interchange 4 (East I-690) on-ramp and Exit 5E (Kirkville Rd) | BFS | 13.9 | B | 18.2 | C | 15.4 | B | 19.3 | C |
| between Interchange 5E (Kirkville Rd) off and on-ramps | BFS | 19.6 | C | 23.4 | C | 21.1 | C | 24.3 | C |
| between Interchange 5W (Kirkville Rd) off and on-ramps | BFS | 15.0 | B | 22.6 | C | 16.2 | B | 24.0 | C |
| between Interchange 5W (Kirkville Rd) on-ramp and Exit 6 (I-90) | BFS | 11.1 | B | 16.1 | B | 12.2 | B | 17.5 | B |
| between Interchange 9S (former I-81) off and on-ramps | BFS | 10.4 | A | 28.4 | D | 10.8 | A | 31.0 | D |
| between split to former I-481 mainline and NB former I-81 on-ramp | BFS | 4.7 | A | 10.7 | A | 5.7 | A | 8.6 | A |
| at Exit 3E (East NY 5 ) | Diverge | 15.4 | B | 13.7 | B | 16.7 | B | 14.5 | B |
| at Exit 4 (West I-690 ) | Diverge | 19.3 | B | 17.3 | B | 20.7 | C | 18.3 | B |
| at Exit 5E (Kirkville Rd) | Diverge | 14.2 | B | 19.8 | B | 15.3 | B | 21.0 | C |
| at Exit 6 (I-90) | Diverge | 11.1 | B | 16.8 | B | 12.1 | B | 18.2 | B |
| at Exit to former Northbound I-481 | Diverge | 7.0 | A | 17.4 | B | 7.6 | A | 25.3 | C |
| at Interchange 3W (West NY 5 ) on-ramp | Merge | 21.1 | C | 19.1 | B | 23.7 | C | 20.1 | C |
| at Interchange 4 (East I-690) on-ramp | Merge | 14.3 | B | 19.4 | B | 15.9 | B | 20.6 | C |
| at Interchange 5W (Kirkville Rd) on-ramp | Merge | 11.2 | B | 15.8 | B | 12.2 | B | 17.4 | B |
| at Interchange 9N (former I-81) on-ramp | Merge | 7.9 | A | 19.8 | B | 8.1 | A | 21.4 | C |
| between Interchange 3E (East NY 5 ) on-ramp and Exit 3W (West NY 5 ) | Weave | 15.8 | B | 14.9 | B | 17.0 | B | 16.0 | B |
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 5W (Kirkville Rd) | Weave | 14.5 | B | 18.1 | B | 14.1 | B | 19.3 | B |
| between Interchange 9N (former I-81) on-ramp and Exit 9S (former I-81) | Weave | 8.4 | A | 21.3 | C | 9.1 | A | 23.6 | C |
| **Southbound Former I-481** | | | | | | | | | |
| between Southbound former I-81 off-ramp and northbound former I-81 off-ramp | BFS | 18.2 | C | 8.5 | A | 19.7 | C | 12.6 | B |

**Table 5-62**
**2020 and 2050 Community Grid Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| between Interchange 9N (former I-81) off and on-ramps | BFS | 18.2 | C | 8.0 | A | 20.5 | C | 11.8 | B |
| between Interchange 9N (Northbound former I-81) on-ramp and Southbound former I-81 on-ramp | BFS | 14.5 | B | 10.9 | A | 17.3 | B | 7.7 | A |
| between Interchange 6 (I-90) on-ramp and Exit 5W (Kirkville Rd) | BFS | 24.4 | C | 22.0 | C | 27.6 | D | 24.4 | C |
| between Interchange 5W (Kirkville Rd) off and on-ramps | BFS | 16.9 | B | 13.7 | B | 19.3 | C | 15.5 | B |
| between Interchange 5E (Kirkville Rd) off and on-ramps | BFS | 22.6 | C | 19.4 | C | 25.3 | C | 22.3 | C |
| between Interchange 5E (Kirkville Rd) on-ramp and Exit 4 (West I-690 ) | BFS | 17.4 | B | 16.3 | B | 19.2 | C | 18.4 | C |
| between Interchange 4 (East I-690) on-ramp | BFS | 14.3 | B | 16.9 | B | 15.7 | B | 19.1 | C |
| between Interchange 4 (East I-690) on-ramp and Exit 3W (West NY 5 ) | BFS | 16.4 | B | 27.1 | D | 17.9 | B | 27.9 | D |
| between Interchange 3W (West NY 5 ) off and on-ramps | BFS | 15.1 | B | 24.5 | C | 16.4 | B | 29.8 | D |
| between Interchange 3E (East NY 5 ) off and on-ramps | BFS | 11.8 | B | 14.4 | B | 13.2 | B | 15.1 | B |
| between Interchange 3E (East NY 5 ) on-ramp and Exit 2 (Jamesville Rd) | BFS | 12.2 | B | 15.7 | B | 13.6 | B | 16.5 | B |
| between Exit 1 (Brighton Av) and SB former I-81 merge | BFS | 7.2 | A | 8.6 | A | 7.9 | A | 9.2 | A |
| at Exit 9N (former I-81) | Diverge | 12.4 | B | 5.8 | A | 14.0 | B | 8.6 | A |
| at Exit 9S (former I-81) | Diverge | 27.3 | C | 11.4 | B | 30.3 | D | 16.6 | B |
| at Exit 6 (I-90) | Diverge | 15.0 | B | 15.1 | B | 17.3 | B | 17.2 | B |
| at Exit 5W (Kirkville Rd) | Diverge | 16.1 | B | 14.2 | B | 18.4 | B | 15.9 | B |
| at Exit 4 (West I-690) | Diverge | 18.1 | B | 16.6 | B | 20.2 | C | 18.7 | B |
| at Exit 3W (West NY 5 ) | Diverge | 14.1 | B | 23.3 | C | 15.3 | B | 26.1 | C |
| at Exit 1 (Brighton Av) | Diverge | 11.1 | B | 12.5 | B | 13.2 | B | 13.2 | B |
| at Interchange 9N (former I-81) on-ramp | Merge | 11.5 | B | 7.8 | A | 14.4 | B | 8.6 | A |
| at Southbound former I-81 on- ramp | Merge | 13.1 | B | 8.7 | A | 18.1 | B | 11.4 | B |
| at Interchange 6 (I-90) on-ramp | Merge | 17.2 | B | 15.9 | B | 19.8 | B | 17.5 | B |
| at Interchange 5E (Kirkville Rd) on-ramp | Merge | 17.7 | B | 17.0 | B | 19.6 | B | 19.1 | B |
| at Interchange 4 (East I-690) on-ramp | Merge | 15.4 | B | 27.2 | C | 16.6 | B | 28.0 | C |
| at Interchange 3E (East NY 5 ) on-ramp | Merge | 11.6 | B | 14.5 | B | 12.7 | B | 15.1 | B |
| between Interchange 5W (Kirkville Rd) on-ramp and Exit 5E (Kirkville Rd) | Weave | 17.3 | B | 15.2 | B | 20.0 | B | 17.5 | B |
| between Interchange 3W (West NY 5 ) on-ramp and Exit 3E (East NY 5 ) | Weave | 13.8 | B | 28.9 | D | 15.1 | B | 37.2 | E |
| **Eastbound I-690** | | | | | | | | | |
| between Exit 8 (Hiawatha Blvd) and Exit 9 (Bear St) | BFS | 27.0 | D | 14.2 | B | 34.2 | D | 16.1 | B |
| between Exit 9 (Bear St) and Interchange 10 (N. Geddes St) on-ramp | BFS | 25.0 | C | 13.3 | B | 32.4 | D | 15.1 | B |
| between Northbound formerI-81 off-ramp and West St on-ramp | BFS | 27.6 | D | 17.9 | B | 27.9 | D | 18.5 | C |
| between Crouse interchange off and on -ramp | BFS | 20.7 | C | 19.5 | C | 20.2 | C | 19.4 | C |
| between Interchange 14 (Teall Av) off and on-ramps | BFS | 19.1 | C | 31.9 | D | 17.5 | B | 22.0 | C |
| at Exit 8 (Hiawatha Blvd) | Diverge | 22.4 | C | 14.5 | B | 26.6 | C | 15.9 | B |
| at Exit 9 (Bear St) | Diverge | 22.9 | C | 12.5 | B | 28.5 | D | 13.9 | B |
| at Exit ramp to NB former I-81 | Diverge | 28.8 | D | 21.7 | C | 31.6 | D | 22.9 | C |
| at Exit 11 (West St) off-ramp | Diverge | 18.3 | B | 12.7 | B | 28.2 | D | 14.1 | B |

**Table 5-62**
**2020 and 2050 Community Grid Alternative Freeway LOS Analysis**

| Segment | Type | 2020 AM Density (pc/mi/ln) | 2020 AM LOS | 2020 PM Density (pc/mi/ln) | 2020 PM LOS | 2050 AM Density (pc/mi/ln) | 2050 AM LOS | 2050 PM Density (pc/mi/ln) | 2050 PM LOS |
|---|---|---|---|---|---|---|---|---|---|
| at Interchange 8 (State Fair Blvd) on-ramp | Merge | 20.2 | C | 14.0 | B | 23.3 | C | 15.3 | B |
| at Interchange 10 (N. Geddes St) on-ramp | Merge | 26.3 | C | 21.2 | C | 41.4 | F | 22.0 | C |
| at Interchange 11 (West St) on-ramp | Merge | 21.9 | C | 19.2 | B | 20.2 | C | 15.7 | B |
| at Interchange 14 (Teall Av) on-ramp | Merge | 18.6 | B | 32.6 | D | 18.0 | B | 22.7 | C |
| between Southbound former I-81 on-ramp and Irving Ave off-ramp | Weave | 25.2 | C | 19.9 | B | 26.3 | C | 18.6 | B |
| between Crouse Ave on-ramp and Exit 14 (Teall Av) | Weave | 20.9 | C | 27.5 | C | 18.3 | B | 22.2 | C |
| **Westbound I-690** | | | | | | | | | |
| between Teall Ave off and on-ramps | BFS | 27.8 | D | 23.0 | C | 20.8 | C | 24.2 | C |
| between Crouse Av off-ramp and Irving Av on-ramp | BFS | 17.6 | B | 28.3 | D | 18.7 | C | 26.1 | D |
| between West St off-ramp and Southbound former I-81 on-ramp | BFS | 9.1 | A | 15.2 | B | 9.8 | A | 23.2 | C |
| between Exit 10 (N. Geddes St) and Interchange 9 (Bear St) on-ramp | BFS | 10.6 | A | 22.7 | C | 12.0 | B | 22.5 | C |
| between Interchange 9 (Bear St) and Interchange 8 (State Fair Blvd) on-ramps | BFS | 12.8 | B | 28.4 | D | 14.2 | B | 29.3 | D |
| at Exit 14 (Teall Av) | Diverge | 23.8 | C | 21.4 | C | 19.9 | B | 22.4 | C |
| at Exit 11 (West St) off-ramp | Diverge | 8.9 | A | 14.8 | B | 9.8 | A | 21.7 | C |
| at Southbound former I-81 on-ramp | Merge | 13.1 | B | 20.1 | C | 14.3 | B | 31.9 | D |
| at Interchange 9 (Bear St) on-ramp | Merge | 13.1 | B | 31.6 | D | 14.5 | B | 39.7 | E |
| at Interchange 8 (Hiawatha Blvd) on-ramp | Merge | 12.9 | B | 24.3 | C | 14.0 | B | 25.0 | C |
| between Interchange 14 (Teall Av) on-ramp and Crouse Ave off-ramp | Weave | 28.8 | D | 22.8 | C | 18.3 | B | 22.6 | C |
| between Irving Ave on-ramp and Northbound former I-81 off-ramp | Weave | 13.1 | B | 20.6 | C | 16.3 | B | 23.9 | C |
| between Interchange 11 (West St) on-ramp and Exit 10 (N. Geddes St) | Weave | 11.0 | B | 19.3 | B | 12.0 | B | 41.3 | E |

**Table 5-63**
**2020 and 2050 Community Grid Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West St. at NY 5/W. Genesee St. | 26.5 | C | 27.4 | C | 26.9 | C | 28.5 | C |
| D-10 | Wallace St. at NY 5/W. Genesee St. | 18.4 | B | 5.9 | A | 16.4 | B | 8.1 | A |
| D-11 | N. Franklin St. /Butternut St. at N. Franklin St. | 23.2 | C | 22.1 | C | 17.1 | B | 31.0 | C |
| D-12 | N. Franklin St. at Herald Pl | 7.6 | A | 13.7 | B | 7.1 | A | 16.7 | B |
| D-13 | N. Franklin St. at NY 5/W. Genesee St. | 19.4 | B | 18.5 | B | 22.5 | C | 16.6 | B |
| D-19 | N. Clinton St. at Webster Landing | 2.3 | A | 0.4 | A | 0.8 | A | 0.3 | A |
| D-21 | N. Clinton St. at NY 5/W. Genesee St. | 26.8 | C | 37.9 | D | 26.0 | C | 24.4 | C |
| D-24 | S. Clinton St. at W. Washington St. | 10.3 | B | 22.2 | C | 8.3 | A | 19.1 | B |
| D-25 | S. Clinton St. at W. Fayette St. | 14.8 | B | 5.9 | A | 11.2 | B | 7.6 | A |
| D-27 | S. Clinton St. at W. Onondaga St. | 19.4 | B | 19.6 | B | 9.1 | A | 13.1 | B |
| D-28 | S. Clinton St. at W. Adams St. | 14.3 | B | 19.6 | B | 13.9 | B | 29.6 | C |
| D-32 | N. Salina St. at Herald Pl | 34.3 | C | 20.9 | C | 6.1 | A | 7.0 | A |
| D-33 | N. Salina St. at E./W. Willow St. | 40.8 | D | 7.7 | A | 30.8 | C | 9.4 | A |
| D-34 | N. Salina St. at NY 5/W. Genesee St./James St. | 18.5 | B | 18.2 | B | 19.0 | B | 18.6 | B |
| D-36 | S. Salina St. at E./W. Washington St. | 18.8 | B | 12.8 | B | 14.8 | B | 20.0 | B |
| D-37 | S. Salina St. at E./W. Fayette St. | 13.5 | B | 9.5 | A | 17.2 | B | 11.7 | B |
| D-39 | S. Salina St. at Harrison St. and Onondaga St. | 31.6 | C | 27.3 | C | 45.8 | D | 33.8 | C |
| D-40 | S. Salina St. at E./W. Adams St. | 76.4 | E | 33.9 | C | 23.6 | C | 70.8 | E |
| D-46 | Pearl St. at Hickory St. | 1.1 | A | 0.9 | A | 1.7 | A | 1.1 | A |
| D-47 | Pearl St. at E. Willow St. | 15.4 | C | 13.9 | B | 9.9 | A | 17.0 | C |
| D-48 | N. Warren St. at E. Willow St. | 4.4 | A | 11.1 | B | 2.5 | A | 15.0 | B |
| D-49 | N. Warren St. at NY 5/James St. | 12.1 | B | 9.3 | A | 17.7 | B | 12.2 | B |
| D-50 | N. Warren St. at E. Erie Blvd. | 0.2 | A | 0.1 | A | 0.1 | A | 0.1 | A |
| D-56 | S. Warren St. at Harrison St. | 20.1 | C | 21.7 | C | 17.2 | B | 19.7 | B |
| D-57 | S. Warren St. at E. Adams St. | 8.1 | A | 15.0 | B | 10.6 | B | 13.3 | B |
| D-58 | Oswego Blvd. at James St. | 12.0 | B | 15.9 | B | 16.5 | B | 14.9 | B |
| D-59 | NY 5/Oswego Blvd./ at Montgomery St. | 29.1 | C | 25.5 | C | 34.8 | C | 26.8 | C |
| D-66 | Montgomery St. at Harrison St. | 10.2 | B | 8.9 | A | 11.6 | B | 10.0 | A |
| D-67 | Montgomery St. at E. Adams St. | 5.6 | A | 14.2 | B | 7.1 | A | 11.5 | B |
| D-68 | US 11/N. State St. at Hickory St. | 1.8 | A | 1.3 | A | 1.0 | A | 1.4 | A |
| D-69 | US 11/N. State St. at E. Willow St. | 12.1 | B | 17.2 | B | 16.0 | B | 31.0 | C |
| D-71 | US 11/S. State St. at NY 5/Erie Blvd. E. | 28.8 | C | 29.8 | C | 54.8 | D | 51.3 | D |
| D-73 | US 11/S. State St. at E. Washington St. | 25.3 | C | 19.8 | B | 34.5 | C | 93.3 | F |
| D-78 | US 11/S. State St. at Harrison St. | 18.9 | B | 18.1 | B | 19.0 | B | 30.2 | C |
| D-79 | US 11/S. State St. at E. Adams St. | 13.1 | B | 16.2 | B | 14.3 | B | 17.9 | B |
| D-83 | N. Townsend St. at Westbound I-690 Off-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

**Table 5-63**
**2020 and 2050 Community Grid Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-84 | N./S. Townsend St. at NY 5/Erie Blvd. E. | 19.7 | B | 11.9 | B | 49.3 | D | 15.2 | B |
| D-86 | S. Townsend St. at E. Washington St. | 10.9 | B | 40.7 | D | 13.9 | B | 12.6 | B |
| D-87 | S. Townsend St. at E. Fayette St. | 19.9 | B | 38.2 | D | 11.3 | B | 13.0 | B |
| D-88 | S. Townsend St. at NY 92/E. Genesee St. | 19.2 | B | 63.1 | E | 10.1 | B | 16.4 | B |
| D-89 | S. Townsend St. at Harrison St. | 18.8 | B | 16.7 | B | 24.2 | C | 16.1 | B |
| D-90 | S. Townsend St. at E. Adams St. | 16.0 | B | 15.8 | B | 16.6 | B | 15.3 | B |
| D-92 | N. McBride St. at EB I-690 On-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-93 | N./S. McBride St. at NY 5/Erie Blvd. E. | 17.5 | B | 9.4 | A | 28.6 | C | 16.1 | B |
| D-99 | Catherine St. at Burnet Ave. | 21.6 | C | 17.3 | B | 15.0 | B | 13.7 | B |
| D-100 | Almond St./Catherine St. at NY 5/Erie Blvd. E. | 17.0 | B | 19.0 | B | 27.4 | C | 21.0 | C |
| D-101 | Almond St. at E. Water St. | 9.7 | A | 15.2 | B | 12.0 | B | 16.0 | B |
| D-102 | Almond St. at E. Washington St. | 18.7 | B | 9.0 | A | 10.7 | B | 9.8 | A |
| D-103 | Almond St. at E. Fayette St. | 14.8 | B | 14.3 | B | 15.4 | B | 15.2 | B |
| D-104 | Almond St. at NY 92/E. Genesee St. | 13.4 | B | 13.9 | B | 14.0 | B | 14.1 | B |
| D-105 | Almond St. at Southbound I-81 Off-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-106 | Harrison St. at Southbound I-81 Off-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-107 | Almond St. at Harrison St. | 30.7 | C | 35.8 | D | 33.5 | C | 35.0 | C |
| D-108 | Almond St. at E. Adams St. | 23.3 | C | 27.0 | C | 23.9 | C | 25.0 | C |
| D-109 | Almond St. at Burt St. | 6.7 | A | 7.1 | A | 6.8 | A | 7.8 | A |
| D-110 | Almond St. at Van Buren St. | 12.3 | B | 29.1 | D | 11.7 | B | 19.8 | C |
| D-116 | Midland Ave. at W. MLK Jr. E. | 5.6 | A | 53.4 | F | 1.7 | A | 4.5 | A |
| D-118 | West St. at Westbound I-690 Ramps | 36.1 | D | 18.7 | B | 25.1 | C | 19.8 | B |
| D-119 | West St. at Eastbound I-690 Ramps | 27.6 | C | 11.7 | B | 55.7 | E | 17.1 | B |
| D-120 | Southbound I-81 Off-ramp and Willow St. | 21.4 | C | 13.6 | B | 12.2 | B | 21.3 | C |
| D-121 | Pearl St. at James St. | 18.8 | B | 20.2 | C | 22.8 | C | 7.2 | A |
| D-122 | Almond St. and MLK Jr. E. | 8.3 | A | 11.3 | B | 8.5 | A | 13.0 | B |
| D-123 | Catherine St. at Westbound I-690 Off-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-124 | Catherine St. at Eastbound I-690 On-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-125 | MLK Jr. E. at Southbound I-81 On-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-126 | MLK Jr. E. at Northbound I-81 Off-Ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-127 | State Route at New Connecting Rd. | 9.6 | A | 14.6 | B | 6.2 | A | 11.4 | B |
| D-128 | E Brighton at New Connecting Rd. | 12.0 | B | 3.1 | A | 5.0 | A | 2.3 | A |

**Table 5-63**
**2020 and 2050 Community Grid Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-139 | Salina St. at SB I-81 Exit 19 Off-ramp | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| U-1 | N. Crouse Ave. at Burnet Ave. | 17.8 | B | 49.9 | D | 18.0 | B | 56.0 | E |
| U-4 | Westmoreland Ave. at Burnet Ave. | 17.0 | C | 24.8 | C | 21.1 | C | 65.4 | F |
| U-7 | Teall Ave. at Canal St. | 1.0 | A | 6.1 | A | 0.9 | A | 4.7 | A |
| U-10 | N./S. Crouse Ave. at Erie Blvd. E. | 14.9 | B | 16.4 | B | 13.3 | B | 17.2 | B |
| U-16 | Teall Ave. at Erie Blvd. E. | 44.2 | D | 50.8 | D | 42.7 | D | 47.2 | D |
| U-19 | S. Crouse Ave. at E. Water St. | 6.9 | A | 18.2 | B | 7.3 | A | 28.2 | C |
| U-24 | Irving Ave. at E. Fayette St. | 9.9 | A | 15.1 | B | 13.2 | B | 19.0 | B |
| U-25 | S. Crouse Ave. at E. Fayette St. | 8.2 | A | 10.4 | B | 10.0 | A | 9.7 | A |
| U-31 | Irving Ave. at NY 92/E. Genesee St. | 20.0 | C | 26.0 | C | 16.7 | B | 31.3 | C |
| U-32 | S. Crouse Ave. at NY 92/E. Genesee St. | 12.6 | B | 18.5 | B | 15.1 | B | 22.4 | C |
| U-41 | Sarah Loguen Dr. at Harrison St. | 10.3 | B | 17.0 | B | 13.6 | B | 21.0 | C |
| U-42 | Elizabeth Blackwell Dr. at Harrison St. | 1.1 | A | 2.5 | A | 2.0 | A | 5.8 | A |
| U-43 | Irving Ave. at Harrison St. | 15.6 | B | 19.8 | B | 19.9 | B | 21.3 | C |
| U-44 | S. Crouse Ave. at Harrison St. | 18.9 | B | 23.9 | C | 16.9 | B | 20.6 | C |
| U-51 | Irving Ave. at E. Adams St. | 20.9 | C | 17.1 | B | 32.2 | C | 17.5 | B |
| U-52 | S. Crouse Ave. at E. Adams St. | 15.1 | B | 16.5 | B | 13.4 | B | 16.4 | B |
| U-56 | Irving Ave. at Waverly Ave. | 19.6 | B | 21.3 | C | 19.5 | B | 35.8 | D |
| U-57 | S. Crouse Ave. at Waverly Ave. | 28.0 | C | 10.8 | B | 22.8 | C | 14.3 | B |
| U-58 | University Ave. at Waverly Ave. | 42.7 | D | 30.4 | C | 29.9 | C | 42.5 | D |
| U-62 | Irving Ave. at University Pl | 20.3 | C | 24.1 | C | 16.7 | B | 23.0 | C |
| U-63 | Irving Ave. at Van Buren St. | 15.9 | B | 27.8 | C | 20.4 | C | 31.5 | C |
| U-65 | Comstock Ave. at Euclid Ave. | 73.6 | E | 21.4 | C | 23.0 | C | 63.9 | E |
| U-67 | Comstock Ave. at Stratford St. | 59.5 | F | 32.9 | D | 53.8 | F | 58.7 | F |
| U-68 | Crouse Ave. at Westbound I-690 | 25.6 | C | 14.0 | B | 21.5 | C | 16.9 | B |
| U-69 | Crouse Ave. at Eastbound I-690 | 12.7 | B | 5.4 | A | 13.5 | B | 5.4 | A |
| U-70 | Irving Ave. at Erie Blvd. | 22.7 | C | 18.8 | B | 21.8 | C | 21.9 | C |
| U-71 | Irving Ave. at Water St. | 6.4 | A | 17.0 | B | 6.7 | A | 16.2 | B |
| W-1 | Southbound I-81 On-Ramp/Genant Dr. at Bear St. | 11.8 | B | 25.3 | C | 14.6 | B | 16.7 | B |
| W-3 | Southbound I-81 Off-Ramp/Genant Dr. at Spencer St. | 14.6 | B | 7.5 | A | 30.6 | D | 7.9 | A |
| W-4 | Solar St. at Hiawatha Blvd. W. | 36.6 | D | 27.7 | C | 21.6 | C | 41.4 | D |
| W-5 | Spencer St. at Hiawatha Blvd. W. | 22.1 | C | 28.5 | C | 24.4 | C | 59.5 | E |
| W-6 | I-690 East Off-Ramp at Hiawatha Blvd. W. | 13.8 | B | 18.5 | B | 14.4 | B | 26.7 | C |
| W-9 | Spencer St. at Bear St./I-690 Ramps | 13.3 | B | 15.2 | B | 14.2 | B | 16.8 | B |
| W-12 | N. Geddes St. at Westbound I-690 Off-Ramp | 17.0 | B | 14.7 | B | 19.0 | B | 15.0 | B |
| W-13 | N. Geddes St. at Edison St. | 9.7 | A | 2.3 | A | 12.1 | B | 2.5 | A |

**Table 5-63**
**2020 and 2050 Community Grid Alternative Intersection LOS Analysis**

| ID | Intersection Name | 2020 | | | | 2050 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM | | PM | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| W-15 | N. Geddes St. at NY 5/W. Genesee St. | 23.9 | C | 71.6 | E | 27.1 | C | 40.5 | D |
| W-17 | N. Geddes St. at Wilkinson St. | 3.8 | A | 31.0 | D | 4.1 | A | 43.1 | E |
| W-19 | N./S. Geddes St. at Erie Blvd. W. | 50.0 | D | 70.8 | E | 47.9 | D | 101.7 | F |
| W-20 | S. Geddes St. at W. Fayette St. | 47.6 | D | 104.1 | F | 70.5 | E | 113.4 | F |
| W-21 | S. Geddes St. at Marcellus St. | 40.7 | E | 76.9 | F | 33.4 | D | 81.7 | F |
| W-22 | S. Geddes St. at Otisco St. | 37.2 | D | 56.3 | E | 36.4 | D | 62.0 | E |
| W-23 | S. Geddes St. at Gifford St. | 45.6 | D | 60.9 | E | 44.1 | D | 57.5 | E |
| W-24 | S. Geddes St. at Seymour St. | 33.5 | C | 50.7 | D | 33.4 | C | 53.7 | D |
| W-25 | S. Geddes St. at Grand Ave./Shonnard St. | 79.0 | E | 37.9 | D | 83.1 | F | 14.2 | B |
| **Note: Intersection ID denotes the general location. D = Downtown, U = University Hill, and W = Westside and Lakefront** | | | | | | | | | |

The following locations would operate at unacceptable levels (LOS E or F):

- Intersection D-40 – Salina Street and Adams Street (2020 AM and 2050 PM peak hours)
- Intersection D-73 – State Street and Washington Street (2050 PM peak hour)
- Intersection D-88 – Townsend Street and NY 92/Genesee Street (2020 PM peak hour)
- Intersection D-116 – Midland Avenue and MLK. Jr., East (2020 PM peak hour)
- Intersection D-119 – West Street and the eastbound I-690 Ramps (2050 AM peak hour)
- Intersection U-1 – Crouse Avenue and Burnet Avenue (2050 PM peak hour)
- Intersection U-4 – Westmoreland Avenue and Burnet Avenue (2050 PM peak hour)
- Intersection U-65 – Comstock Avenue Euclid Avenue (2020 AM and 2050 PM peak hours)
- Intersection U-67 – Comstock Avenue and Stratford Street (2020/2050 AM peak hours and 2050 PM peak hour)
- Intersection W-5 – Spencer Street and Hiawatha Boulevard (2050 PM peak hour)
- Intersection W-15 – Geddes Street and NY 5/Genesee Street (2020 PM peak hour).
- Intersection W-17 – Geddes Street and Wilkinson Street (2050 PM peak hours).
- Intersection W-19 – Geddes Street and Erie Boulevard (2020/2050 PM peak hours).
- Intersection W-20 – Geddes Street and Fayette Street (2050 AM peak hour and 2020/2050 PM peak hours).
- Intersection W-21 – Geddes Street and Marcellus Street (2020 AM peak hour and 2020/2050 PM peak hours).
- Intersection W-22 – Geddes Street and Otisco Street (2020/2050 PM peak hours).

- Intersection W-23 – Geddes Street and Gifford Street (2020/2050 PM peak hours).
- Intersection W-25 – Geddes Street and Grand Avenue/Shonnard Street (2020/2050 AM peak hours).

Note that LOS would be improved substantially from 2020 to 2050 for a number of intersections (e.g., D-84, D-88, D-116, etc.) in **Table 5-63**, because of the expected implementation of signal optimization as part of the Downtown Syracuse two-way feasibility project. The pair of high-speed interconnect ramps from eastbound I-690 to northbound former I-81 and from southbound former I-81 to westbound I-690 provided under the Community Grid Alternative would attract a greater number of motorists to use I-690 interchange 10 at Geddes Street. The associated higher peak hour traffic volumes would cause seven intersections on Geddes Street to become saturated in 2020 and 2050. Mitigation measures may be introduced in the future to improve LOS at intersections operating at saturated levels.

*Work Zone Safety & Mobility*

The maintenance and protection of traffic (MPT) and staging concepts developed for the Project and described in Chapter 4 balance the provision of work zone safety with the need to provide mobility for all road users, while maintaining a realistic construction schedule. The staging concepts presented provide the Contractor with sizeable areas for off-line demolition and construction, which in addition to improving the efficiency of the work and reducing both cost and schedule, also provides a considerable separation between motorists and the work zone. This would increase safety for both construction workers and the traveling public. The staging also avoids numerous traffic pattern changes throughout the duration of the Project, particularly for interstate motorists, thereby reducing the impacts associated with traffic pattern adjustments.

NYSDOT has determined that the Project is significant per 23 CFR 630.1010 and therefore as the project design is developed and refined, a Traffic Management Plan (TMP) will be developed in compliance with 23 CFR 630. 1012. The Traffic Management Plan will address both Traffic Operations (TO) and Public information (PI) strategies for the Project. TO strategies will include identifying and ratifying agreements for all TO elements impacted or related to the Project in both the temporary and permanent condition. TO elements will include maintenance responsibilities, temporary access requirements and agreements, safety patrol and/or vehicle recovery requirements and cost sharing agreements for utility usage. The aim of the TO strategies is to provide a detailed understanding of the role and responsibilities of all parties throughout the duration of the Project. The PI strategies will detail how the project development and construction impacts are communicated to road users and other stakeholders. The PI will identify stakeholders and detail the communication requirements and methods for each. PI elements will likely include Public Outreach through community events, internet, mailings, radio, and local television.

Building on the MPT and staging strategies presented in Chapter 4, the TMP will include a Temporary Traffic Control (TCC) plan in compliance with Chapter 6 of the Manual of Uniform traffic Control Devices (MUTCD), which will facilitate the reasonably safe and efficient road user flow and highway worker safety.

### Safety Considerations, Accident History and Analysis

Safety performance measures are required to identify safety problems that may exist in the project area and to evaluate the effectiveness of the build alternatives in addressing these problems. Traditionally, evaluating the safety of a proposed improvement alternative begins with a review of the facility's accident history and applying accident reduction factors from NYSDOT's Post Implementation Evaluation System (PIES). PIES includes factors for capital improvements typically constructed as part of a major highway project and low cost improvements (highway signs, pavement markings, signal timing, etc.) that are usually implemented through minor maintenance activities. However, the proposed build alternatives for the I-81 Viaduct Project would alter roadway geometrics substantially, such that proposed roadway segments would not align with existing roadway segments and associated empirical data.

To address this issue, the FHWA Surrogate Safety Assessment Model (SSAM) was used to develop surrogate safety measures of effectiveness (MOEs), based on vehicle trajectory information from the VISSIM microscopic traffic simulation model. One of the surrogate safety measures is the traffic "conflict", defined as an occurrence when two or more road users would collide if intervening action is not taken. The FHWA document "Surrogate Safety Assessment Model (SSAM) and Validation (FHWA-HRT-08-051, June 2008" asserts that the traffic conflict is a reliable surrogate safety measure of comparative safety, due to its correlation with actual crashes. Therefore, higher rates of traffic conflicts can indicate lower levels of safety.

Vehicle trajectories produced by the VISSIM simulation model were input to SSAM to generate traffic conflicts and associated surrogate safety measures. Safety MOEs for the Community Grid Alternative are compared to the No Build condition for 2050 peak hours **Table 5-64**. The frequency of rear-end conflicts under the Community Grid Alternative would decrease by 37 percent. Speeding and following too closely are common driver behaviors on freeways and are known to precipitate rear-end conflicts. Decreased travel on the interstate system under the Community Grid Alternative would contribute to a system-wide decrease in rear-end conflicts. In addition, lane-changing conflicts would decrease by 24 percent due to a reduction in the number of interchange on- and off-ramps, the addition of auxiliary lanes, and the lengthening of acceleration/deceleration lanes. Crossing conflicts would decrease by 13 percent. The total for all conflict types would decrease by 21 percent, indicating that a substantial safety benefit in the form of a reduction in the number of accidents could be expected.

**Table 5-64**
**Safety Measures of Effectiveness – No Build and Community Grid (2050)**

| Scenario | No Build | | | Community Grid | | |
|---|---|---|---|---|---|---|
| MOE/Peak | AM | PM | AM+PM | AM | PM | AM+PM |
| Rear End Conflicts | 52,796 | 53,415 | 106,211 | 29,589 | 37,353 | 66,942 |
| Lane Change Conflicts | 72,476 | 73,619 | 146,096 | 43,111 | 68,317 | 111,429 |
| Crossing Conflicts | 121,154 | 156,736 | 277,890 | 94,260 | 147,521 | 241,781 |
| Total Conflicts | 246,426 | 283,770 | 530,196 | 166,960 | 253,191 | 420,152 |

## Construction Traffic Analysis

*Introduction*

In an effort to minimize the total duration of construction and the resulting disturbances associated with its construction, aggressive construction schedules have been established for the I-81 Viaduct Project. For the Community Grid Alternative, five years has been determined to be the minimum construction duration. To achieve this schedule and allow for traffic to be maintained in and through the Project Area, the Project would be constructed in several major phases as follows:

- Phase 1 – Preparatory Phase, focusing on conversion of I-481 to serve as the new I-81, closing down and demolition of the existing I-81 viaduct, and initiation/construction of specific Community Grid Improvements within the I-81 Priority Area
- Phase 2A – I-690 Eastbound Shutdown and Construction
- Phase 2B – I-690 Westbound Shutdown and Construction

For the Community Grid Alternative, the preparatory Phase 1 would include reconstruction of the existing I-81/I-481 northern and southern interchanges, additional capacity improvements along the existing I-481 alignment, construction of the new I-690 interchange at Crouse and Irving Avenues, removal of the existing I-81 viaduct, and many of the local street improvements associated with the alternative. These elements would become permanent features of the transportation system, but also would facilitate traffic flow during Phase 2.

Complete descriptions of all construction phases, and means and methods are presented in Chapter 4.

Traffic analyses were conducted to assess operating conditions and to identify temporary roadway improvements that would be necessary during construction of the Community Grid Alternative. The intent of the traffic analysis is to verify that adequate traffic operations could be maintained during construction. Construction Phase 2A would involve closure of the eastbound I-690 roadway between West Street and Beech Street, and eastbound I-690 traffic would be diverted to alternate routes. Construction Phase 2B, entails an 18-month closure of the westbound I-690 roadway from Leavenworth Avenue (west of the West Street Interchange) and Beech Street, a distance of approximately two miles. During Phase 2B, westbound I-690 traffic would be shifted to the newly constructed I-690 eastbound roadway and eastbound I-690 traffic would continue to use alternate routes. This would help maintain continuity of diversion patterns throughout construction Phases 2A and 2B. However, since contra-flow operations would occur on I-690 during Phase 2B, the utilization of existing exit/entrance ramp would be more limited than in Phase 2A. Therefore, Phase 2B was studied as the worst-case scenario. A detailed Traffic Management Plan including all construction phases will be developed when design advances for the selected alternative.

*Traffic Volumes*

The SMTC Regional Travel Demand Model was used to identify the change in travel patterns that would occur during construction Phase 2B. Traffic volumes were compared to those for the No Build Alternative and volume-to-capacity (v/c) ratios were derived from

the model to identify freeway segments and intersections that would experience the greatest potential impact during construction if no temporary improvements were implemented. Impacted freeway segments and potentially impacted intersections were then analyzed.

The removal of I-81 through the city and closure of I-690 (and associated connectors/ramps) to eastbound traffic would result in substantial travel pattern changes due to the diversion of through trips (i.e. trips currently passing through Syracuse without an origin or destination in Syracuse) to I-481 and the local streets, as well as the diversion of local trips that are redirected to alternative access points due to multiple ramp closures. It should be noted that approximately 12 percent of the total traffic volume currently using I-81 through Downtown Syracuse is attributed to through-traffic having both origins and destinations beyond the limits of the two I-81 interchanges with I-481. During Phase 2B, much of this through traffic would use the re-designated I-81 (on the existing I-481 alignment) and this would become the permanent condition.

During this phase, traffic currently using eastbound I-690 would be diverted to local roads that would have been improved during Phase 1. Major local street routes anticipated to experience traffic diversions include West Street, Genesee Street, and Erie Boulevard to North Crouse Avenue or Teall Avenue.

Additional traffic caused by construction activities also was considered. Preliminary construction plans indicate shift times would begin at 7:00 AM and end at 4:00 PM and therefore, the majority of construction worker related traffic would occur outside of the peak traffic hours. However, it is expected that some workers involved in management and clerical activities would travel during the peak hours, and traffic volumes were increased by one percent in the AM and PM peak hours to account for this additional construction-related traffic. In addition, heavy vehicle percentages were adjusted at key intersections to account for additional truck traffic. **Table 5-65** compares 2020 peak hour traffic volumes for the No Build condition with construction conditions on key roadway segments and indicates substantial traffic volume increases in the following locations:

- I-481
- Clinton Street
- Salina Street
- Pearl Street
- Irving Avenue
- Crouse Avenue
- Erie Boulevard
- Franklin Street
- Genesee Street

**Table 5-65**

**2020 No Build and Community Grid Phase 2B Peak Hour Traffic Volumes**

| Location | Direction | AM | | PM | |
|---|---|---|---|---|---|
| | | No Build | CG Construction Phase2 B | No Build | CG Construction Phase 2B |
| I-81 Just North of Colvin Street Interchange | NB | 2,928 | 1,193 | 2,913 | 1,118 |
| | SB | 2,322 | 753 | 3,457 | 1,746 |
| I-81 Just South of Court/Spencer Street interchange | NB | 2,439 | 1,612 | 5,843 | 5,225 |
| | SB | 5,161 | 3,615 | 3,466 | 1,569 |
| I-481 Just South of I-690 Interchange | NB | 3,424 | 4,294 | 2,739 | 3,702 |
| | SB | 1,995 | 2,753 | 3,501 | 4,494 |
| I-481 Just North of I-690 Interchange | NB | 2,262 | 2,580 | 2,971 | 3,341 |
| | SB | 2,692 | 3,665 | 2,415 | 3,550 |
| I-690 Just West of West Street Interchange | EB | 4,432 | 2,560 | 2,499 | 918 |
| | WB | 1,938 | 2,385 | 3,952 | 4,767 |
| I-690 Just East of Teall Avenue Interchange | EB | 3,545 | 861 | 4,708 | 1,565 |
| | WB | 3,902 | 2,560 | 3,867 | 2,432 |
| Clinton Street Just North of Genesee Street | SB | 534 | 1,346 | 287 | 1,012 |
| Salina Street Just North of Genesee/James Streets | NB | 203 | 429 | 361 | 898 |
| | SB | 734 | 1,232 | 364 | 583 |
| Almond Street Just South of Harrison Street | NB | 956 | 755 | 1,804 | 847 |
| | SB | 1,538 | 488 | 1,174 | 811 |
| Irving Avenue Just North of Genesee Street | NB | 107 | 255 | 179 | 517 |
| | SB | 204 | 472 | 116 | 210 |
| Crouse Avenue Just North of Genesee Street | NB | 114 | 372 | 243 | 803 |
| | SB | 46 | 232 | 75 | 157 |
| Erie Boulevard Just East of Almond Street | EB | 356 | 875 | 351 | 1,084 |
| | WB | 269 | 580 | 388 | 535 |
| Harrison Street Just East of Almond Street | EB | 48 | 785 | 53 | 401 |
| | WB | 825 | 584 | 1,622 | 1,256 |
| Adams Street Just East of Almond Street | EB | 1,705 | 618 | 803 | 651 |
| Pearl Street Just North of Willow Street | NB | 106 | 247 | 759 | 1,509 |
| Genesee Street Just East of West Street | EB | 1,095 | 1,822 | 546 | 1,221 |
| | WB | 327 | 585 | 721 | 1,095 |
| Franklin Street Just North of Genesee Street | NB | 296 | 739 | 619 | 1,168 |
| | SB | 351 | 597 | 238 | 524 |

*Level of Service and Mobility*

*Freeway Level of Service*

AM and PM peak hour LOS analyses were conducted for segments along I-81, I-481, and I-690 within the project area with projected v/c ratios of 0.7 or higher, based on the SMTC regional model because locations with v/c ratios below 0.7 would be expected to operate at LOS C or better and be uncongested during construction Phase 2B. It is expected that the traffic on the tie-in ramps where the mainline interstate closures begin and end would increase substantially. The West Street off-ramp would experience high traffic volumes since it would be the last exit before I-690 is closed to eastbound traffic. During the AM peak hour, traffic volume is estimated to be approximately 1,700 vehicles, which can be accommodated by the two-lane off-ramp constructed during Phase 2A. The Crouse Avenue on-ramp would carry approximately 2,000 vehicles during Phase 2B, exceeding the capacity of the one lane proposed for the permanent condition, resulting in LOS F.

During Phase 2B, the Clinton/Salina Street off-ramp would become the last exit from existing southbound I-81 before the I-81 closure. The Clinton/Salina off-ramp would need to accommodate approximately 2,300 vehicles during AM peak hour, exceeding the capacity of the one-lane ramp proposed for the permanent condition, resulting in LOS F. The Pearl Street on-ramp would be the southernmost access point to existing northbound I-81 and would attract a large volume of traffic during Phase 2B. The Pearl Street on-ramp would need to accommodate approximately 2,700 vehicles during the PM peak hour, exceeding the capacity of the existing one-lane ramp and resulting in LOS F.

To improve traffic operations, the Crouse Avenue on-ramp, Clinton Street off-ramp, and Pearl Street on- ramp would be temporarily widened from one lane to two lanes each to accommodate the additional traffic. With the proposed improvements, each of these locations would operate acceptably (LOS D or better). The traffic volume and number of lanes with and without improvements are shown in **Table 5-66**. The freeway segments density and LOS are summarized as **Table 5-67**.

**Table 5-66**
**2020 Community Grid Alternative Construction Traffic Volume and MPT Plan**

| Segment | Type | Traffic Volume (vph) | | Number of Lanes | |
|---|---|---|---|---|---|
| | | | | Community Grid Alternative | |
| | | AM | PM | without Improvement | with Improvement |
| Northbound I-81 at Pearl Street on-ramp | Merge | 1,076 | 2,695 | 1 | 2 |
| Southbound I-81 at Clinton/Salina Street off-ramp | Diverge | 2,290 | 1,371 | 1 | 2 |
| Eastbound I-690 at Crouse Avenue on-ramp | Merge | 1,306 | 2,062 | 1 | 2 |

**Table 5-67**
**2020 Community Grid Construction Freeway LOS Analysis**

| Segment | Type | AM | | | | PM | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Community Grid Alternative | | | | | | | |
| | | without Improvement | | with Improvement | | without Improvement | | with Improvement | |
| | | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS |
| Northbound I-81 at Pearl Street on-ramp | Merge | 22.3 | C | 11.1 | B | 201.4 | F | 27.9 | D |
| Southbound I-81 at Clinton/Salina Street off-ramp | Diverge | 85.3 | F | 25.1 | C | 29.4 | D | 14.7 | B |
| Eastbound I-690 at Crouse Avenue on-ramp | Merge | 28.6 | D | 14.3 | B | 57.2 | F | 22.6 | C |

*Intersection Level of Service*

AM and PM peak hour capacity analyses were conducted for 29 intersections expected to experience substantial traffic volume increases during construction Phase 2B. Traffic would increase substantially at intersections adjacent to tie-in ramps where the mainline interstate closures begin and end. Clinton Street and Salina Street would experience heavy traffic as they connect directly to the last exit before the southbound I-81 mainline closure. Removal of the Harrison Street on-ramp to northbound I-81 would require traffic from downtown destined to northbound I-81 to use to Pearl Street and other routes, largely via State Street. MLK Jr., East and Renwick Avenue would experience heavy traffic as southbound traffic would use these routes to access the elevated state route and ultimately southbound I-81. Conversely, traffic originating south of the city, would travel these routes as the elevated highway transitions to the surface street network near MLK, Jr., East. Peak hour intersection LOS under Phase 2B construction conditions without additional improvements are shown in **Table 5-68**. Intersections expected to operate at LOS E or F are as follows:

- Wallace Street at NY 5/W. Genesee Street (AM and PM peak hours)
- N. Franklin Street at NY 5/W. Genesee Street (PM peak hour)
- N. Salina Street at SB I-81 Off-ramp (AM peak hour)
- N. Salina Street at NY 5/W. Genesee Street/James Street (AM peak hour)
- Pearl Street at Hickory Street (AM and PM peak hours)
- US 11/N. State Street at James Street (PM peak hour)
- US 11/S. State Street at NY 5/Erie Boulevard E. (PM peak hour)
- N./S. McBride Street at NY 5/Erie Boulevard E. (PM peak hour)
- Almond Street/Catherine Street at NY 5/Erie Boulevard E. (PM peak hour)
- Almond Street at Harrison Street (AM peak hour)
- N. /S. Crouse Avenue at Erie Boulevard. E. (AM and PM peak hours)
- S. Crouse Avenue at E. Water Street (PM peak hour)
- Irving Avenue at Van Buren Street (AM peak hour)

**Table 5-68**
**Intersection LOS During Community Grid Construction Phase 2B without Improvements**

| ID | Name | 2020 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West Street at NY 5/W. Genesee Street | 50.3 | D | 51.3 | D |
| D-10 | Wallace Street at NY 5/W. Genesee Street | 813.3 | F | 104.1 | F |
| D-13 | N. Franklin Street at NY 5/W. Genesee Street | 30.2 | C | 113.0 | F |
| D-21 | N. Clinton Street at NY 5/W. Genesee Street | 47.3 | D | 35.7 | D |
| D-31 | N. Salina Street at SB I-81 Off-ramp | 134.1 | F | 10.8 | B |
| D-32 | N. Salina Street at Herald Place | 26.5 | C | 28.5 | C |
| D-33 | N. Salina Street at E./W. Willow Street | 5.9 | A | 5.3 | A |
| D-34 | N. Salina Street at NY 5/W. Genesee St./James Street | 57.0 | E | 15.7 | B |
| D-46 | Pearl Street at Hickory Street | 39.2 | E | 694.4 | F |
| D-49 | N. Warren Street at NY 5/James Street | 12.5 | B | 9.0 | A |
| D-58 | Oswego Boulevard at James Street | 2.0 | A | 0.8 | A |
| D-59 | NY 5/Oswego Boulevard/ at Montgomery Street | 16.2 | B | 19.2 | B |
| D-70 | US 11/N. State Street at James Street | 22.2 | C | 90.9 | F |
| D-71 | US 11/S. State Street at NY 5/Erie Boulevard E. | 19.7 | B | 104.3 | F |
| D-84 | N./S. Townsend Street at NY 5/ Erie Boulevard E. | 18.6 | B | 54.1 | D |
| D-93 | N./S. McBride Street at NY 5/Erie Boulevard E. | 16.3 | B | 72.6 | E |
| D-100 | Almond Street/Catherine Street at NY 5/Erie Blvd E. | 54.1 | D | 90.0 | F |
| D-107 | Almond Street at Harrison Street | 56.0 | E | 48.0 | D |
| D-108 | Almond Street at E. Adams Street | 36.9 | D | 44.2 | D |
| D-109 | Almond Street at Burt Street | 7.7 | A | 8.9 | A |
| D-110 | Almond Street at Van Buren Street | 12.2 | B | 14.6 | B |
| D-122 | Almond Street and MLK Jr. E. | 8.8 | A | 17.1 | B |
| U-1 | N. Crouse Avenue at Burnet Avenue | 18.5 | B | 22.8 | C |
| U-10 | N. /S. Crouse Avenue at Erie Boulevard. E. | 116.7 | F | 373.5 | F |
| U-19 | S. Crouse Avenue at E. Water Street | 9.3 | A | 57.1 | E |
| U-63 | Irving Avenue at Van Buren Street | 333.2 | F | 13.5 | B |
| U-68 | Crouse Avenue at Westbound I-690 | 39.1 | D | 20.9 | C |
| U-70 | Irving Avenue at Erie Boulevard | 10.4 | B | 15.9 | B |
| U-71 | Irving Avenue at Water Street | 11.4 | B | 14.4 | B |

To address congestion under the construction scenario, several temporary roadway improvements were developed (see **Table 5-69**). In addition, traffic signal modifications would be introduced at intersections along affected corridors to facilitate traffic flow and promote signal coordination. Peak hour LOS for intersections under construction conditions with proposed improvements are shown in **Table 5-70**. With the proposed improvements, most intersections would operate acceptably, with the exception of N. Franklin Street at NY 5/W. Genesee Street and N. /S. Crouse Avenue at Erie Boulevard. Although both

intersections would operate at LOS E in the PM peak hour, the proposed improvements would substantially reduce delay at these locations by 47 and 79 percent respectively.

**Table 5-69**
**Community Grid Alternative: Phase 2B Local Street Improvements**

| Location | Temporary Mitigation Measures/Improvements | Permanent Mitigation Measures/Improvements |
|---|---|---|
| I-81 Northbound on-ramp from Pearl Street | Add second lane starting from the intersection of Pearl and Hickory Streets, continue both lanes | Provide two lane on-ramp |
| Intersection of Pearl and Hickory Streets | Install temporary signal | Reconstruct Pearl and Hickory as a stop controlled intersection |
| Intersection of Pearl and Hickory Streets | Restripe northbound approach to serve: 1) left turns; and 2) left turns, through traffic and right turns | Reconstruct intersection to allow two free flowing lanes from Pearl Street to connect to Northbound I-81 on-ramp |
| Intersection of I-81 southbound off-ramp and Salina Street | Install temporary signal | Remove Southbound I-81 off-ramp to Salina Street |
| Genesee Street westbound between Franklin and Wallace Streets | Remove parking lane, provide two westbound travel lanes | Restore current configuration |
| Genesee and Wallace Streets | Restripe westbound approach to serve: 1) left turns and through traffic; and 2) through traffic and right turns | Restore current configuration |
| Genesee and Franklin Streets westbound approach | Remove parking (approx. 75') to create an auxiliary through lane | Restore current configuration |
| Genesee and Franklin Streets westbound approach | Restripe westbound approach to serve: 1) left turns and through traffic; and 2) through traffic and right turns | Restore current configuration |
| Erie Boulevard and State Street | Create a right turn bay and stripe westbound approach to serve: 1) left turns; 2) through traffic in a single lane; and 3) dual right turns | Maintain additional turn bay and restripe westbound approach to serve: 1) left turns; 2) through traffic in two dedicated lanes; and 3) right turns in a single turn bay |
| Erie Boulevard and Crouse Avenue | Restripe eastbound approach to serve: 1) dual left turns; and 2) through traffic and right turns | Restore eastbound approach to current striping |
| Crouse Avenue between Water Street and Erie Boulevard | Create a third northbound travel lane for a total width of five lanes in this section | Provide two northbound travel lanes for a total width of four lanes in this section |
| Erie Boulevard and Crouse Avenue | Stripe northbound approach to serve: 1) left turns and through traffic; 2) through traffic; and 3) through traffic and right turns | Restripe northbound approach to serve: 1) left turns and through traffic; and 2) through traffic and right turns |
| Crouse Avenue and Water Street | Create a third northbound lane starting approx. 100 feet south of the northbound stop bar | Provide two northbound travel lanes for a total width of four lanes in this section |
| Erie Boulevard and Crouse Avenue | Stripe northbound approach to serve: 1) left turns and through traffic; 2) through traffic; and 3) through traffic and right turns | Restripe northbound approach to serve: 1) left turns and through traffic; and 2) through traffic and right turns |

**Table 5-69**
**Community Grid Alternative: Phase 2B Local Street Improvements**

| Location | Temporary Mitigation Measures/Improvements | Permanent Mitigation Measures/Improvements |
|---|---|---|
| Crouse Avenue between Erie Boulevard and eastbound on-ramp to I-690 | Create a third northbound travel lane for a total width of five lanes in this section | Provide two northbound travel lanes for a total width of four lanes in this section |
| Crouse Avenue and eastbound on-ramp to I-690 | Prohibit southbound left turns | Allow southbound left turns |
| Crouse Avenue and eastbound on-ramp to I-690 | Restripe northbound approach to serve: 1) through traffic; 2) through traffic and right turns; and 3) right turns | Restripe northbound approach to serve: 1) through traffic; and 2) through traffic and right turns |
| Crouse Avenue and eastbound on-ramp to I-690 | Provide two lanes from intersection continuing onto the interstate | Provide a two lane on-ramp which merges to a single lane before entering the interstate |

**Table 5-70**
**Intersection LOS During Community Grid Construction Phase 2B with Improvements**

| | | 2020 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| ID | Intersection Name | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| D-1 | N. West Street at NY 5/W. Genesee Street | 43.7 | D | 34.5 | C |
| D-10 | Wallace Street at NY 5/W. Genesee Street | 40.2 | D | 20.8 | C |
| D-13 | N. Franklin Street at NY 5/W. Genesee Street | 28.5 | C | 59.8 | E |
| D-21 | N. Clinton Street at NY 5/W. Genesee Street | 30.9 | C | 20.1 | C |
| D-31 | N. Salina Street at SB I-81 off-ramp | 50.6 | D | 4.2 | A |
| D-32 | N. Salina Street at Herald Place | 25.8 | C | 25.5 | C |
| D-33 | N. Salina Street at E./W. Willow Street | 2.9 | A | 4.2 | A |
| D-34 | N. Salina Street at NY 5/W. Genesee Street/James Street | 39.0 | D | 15.5 | B |
| D-46 | Pearl Street at Hickory Street | 23.3 | C | 25.3 | C |
| D-49 | N. Warren Street at NY 5/James Street | 14.4 | B | 10.9 | B |
| D-58 | Oswego Boulevard at James Street | 2.0 | A | 0.7 | A |
| D-59 | NY 5/Oswego Boulevard/ at Montgomery Street | 16.2 | B | 20.5 | C |
| D-70 | US 11/N. State Street at James Street | 22.2 | C | 33.4 | C |
| D-71 | US 11/S. State Street at NY 5/Erie Boulevard E. | 19.7 | B | 27.2 | C |
| D-84 | N./S. Townsend Street at NY 5/Erie Boulevard E. | 17.4 | B | 25.9 | C |
| D-93 | N./S. McBride Street at NY 5/Erie Boulevard E. | 18.1 | B | 17.1 | B |
| D-100 | Almond Street/Catherine Street at NY 5/Erie Blvd E. | 11.6 | B | 17.4 | B |
| D-107 | Almond Street at Harrison Street | 42.0 | D | 48.0 | D |
| D-108 | Almond Street at E. Adams Street | 28.1 | C | 44.2 | D |
| D- | Almond Street at Burt Street | 7.7 | A | 8.9 | A |

**Table 5-70**
**Intersection LOS During Community Grid Construction Phase 2B with Improvements**

| ID | Intersection Name | 2020 | | | |
|---|---|---|---|---|---|
| | | AM | | PM | |
| | | Delay (sec/veh) | LOS | Delay (sec/veh) | LOS |
| 109 | | | | | |
| D-110 | Almond Street at Van Buren Street | 11.9 | B | 14.6 | B |
| D-122 | Almond Street and MLK Jr., E. | 8.8 | A | 17.1 | B |
| U-1 | N. Crouse Avenue at Burnet Avenue. | 18.8 | B | 20.7 | C |
| U-10 | N. /S. Crouse Avenue at Erie Boulevard. E. | 30.0 | C | 79.6 | E |
| U-19 | S. Crouse Avenue at E. Water Street | 9.4 | A | 7.1 | A |
| U-63 | Irving Avenue at Van Buren Street | 24.9 | C | 13.5 | B |
| U-68 | Crouse Avenue at Westbound I-690 | 16.2 | B | 21.2 | C |
| U-70 | Irving Avenue at Erie Boulevard | 8.9 | A | 14.2 | B |
| U-71 | Irving Avenue at Water Street | 18.3 | B | 10.9 | B |

In addition to the Phase 2B improvements discussed above, a comprehensive Traffic Management Plan will be developed for the selected alternative. The Traffic Management Plan would comprise all major construction phases and sub-phases, as well as system-wide measures to efficiently and safely serve the needs of the Project Area; reduce traffic volumes during construction; minimize traffic diversions to local streets and other routes; and ensure compatibility with the social, economic, and land use character of the Project Area. Potential measures to be evaluated may include:

- Implementation of expanded and improved Intelligent Transportation Systems
- Continued refinement of construction staging
- Expanded highway traffic enforcement
- Additional local arterial traffic operations improvements
- Expanded local arterial traffic enforcement
- Pedestrian improvement measures
- Park-and-ride facilities
- Rideshare action plan
- Truck routing measures
- Information telephone hotline
- Media campaign
- Public involvement program
- Signal Retiming
- Planned and Unplanned Traffic Incident Management
- Transportation Demand Management measures (e.g., guaranteed ride home, car sharing, and carpool matching)

- Creating additional bus routes or adding buses to existing routes

**Impacts on Police, Fire Protection and Ambulance Access**

The Community Grid Alternative would not adversely impact ambulance access or police and fire protection overall. Traffic analyses show improved level of service within the project limits.

St. Joseph's hospital would benefit from more-direct high-speed access via the southbound former I-81 exit ramp at Oswego Boulevard. Reduced congestion at the Almond Street intersections with Harrison and Adams Streets would improve mobility on the local street network through the geographic center of the city. The conversion of Harrison Street west of Almond Street, Adams Street west of State Street, and Crouse Avenue south of Genesee Street to two-way operation would provide emergency responders with many additional routing options.

Travel times to and from points south of the downtown area are expected to increase moderately under the Community Grid Alternative. However, a new intersection created at Almond Street and Van Buren Street would improve connectivity to the major Hospitals on University Hill from points south, reducing travel distances and partially offsetting the impact of lower travel speeds through the area.

Peak hour travel times within the project area and along popular routes used by emergency responders would decrease compared to the No Build condition in most cases.

**Constructability Review**

An initial constructability review workshop was conducted during preliminary design to evaluate current alternative designs and staging schemes, to identify potential constructability issues and innovative means and methods that may apply, identify additional construction related impacts, identify potential for additional right-of-way impacts and evaluate the overall project schedule to identify strategies that will improve constructability while accelerating the overall construction schedule. As a result of this workshop, it was determined that the Community Grid Alternative is constructible, and there were no major concerns regarding additional right-of-way.

A major outcome of the workshop was a result of the construction schedule evaluation. The committee identified multiple construction schedules based on the degree to which traffic could be detoured. To a large extent, it was determined that identifying strategies to reduce the overall project schedule also resulted in improving constructability, but also caused a larger impact to traffic. The most aggressive schedule identified for the Community Grid Alternative was a five-year schedule. As detailed in Chapter 4, a five-year schedule would only be possible through use of longer-term shutdowns of interstate segments. By employing a strategy that takes a section of interstate out of service for an extended period of time, more work can be fully built out in one phase, thus the number of construction stages is dramatically reduced, productivity increases, the overall timeframes are reduced and the constructability improves.

- As noted, the constructability workshop was conducted early in preliminary design. It is anticipated that as design progresses, a formal, independent constructability review will be conducted according to NYSDOT policy. The constructability review will be performed by an Independent Review Team and would be coordinated with a Value Engineering review.
- Parking Regulations and Parking-related Issues
- Once completed, the I-81 Viaduct Project would not further affect parking supply and demand beyond its construction year of 2020. The Project itself, regardless of the alternative, will not change parking supply or demand once it is built (e.g., the Project will not require supply changes nor will it generate parking demand in the future) between 2020 and 2050. Therefore, future parking supply and demand was evaluated for 2020, but not 2050. Information was gathered to estimate parking supply and demand changes by 2020 due to known development projects through internet research and coordination with a number of local agencies and other stakeholders. It is assumed that any future parking demand generated beyond 2020 would not be a result of the I-81 Viaduct Project and will be accommodated as part of any future development processes through zoning requirements and/or market demand.

The effects on parking within the I-81 Viaduct Study Area were determined based on the preliminary design for the Community Grid Alternative. If the affected area encompassed a parking facility or building that generates parking demand, it was noted along with the impacts to parking supply. It was conservatively assumed, for the purpose of this analysis, that any supply within the affected area would be lost. For example, it was assumed that all existing parking beneath the viaduct would be lost and no new parking supply would be included. Any potential reintroduction of parking, post construction, will be addressed as part of mitigation measures.

The anticipated work may affect an entire parcel (building and parking area), the building only, the parking area only, or a portion of the parking on-site. For this analysis, a loss of a building resulted in the loss of demand and the loss of a parking facility resulted in the loss of supply. Based on the preliminary design, approximate estimates (25, 50, 75, or 100 percent loss) were made for the amount of parking supply lost or demand affected. New on-street parking supply would be included on Almond Street between Water and Adams Street, portions of Warren Street, Oswego Boulevard, and West Street, on the proposed extensions of Oswego Boulevard and Pearl Street, and some existing on-street parking would be replaced along Genesee Street and Erie Boulevard. The associated change in supply and demand was applied to the future no build supply and demand to provide the estimated future year supply and demand.

With implementation of the Community Grid Alternative, an estimated 36 off-street parking facilities, along with a number of on-street spaces, would be affected to some degree. Most of the off-street facility disturbances would be adjacent to or beneath the existing viaduct. Most of the on-street parking loss would occur on the roadways that would accommodate the anticipated distribution of traffic onto other local streets such as Genesee Street, Erie Boulevard, Irving Avenue, and Crouse Avenue. Overall, the loss of supply is estimated to be

approximately 2,000 spaces and the reduction in demand would be approximately 130 spaces. However, the Community Grid Alternative includes the addition of approximately 470 on-street parking spaces. As shown in **Table 5-71** below, parking supply in 2020 would be 83 percent utilized under the Community Grid Alternative, a four percent increase from No Build conditions. Since the I-81 Viaduct Project would not affect parking beyond its construction year (2020), future parking supply and demand was not evaluated beyond 2020. As noted in Section 5.3, the effective supply is the overall supply reduced for planning purposes to account for user familiarity and potential weather impacts. More detailed information is included in **Appendix C-5**.

**Table 5-71**
**Community Grid Parking Supply and Demand Summary**

| | Change in Supply | Supply | Effective Supply | Change in Demand | Demand | Utilization |
|---|---|---|---|---|---|---|
| Existing Conditions | - | 29,233 | 26,808 | - | 21,064 | 79% |
| 2020 Future No Build | 2,149 | 31,382 | 28,779 | 1,782 | 22,846 | 79% |
| 2020 Future Build | -1,561 | 29,821 | 27,347 | -131 | 22,715 | 83% |

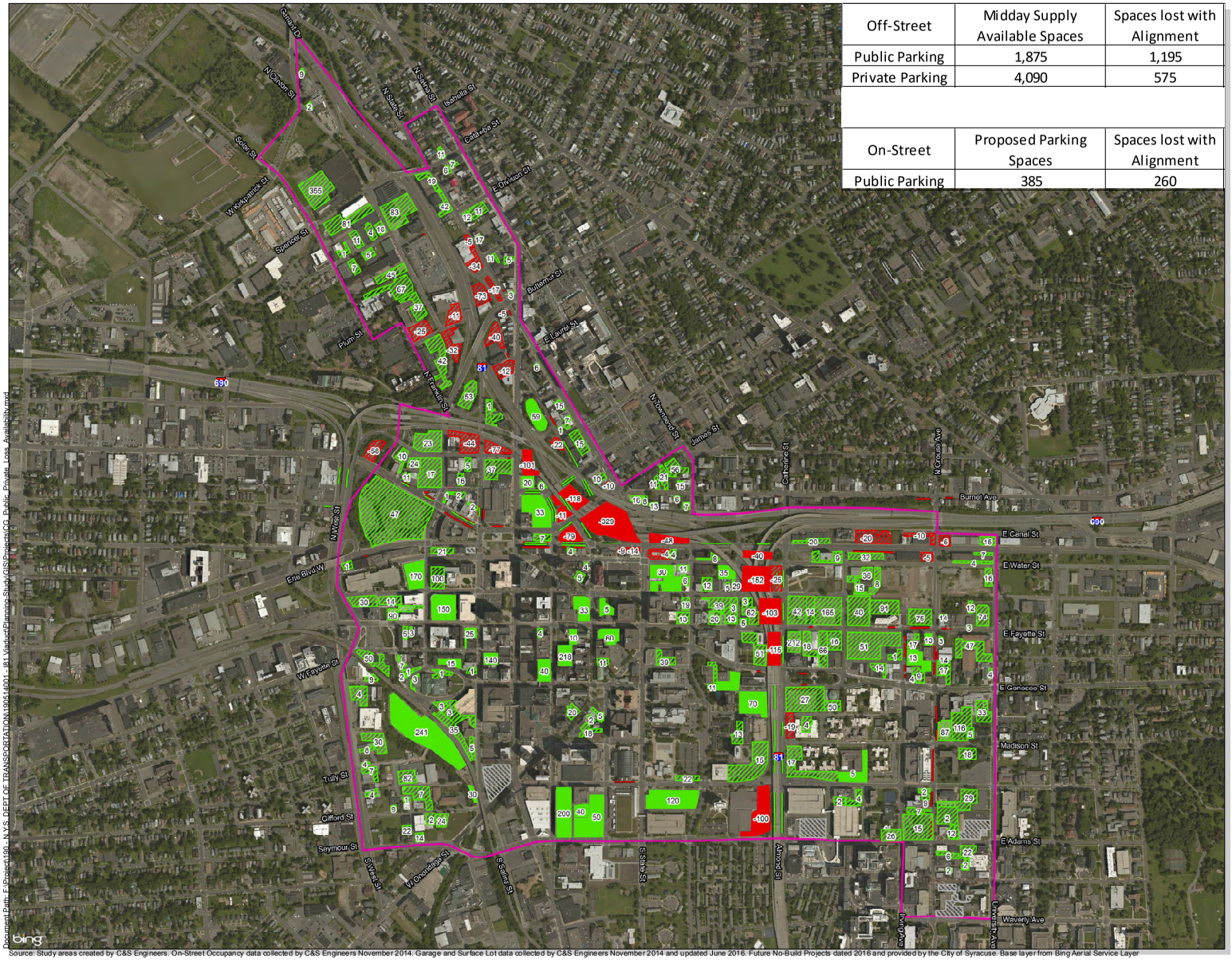
While the entire study area would have sufficient supply to accommodate demand, the geographic distribution of available parking may not align with the distribution of demand. As shown in **Figure 5-16**, there would be a disproportionate loss of parking along the I-81 alignment. It was assumed that the majority of motorists generally are willing to walk up to ¼ mile from there parking facility to their final destination. Therefore, there is a need to identify or provide available parking within the general vicinity of the parking loss.

The Community Grid Alternative would result in a loss of approximately 1,215 spaces in public off-street parking facilities and 555 spaces in private off-street facilities. There also would be a net gain of approximately 210 public on-street spaces. For the purposes of this analysis, public facilities are those where the public can purchase the rights to park regardless of the owner of the facility. A private facility is one on privately held land and is available only to employees or visitors of a specific building or institution. With regard to loss in supply, any parking facility owned by a municipality or public agency is considered public, even if it is only open to employees and not the general public. In terms of available supply, it was assumed that any parking owned by University Hill institutions that are for their employees, patients, or visitors are considered private.

Mitigation for parking impacts varies for public versus private facilities. Impacts to private facilities will be mitigated through the real estate process and will comply with the New York State Eminent Domain Procedure Law (Articles 1 through 7).

Potential mitigation measures to address the reduction in public parking supply (1,215 spaces) include a combination of the following:

- Implementation of transportation demand management (TDM) measures to reduce the demand for parking (refer to recommendations in the Syracuse Metropolitan Transportation Council Downtown Syracuse TDM Study),




| Off-Street | Midday Supply Available Spaces | Spaces lost with Alignment |
|---|---|---|
| Public Parking | 1,875 | 1,195 |
| Private Parking | 4,090 | 575 |

| On-Street | Proposed Parking Spaces | Spaces lost with Alignment |
|---|---|---|
| Public Parking | 385 | 260 |

**Legend**

- Study Area

On-Street Parking

- Proposed On-Street Parking
- Impacted On-Street Midday Supply

Off-Street Parking

- Available Private Parking
- Available Public Parking
- Loss of Private Parking
- Loss of Public Parking
- Loss of Parking for Future No Build Projects

* Available off-street parking labeled by midday available spaces
* Loss of off-street parking labeled by total spaces

N

500 250 0 500 Feet

1" = 450'
When printed at 22" x34"

Source: Study areas created by C&S Engineers. On-Street Occupancy data collected by C&S Engineers November 2014. Garage and Surface Lot data collected by C&S Engineers November 2014 and updated June 2016. Future No-Build Projects dated 2016 and provided by the City of Syracuse. Base layer from Bing Aerial Service Layer

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# Community Grid Alignment with Affected Parking Areas

**Figure 5-16**

- Maximize the available public parking within the **I-81 Viaduct S**tudy Area through promotion of available parking, improving the pedestrian environment and/or provision of shuttle services,
- replacement of parking supply under I-81 and I-690, and
- development of new parking supply in the form of surface lots or parking garages.

To identify if parking loss could be mitigated using these measures, estimates were made regarding location and size of the currently available or potential new parking facilities. Surveys of Syracuse employees indicate they typically are willing to walk ¼ mile from where they park to their destination. This provides a reference for considering available existing parking and locations for new or replacement parking to be considered to mitigate losses within a reasonable distance. An additional 0.1 mile beyond the ¼ mile area also was considered to account for the distribution of demand within the ¼ mile radius and potential spaces that could be used as mitigation if infrastructure improvements were available to encourage users to park farther away from where they park now.

**Figures 5-16 and 5-17** show the parking losses divided into three geographic areas (upper, middle, and lower) along with potential mitigation options. **Table 5-72** summarizes the potential to mitigate the parking loss through:

- The use of existing available public parking supply (1,175 spaces),
- Potential replacement of parking below I-81 and I-690 (1,300 spaces),
- The development of new surface parking lots (380 spaces), and
- The development of new garages (735-1,470 spaces).

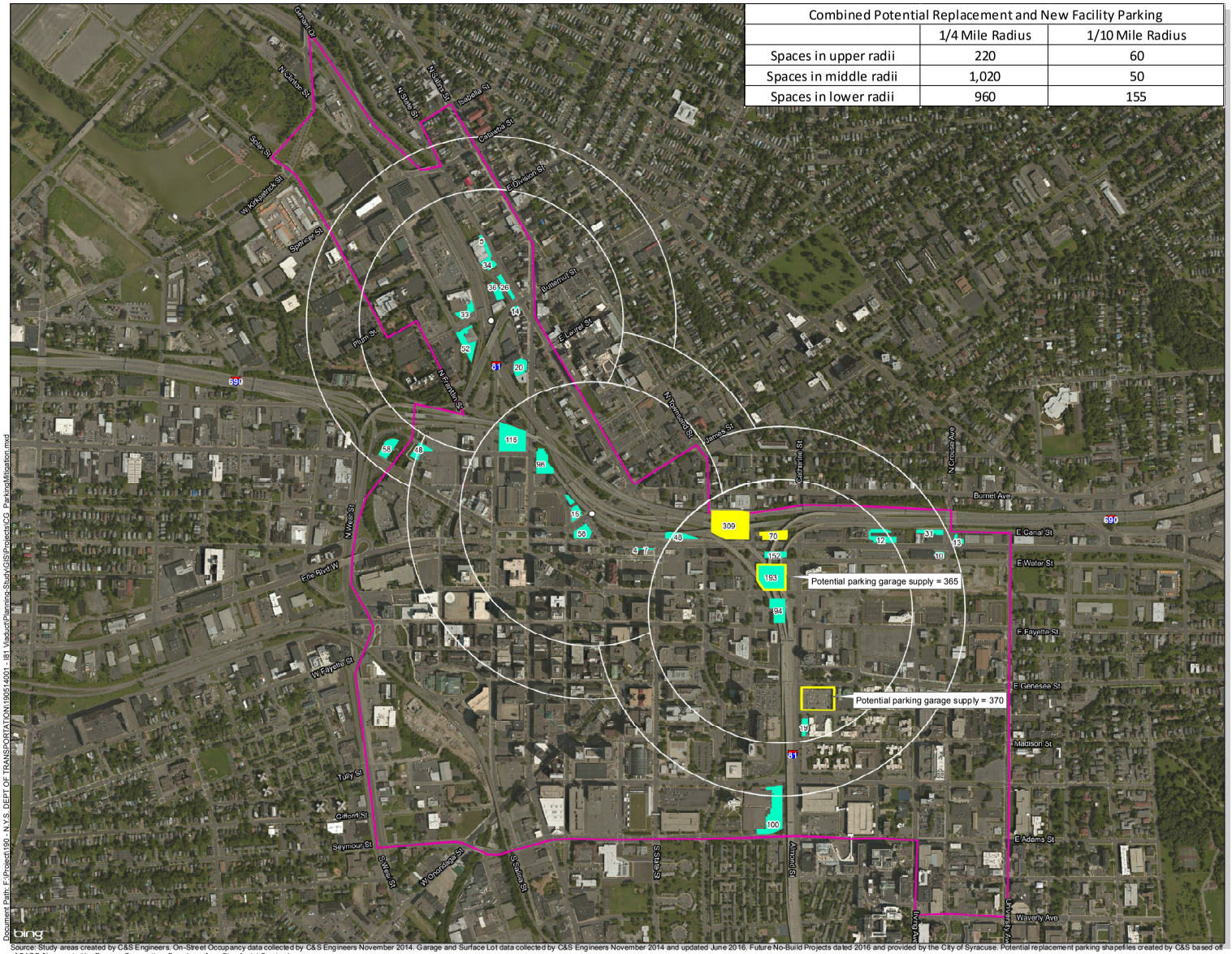
While the northernmost potential garage (an existing surface parking lot providing 193 spaces) location is slightly beyond the middle geographic area's ¼-mile radius, it is located within ¼ mile of the New York State Office Building (333 E. Washington Street) which is the major parking generator that is anticipated to require parking mitigation. Therefore, it is assumed that this location would be suitable for a parking garage that could mitigate adverse parking effects in the area.

**Table 5-72**
**Community Grid Alternative Mitigation Summary**

| Area (1/4 mile radii + additional 0.1 mile) | Loss of Public Spaces | Available Public Spaces (Figure 5-16)[1] | Potential Replacement Spaces (Figure 5-17) | New Potential Surface Lots (Figure 5-17) | New Potential Garages (Figure 5-17)[2] | Total Possible Mitigation Spaces[2] |
|---|---|---|---|---|---|---|
| Upper | 0 | 0 | 280 | 0 | 0 | 280 |
| Middle | 640 | 980 (440) | 345 | 310 | 365 | 2,000 |
| Lower | 575 | 195 (165) | 675 | 70 | 370 | 1,310 |
| Total | **1,215** | 1,175 (605) | 1,300 | 380 | 735 | **3,590** |

**Notes:**
1 – ¼ mile radius + 0.1 mile (¼ mile radius only)
2 – Potential spaces associated with new garages based on 2 floors of parking

| Combined Potential Replacement and New Facility Parking | | |
|---|---|---|
| | 1/4 Mile Radius | 1/10 Mile Radius |
| Spaces in upper radii | 220 | 60 |
| Spaces in middle radii | 1,020 | 50 |
| Spaces in lower radii | 960 | 155 |




**Legend**

- Study Area

Off-Street Parking

- Potential replacement parking labeled by potential parking supply
- Potential new surface lots labeled by potential parking supply
- Potential Parking Garages*

*Note - Potential supply associated with potential parking garages assumes two floors per garage.

N

500 250 0 500 Feet

1" = 450'
When printed at 22" x34"

Community Grid Alignment
Potential Replacement and
New Surface Lot Parking

Source: Study areas created by C&S Engineers. On-Street Occupancy data collected by C&S Engineers November 2014. Garage and Surface Lot data collected by C&S Engineers November 2014 and updated June 2016. Future No-Build Projects dated 2016 and provided by the City of Syracuse. Potential replacement parking shapefiles created by C&S based off of CADD files created by Parsons Corporation. Base layer from Bing Aerial Service Layer

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Community Grid Alignment
Potential Replacement Parking

**I-81 Viaduct Project**

**Figure 5-17**

The potential mitigation measures could provide a total of 3,590 spaces, which is more than needed to address the loss of 1,215 spaces. The potential mitigation measures identified provides flexibility in the final selection of a combination of mitigation measures to be further defined through coordination with the City of Syracuse, NYSDOT, and other agencies and entities.

### Lighting

Under the Community Grid Alternative, all existing highway lighting within the I-81 Viaduct Study Area would need to be replaced. This would include lighting along I-81, from south of the Martin Luther King East bridge to the vicinity of Bear Street. It is anticipated that the existing high mast lighting in the vicinity of Hiawatha Boulevard would remain. Similarly, the existing highway lighting along I-690, between Leavenworth Avenue and Lodi Street, would be replaced.

In addition to lighting on the highway, replacement lighting would be provided on reconstructed city streets, as well as beneath bridges, sidewalks, and shared-use (bicycle and pedestrian) paths. Gateway and special area lighting also would be possible. Lighting on controlled access facilities and local streets are consistent with lighting warrants in Chapter 12 of the Highway Design Manual and NYSDOT's "Policy of Highway Lighting". Local lighting upgrades will require that the City of Syracuse consents to assume operational and maintenance costs for all future lighting installations. This agreement shall be confirmed when design advances.

Roadway lighting is constantly changing due to changes in technology and other factors that are associated with outdoor lighting. Some of the issues to be concerned with are related to lighting pollution that is created by glare, light trespass, and urban sky glow. Lighting glare causes reduced visual performance, which reduces the ability of the driver to distinguish objects clearly. Lighting options considered should be of low vertical illuminance and increasing the mounting height and the spacing between poles.

Light trespass and urban sky glow is allowing roadway lighting to illuminate the areas along a roadway with the light that is around the light pole. This may illuminate residential areas and affect the performance of security cameras in commercial areas. Fixtures in the above areas should consider cut-off technology or shields to minimize the amount of light trespass and sky glow. Another factor to consider is energy consumption. The cost of energy consumption is a real cost to the owner of the light fixtures, and with improvements in technology, coupled with reduced maintenance costs due to a long life expectancy, LED street light fixtures are proving to be a viable option that could be considered as an option.

Replacement highway lighting would be designed based on NYSDOT recommended values for Freeway A, Type R3 Pavement, and summarized in **Table 5-73.**

**Table 5-73**
**Community Grid Alternative - Recommended Lighting Values: Luminance**

| Item | DOT Recommended Value | Calculated Value (1) |
|---|---|---|
| Avg. Illuminance (cd/m2) | ≥0.6 | 0.6 |
| Uniformity (Ave/Min Ratio) | ≤3.5 | 1.6 |
| Uniformity (Max/Min Ratio) | ≤6.0 | 3.8 |
| Veiling Luminance Ratio | ≤0.3 | 0.3 |
| Small Target Visibility | 3.2 | 2.4 |

**Note:**
1) The calculated values were determined using the aid of Visual Lighting Software's Roadway tool. For the purposes of this analysis, the fixture was assumed to be a Lithonia, type DSX1 60LED with 700mA driver, Type 5 distribution at 4000°K. The calculations were performed using one side of the Freeway, with 4 lanes @12' per lane with a 10' median, type R3 pavement, with a fixture height of 30'. The optimal spacing of the fixture in order to achieve the IES recommended values, which are shown on the table above, was calculated to be 240' spacing per side, with fixtures staggered at 120'.

In addition to highway lighting, it is expected that replacement lighting would be provided on city streets that are reconstructed, as well as under bridge lighting, sidewalk and shared-use (bicycle and pedestrian) paths lighting, gateway and special area lighting. Design criteria for additional lighting classifications are summarized in **Table 5-74**.

Replacement lighting for city streets, sidewalks, shared-use (bicycle and pedestrian) paths and special use lighting under this alternative would be subject to approval by the City of Syracuse and may require modification or establishment of special lighting districts. Special Lighting Districts are those areas in the City that have petitioned the Common Council to allow for street lighting different than standard lighting, and may typically be identified by decorative features or underground wiring. With the benefit of this special lighting come additional costs which are placed on the tax bills of the property owners within these districts. Even replacement of existing luminaires with LED luminaires would need to be approved through a special lighting district. Any modifications other than standard High Pressure Sodium luminaires on utility poles, would require a public vote for the City to accept it. On a typical highway project, the state would pay the cost of installing replacement light fixtures, and the cost for maintenance would either be by National Grid through a tariff rate or the City of Syracuse would be responsible for maintenance.

**Table 5-74**
**IES Recommended Horizontal Illumination of Roadways and Walkways**

| Seeing Task | Classification of Area | |
|---|---|---|
| **Vehicular Roadways** | **Commercial** | **Residential** |
| Local Roadway/City Street | 0.9 FC | 0.4 FC |
| Pedestrian Walkways/Shared-use | | |
| Sidewalks | 0.9 FC | 0.2 FC |

### Ownership and Maintenance Jurisdiction

Under the Community Grid Alternative, NYSDOT would continue ownership and maintenance responsibilities for the Interstate Highway System. In addition, NYSDOT would retain ownership of the arterials listed in **Table 5-20** and would continue to contract with the City of Syracuse for the maintenance of these facilities.

With removal of the I-81 viaduct between the railroad and I-690, NYSDOT would retain ownership of former I-81 between the south I-81/I-481 interchange and Martin Luther King East. For the portion of the highway between MLK. Jr., East and Burnet Avenue, NYSDOT and the City of Syracuse are coordinating to determine the ownership and maintenance roles.

It is anticipated NYSDOT would own and maintain the ramps at the new I-690 interchange at Crouse and Irving Avenues and that the City of Syracuse would own and maintain Crouse and Irving Avenues. The ownership and maintenance responsibilities for all other local roads would remain the same under this alternative.

A maintenance agreement with the City of Syracuse will be necessary to facilitate energizing and maintenance of any new lighting constructed along city streets as well as the state-owned lighting along I-81 and I-690.

## MULTIMODAL

### Pedestrians

Pedestrians will continue to be prohibited on I-690, I-81, and I-481 by state law.

Pedestrian facilities would be reconstructed along all city streets that are impacted by this alternative and would be designed consistent with New York State Complete Streets legislation, and to meet current ADA and NYSDOT standards.

In accordance with the Project's objectives, the Community Grid Alternative would result in improved pedestrian accommodation, connectivity, and safety. Pedestrian facilities would be provided on both sides of Almond Street from Burnet Avenue to Martin Luther King Jr., East, thereby eliminating the existing gaps, which would remain under the No Build Alternative. Pedestrian safety and comfort would be improved on Almond Street, with a narrower roadway, curb bump outs at intersections, and a protected median. Pedestrian crossing distances on Almond Street would be narrower, and will be more visible to motorists than in the existing condition and under the No Build Alternative.

Pedestrian connectivity between the Downtown and University Hill neighborhoods would be improved by providing crosswalks for all pedestrian movements at the Harrison Street and Adams Street intersections. Pedestrian refuge areas with protective bollards will be provided where crosswalks pass through raised median areas on Almond Street. Between Adams Street and Erie Boulevard, bump outs will be provided to narrow east-west pedestrian crossings of Almond Street. At the Almond Street intersections with Jackson Street, Taylor Street, Burt Street, and Van Buren Street, crosswalks will be provided to facilitate pedestrian east-west connectivity.

The railroad bridge that carries the New York Susquehanna and Western Railroad over Renwick Avenue would be rebuilt and lengthened, allowing a shared-use (bicycle and pedestrian) path beneath the bridge on the west side and a sidewalk with buffer beneath the bridge on the east side. These improvements would provide safe pedestrian and bicycle access and improve pedestrian connectivity between the Southside, Downtown, and University Hill where none currently exists or would exist under the No Build Alternative.

The removal of the overpass at West Street and West Genesee Street would allow for several pedestrian enhancements in the area, including providing sidewalks where there are currently gaps in pedestrian connectivity. Pedestrian sidewalks would be provided on the east side of West Street between Genesee Street and Erie Boulevard, and on the north side of Genesee Street between Plum Street and West Street where none currently exists or would exist under the No Build Alternative. Crosswalks at West Street and Genesee Street would utilize medians to provided protected pedestrian refuges. A new shared-use (bicycle and pedestrian) path would be provided on the west side of Onondaga Creek where none currently exists or would exist under the No Build Alternative. Americans with Disabilities Act (ADA)-compliant curb ramps and crosswalks, and pedestrian signals with push buttons, and sidewalks, would be provided throughout the project limits. These facilities would improve pedestrian safety and enhance pedestrian connections in the local street network within the Project Area and improve connectivity between the Park Avenue neighborhood, the Onondaga Creekwalk, the Downtown business district, and other key destinations. Refer to **Chapter 3: Description of Alternatives**, for a detailed description of proposed bicycle facilities.

**Bicyclists**

Bicyclists will continue to be prohibited on I-690, I-81 and I-481 by state law.

The *Syracuse Bike Plan*, a section of the *Syracuse Comprehensive Plan 2040,* lays out a detailed vision for an interconnected bike network throughout the city. This Project builds on the city's vision of a bike network that provides connectivity between neighborhoods, the Downtown business district, and other key destinations. Facilities would be developed consistent with *AASHTO Guide for the Development of Bicycle Facilities 2012 Fourth Edition* and New York State Complete Streets legislation

The Community Grid Alternative would result in improved bicycle accommodation, connectivity, and safety. A new dedicated bicycle facility would be provided on Almond Street between Burnet Avenue and Martin Luther King Jr., East where none currently exists or would exist under the No Build Alternative. From Burnet Avenue to Erie Boulevard, one way bike lanes would be provided on each side of Almond Street; from Erie Boulevard to Adams Street one way raised cycle tracks would be provided on each side of Almond Street; and from Adams Street to Martin Luther King Jr., East a shared-use (bicycle and pedestrian) path would be provided on the west side of Almond Street. One-way bike lanes would be provided on both sides of Martin Luther King Jr., East between Almond Street and Leon Street. This new bicycle facility on Almond Street would connect to a new shared-use (bicycle and pedestrian) path between Van Buren Street and Raynor Avenue that would be

separated from the highway and provide improved connectivity from the Southside, Downtown, and University Hill.

The railroad bridge that carries the NYS&W over Renwick Avenue would be rebuilt and widened to provide for the shared-use (bicycle and pedestrian) path to pass beneath the bridge on the west side allowing for bicycle accommodation where none currently exists or would exist under the No Build Alternative.

Harrison Street, which would be reconstructed from Almond Street to Townsend Street, would be converted from a one-way to a two-way street between Almond Street and Salina Street. One-way raised cycle tracks would be provided on both sides of Harrison Street between Almond Street and Townsend Street. Between Townsend Street and Warren Street, one-way bicycle lanes would be provided on both sides of the street. Between Warren Street and Salina Street, shared lane markings would be provided. A raised two way cycle track would be provided on the west side of Salina Street between Laurel Street and Herald Place; a raised two way cycle track would be provided on State Street between James Street and the Erie Canalway Trail on Water Street and on Crouse Avenue between Burnet Avenue and the Erie Canalway Trail on Water Street. Bike lanes would be provided on Lodi Street between Burnett Avenue and Canal Street and connecting to the Erie Canalway trail on Water Street via shared lane markings on Canal Street and Walnut Street where none currently exists or would exist under the No Build Alternative. One-way bike lanes on each side of the street would be provided on the new Butternut Street Bridge that would connect to proposed facilities on Salina and State streets to the east, and to a new shared-lane facility on Franklin Street to the west. The new Franklin Street facility would connect to a new facility on Evans Street, and the Evans Street facility would connect to a new shared-use (bicycle and pedestrian) path on the west side of Onondaga Creek. A new shared-use (bicycle and pedestrian) path would be provided to connect the existing Onondaga Creekwalk to the intersection of Franklin Street, Evans Street, and Websters Landing. The new Spencer Street Bridge would include bike lanes that would extend east to Salina Street via Catawba, and west to Clinton Street with new bike lanes. These facilities would enhance bicycle connections in the local street network within the Project Area and improve connectivity between neighborhoods, the Downtown business district, and other key destinations.

**Transit**

No changes in bus service are proposed under the Community Grid Alternative. However, potential minor impacts on existing operations are projected due to the proposed modifications of the following freeway and arterial roadways:

- Traffic from northbound Almond Street to eastbound and westbound I-690 would need to use new I-690 Interchange at North Crouse and Irving Avenues
- Provision of missing I-81/I-690 connections
- Existing Pearl Street and Butternut Street on-ramps would be replaced with a single on-ramp at Pearl Street
- Realignment of Butternut Street bridge

- Existing Franklin Street/West Street and Clinton Street/Salina Street off-ramps would be replaced with a single off-ramp at Clinton Street
- I-690 Interchange 11 (West Street) and removal of the West Street Overpass

These roadway modifications under the Community Grid Alternative may require rerouting of buses for portions of their existing bus service routes. This may subsequently affect bus stop locations and possibly schedules. Based on the Centro route guide, potential bus routes affected include:

- Route 22 James Street – Route 298
- Route 45 Destiny USA
- Route 46 Liverpool – Route 57 – Great Northern Mall
- Route 48 Liverpool – Morgan Road – Avon Parkway – Grampian Road
- Route 50 Destiny USA via I-81
- Route 82 Baldwinsville
- Route 84 Mattydale
- Route 86 Henry Clay Boulevard
- Route 88 North Syracuse
- Route 148 Liverpool – Morgan Road
- Route 162 Manlius via I-690 – Widewaters Parkway
- Route 184 Mattydale – Allen Road
- Route 186 Henry Clay Boulevard – Wetzel Road
- Route 188 North Syracuse - Cicero
- Route 246 Oswego – Syracuse via Fulton/Phoenix
- Route 248 Liverpool – Morgan Road
- Route 286 Henry Clay Boulevard – Wetzel Road
- Route 288 North Syracuse – Cicero – Central Square
- Route 362 DeWitt – Widewaters Parkway
- Route 323x James Street – East Syracuse – Minoa Express
- Route 388 Central Square
- Route 550 Destiny USA

Although many bus routes potentially would be affected by the implementation of the Community Grid Alternative, the impacted portions of the existing bus routes would not be long (compared to the entire length of the routes) and, therefore, the expected delays, detours, and bus stop relocations should be minimal.

**Airports, Railroad Stations, and Ports**

No changes are proposed; no conflicts are expected.

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

No changes are proposed to preclude access to any recreation area, and no conflicts are expected.

At Almond Street and Genesee Street, pedestrian access to Forman Park would be improved via the removal of an existing east-bound to west-bound vehicular turn lane for Genesee Street. Forman Park, Wilson Park, the Connective Corridor, and the Erie Canalway Trail will be more accessible for bicycle users with the addition of new bicycle infrastructure on Almond Street.

The Project changes at West Street and Genesee Street will improve access and connectivity for pedestrians and bicyclists to the Onondaga Creekwalk via new sidewalk and shared-use (pedestrian and bicyclist) path segments. The bicycle facility at Lodi Street, Canal Street, and Walnut Street will improve accessibility to Ormand Spencer Park.

## INFRASTRUCTURE

### Proposed Highway Section

Refer to **Appendix A-1** for a typical section.

*Right-of-way*

**Section 6.3.1, Land Acquisition, Displacement, and Relocation** identifies the property needs for each project alternative.

*Curb*

Within the I-81 Viaduct Study Area, the majority of I-81 and I-690 non-bridge sections, including the ramps, would include a mountable curb (Type PT100). The mountable curb would be placed at the outside edge of shoulder to help reduce the amount of untreated storm water by directing runoff to the new closed drainage system. Curbing would not be provided along the reconstructed sections of I-81 in the I-481 South Study Area, I-481 East Study Area, and the I-481 North Study Area where adequate right-of-way exists for open ditches and swales.

Six-inch-high non-mountable curbing would be provided along both sides of city streets within limits of reconstruction, and existing curbing would be preserved in sections programed for mill and inlay treatment. Refer to typical sections in **Appendix A-1** for more specific detail of curbing types and limits.

*Grades*

All segments of I-81 and I-690 within the project limits, and their associated ramps, would meet the maximum grade criteria listed in **Table 5-25.** In addition, the proposed grades for reconstructed local streets also would meet maximum grade criteria, except at two locations. The new eastbound I-690 to northbound former I-81 ramp will exceed design criteria and the existing grade of Van Buren Street will be retained as a non-standard feature. Refer to **Appendix A-1** for profiles of all reconstructed sections of highway and local streets.

*Intersection Geometry and Conditions*

Under the Community Grid Alternative, numerous intersections would be reconstructed to meet geometric standards and traffic operational needs, and to address pedestrian and bicycle accommodation. Some of the more substantial intersection work will include:

- West Street/W. Genesee Street – This grade separated crossing currently has no direct connection between West Street and Genesee Street. The eastbound I-690 exit ramp connects to both West Street and Genesee Street. The West Street overpass would be removed as part of this alternative and replaced with an at-grade signalized intersection. The new intersection would provide for all traffic movements as well as greatly enhance pedestrian and bicycle accommodation.
- Martin Luther King East/former I-81/Renwick Avenue – With removal of the existing I-81 viaduct, a new at grade intersection would be created in the vicinity of the existing intersection of Martin Luther King East and Renwick Avenue. The new intersection would be either signalized or a roundabout. The profile of Martin Luther King East would be modified, but there would be no impact to the existing parking lot driveway on the east side of Dr. King Elementary School. Renwick Avenue would be reconstructed as a southern extension of Almond Street. The new intersection would provide for all traffic movements as well as enhance pedestrian and bicycle accommodation.
- Renwick Avenue/Fineview Place – The section of Fineview Place between Raynor Street and Renwick Avenue would be removed; therefore the Renwick Avenue/Fineview Place intersection would be eliminated.
- Renwick Avenue/Van Buren Street – Renwick Avenue would be reconstructed as a southern extension of Almond Street, and a new signalized intersection would be constructed at Van Buren Street. The new intersection would provide for all traffic movements as well as enhance pedestrian and bicycle accommodation.
- Van Buren Street/Irving Avenue – This signalized intersection would be modified slightly to accommodate separate turn lanes at the intersection. The intersection modifications would primarily involve repaving, restriping, and replacement of the signals and signing. In addition, sidewalk ramps would be reconstructed as needed to meet current standards, and deteriorated sections of curbing and sidewalk would be replaced.
- Almond Street/Catherine Street Corridor, Van Buren Street to Burnet Avenue – All intersections along the Almond Street/Catherine Street corridor would be reconstructed. The intersections would be designed to accommodate traffic operational needs and improve pedestrian and bicycle accommodation. All signals and traffic control systems would be replaced.
- Crouse Avenue, Adams Street to Burnet Avenue – The section of Crouse Avenue between Adams Street and E. Genesee Street would be converted from a one- way to a two-way street. The intersection modifications would primarily involve repaving, restriping, replacement of the signals and signing, replacement of deteriorated sections of curbing and sidewalk, and replacement sidewalk ramps as needed to meet current standards. The remaining section of Crouse Avenue between E. Genesee Street and Burnet Avenue would be reconstructed, including signals, curbing, and sidewalks, to support the traffic operational needs related to the new I-690 interchange ramps as well as to enhance pedestrian and bicycle accommodation.

- Butternut Street, Spencer Street, Court Street, and Bear Street – Due to the widening and reconstruction of the northern section of I-81, the various crossing street bridges would be replaced, and the adjoining intersections on both sides of I-81 would be modified or reconstructed as necessary. All impacted intersections would be modified to meet geometric requirements, accommodate traffic operational needs, and enhance pedestrian and bicycle accommodation.
- Irving Avenue - The section of Irving Avenue between Adams Street and E. Fayette Street would be converted to three travel lanes by primarily repaving, restriping, replacement of the signals, replacement of deteriorated sections of curbing, and sidewalk and replacement sidewalk ramps as needed to meet current standards. In addition, Irving Avenue would be extended to the north, through vacant property, to connect to the new I-690 interchange. The extension would create new intersections at Water Street and Erie Boulevard. The new intersections would be signalized to support the traffic operational needs as well as enhance pedestrian and bicycle accommodation.
- Oswego Boulevard – The existing Oswego Boulevard/Erie Boulevard intersection would be reconstructed to support a new southbound exit ramp from former I-81. In addition, Oswego Boulevard would be extended to the northwest to form a new intersection with E. Willow Street and the existing intersection with James Street would be reconstructed. All three intersections would be signalized to support the traffic operational needs as well as enhance pedestrian and bicycle accommodation.
- Pearl Street - The existing Pearl Street/E. Willow Street intersection would be reconstructed to support a new northbound entrance ramp connecting to former I-81. In addition, Pearl Street would be extended to the southeast to form new intersections with James Street and Erie Boulevard. All three intersections would be signalized to support the traffic operational needs as well as enhance pedestrian and bicycle accommodation.
- Butternut Street, Spencer Street, Court Street, and Bear Street – Due to the widening and reconstruction of the northern section of I-81, the various crossing street bridges would be replaced, and the adjoining intersections on both sides of I-81 would be modified or reconstructed as necessary. All impacted intersections would be modified to meet geometric requirements, accommodate traffic operational needs, and enhance pedestrian and bicycle accommodation.

The full extent of intersection work under the Community Grid Alternative is shown on the plans in **Appendix A-1.**

*Roadside Elements*

- Where appropriate, snow storage areas would be provided adjacent to the curbs on all reconstructed streets.
- A shared-use (bicycle and pedestrian) path would be provided along the west side of the new southern arterial between Martin Luther King East and Van Buren Street, along the west side of Almond Street between Van Buren Street and Erie Boulevard, and along the east side of Almond Street between Adams Street and Erie Boulevard. In addition, a

network of shared-use (bicycle and pedestrian) paths would be constructed in the West Street area to enhance connectivity to the existing Creekwalk.

- With few exceptions, minimum five-foot-wide sidewalks would be constructed along both sides of all reconstructed city streets and all sidewalk ramps would be upgraded to meet current ADA standards.
- Driveways would be modified to comply with City of Syracuse standards and current NYSDOT "Policy and Standards for Design of Entrances to State Highways."
- Clear Zone - The design clear zones shown in **Table 5-75** were established in accordance with the NYSDOT HDM and the AASHTO Roadside Design Guide. Clear zones will be further evaluated when design advances to adjust for slopes, roadway curvature, etc. Where fixed objects and other hazards within the clear zone cannot be removed, roadside appurtenances, such as guide rail, would be considered.

**Special Geometric Design Elements**

*Nonstandard Features*

During the project alternatives development phase, efforts were made to ensure that the design complied with the geometric features and cross sectional elements set forth in **Section 5.4**. In addition, existing roadside design features within the project corridor were analyzed against these criteria to identify existing features that did not meet the current design standards. For any feature that does not meet the criteria, a completed Non-Standard Feature Justification Form is required. For the Community Grid Alternative, a total of eleven non-standard geometric features and one non-standard operational feature are recommended to be retained. The geometric features include three non-standard features on the interstate mainline segments of the Project, five interstate ramp locations and three non-standard features on local streets within the Project Area. In addition, there is projected to be a section of the northern segment of former I-81 that will exhibit non-standard Level of Service (LOS) during the PM peak hour in the design year of 2050. See **Table 5-76** for summary of the geometric and operational Non-Standard Features recommended to be retained and refer to **Appendix A-3** for a copy of the non-standard Feature Justification forms for each of these design elements. In addition, there are ten non-standard Control of Access locations that are recommended to be retained. See **Table 5-57** for a listing of the Control of Access locations and refer to **Appendix A-3** for a copy of the Non-Standard Feature Justification forms for each of these locations.

*Non-Conforming Features*

In addition to the critical design elements depicted in Chapter 2 of the NYSDOT HDM, many other design features were taken into consideration during the development of this alternative following normally accepted engineering policies. Due to the confined right-of-way, location of some buildings, and limited distance between adjacent intersections, some design elements were adjusted to meet the Project's purpose and need while minimizing undesirable impacts to the local community. Refer to **Table 5-77** for a listing of non-conforming design elements, followed by an explanation justifying the retention of each non-conforming feature.

**Table 5-75**
**Roadside Elements – Clear Zone**

| Route Name | Design Speed | Clear Zone[1] |
|---|---|---|
| New I-81 (former I-481), between existing I-481 south interchange and existing I-481 north interchange. | 70 mph | 30 ft. |
| Former I-81, between existing I-481 south interchange and MLK. Jr., East. | 60 mph | 30 ft. |
| Former I-81, between I-690 and Hiawatha Boulevard. | 60 mph | 30 ft. |
| I-690, Leavenworth Avenue to Beech Street | | |
| Ramps (45-50) | 45-50 mph | 26 ft. |
| Ramps (40) | 40 mph | 17 ft. |
| City Streets | 35 mph | Note 2 |

Notes:

1. Clear zone values taken from Table 10-1 from the NYSDOT Highway Design Manual are un-adjusted. When design advances, adjusted clear zone will be determined from adjustments made from minimum curvature and Table 10-2 from the NYSDOT Highway Design Manual.
2. Suggested clear zone is 1.5 ft. and 3.0 ft. at intersections.

**Table 5-76**
**Non-Standard Features Recommended to be Retained – Community Grid Alternative**

| Location | Design Element (1) | Design Criteria (2) | Proposed Design Standard (3) |
|---|---|---|---|
| Northbound I-81 (at south interchange) | HSSD | 730 ft. | 679 ft. left lane<br>524 ft. right lane |
| Southbound I-81 (at south interchange) | HSSD | 730 ft. | 542 ft. left lane<br>703 ft. right lane |
| Southbound I-81 (at north interchange) | HSSD | 730 ft. | 542 ft. left lane<br>703 ft. right lane |
| Interstate Ramp – Eastbound I-690 to Northbound former I-81. | Grade | -6.0% max | -6.42% |
| Interstate Ramp – Eastbound I-690 to Northbound former I-81. | HSD | 305 ft. | 270 ft. |
| Interstate Ramp – Eastbound I-690 to off-ramp to Irving Avenue. | Curve | 231 ft. | 150 ft. |
| Interstate Ramp – Eastbound I-690 to off-ramp to Irving Avenue. | HSSD | 200 ft. | 135 ft. |
| Interstate Ramp – Westbound I-690 on-ramp from Irving Avenue. | Curve | 231 ft. | 158 ft. |
| Van Buren Street, Almond Street to Henry Street | HSD | 250 ft. | 76 ft. |
| Van Buren Street, Almond Street to Henry Street | Grade | 8% max. | 15.52% |
| Butternut Street, at State Street Intersection | HSD | 200 ft. | 132 ft. |
| Northbound Former I-81, weave section south of I-481 north interchange. | LOS | LOS=D | LOS=C (2020)<br>LOS=F (2050) |

**Notes:**

1. HSSD = Horizontal Stopping Sight Distance, HSD= Headlight Sight Distance, LOS= Level of Service
2. Refer to Design Criteria Tables in Section 5.3.
3. Refer to **Appendix A-3** for Non-Standard Feature Justification Forms

**Table 5-77**
**Non-Conforming Features Recommended to be Retained [(1)] – CG Alternative**

| Location | Design Element | Recommended Design Standard [(2)] | Proposed Design Standard | Justification |
|---|---|---|---|---|
| SB I-81, STA 144+77 to 151+34 | Broken Back Curve | 1500 ft. | 1,204 ft. | 1 |
| SB I-81, STA 144+85 to 151+41 | Broken Back Curve | 1500 ft. | 657 ft. | 2 |
| NB I-81, STA 69+84 to STA 74+17 | Broken Back Curve | 1500 ft. | 1,220 ft. | 3 |
| NB I-81, STA 71+57 to STA 75+27 | Broken Back Curve | 1500 ft. | 656 ft. | 4 |
| Ramp - WB I-690 to West St., STA 14+91 TO STA 18+53 | Broken Back Curve | 1500 ft. | 312 ft. | 5 |
| Ramp – SB I-81 to WB I-690, STA 102+98 TO STA 105+40 | Compound Curve Ratio | 1:2 Ratio | 1:2.7 Ratio | 6 |
| Ramp – SB I-81 to WB/EB I-690 split, STA 3+75 | Ramp Spacing | 800 ft. | 493 ft. | 7 |
| SB I-81, Bear St. on-ramp to Spencer St. off-ramp. | Ramp Spacing | 1600 ft. | 1000 ft. | 8 |
| SB I-81, WB/EB I-690 off-ramp to Clinton St. off-ramp. | Ramp Spacing | 1000 ft. | 460 ft. | 9 |
| NB I-81, WB I-690 on-ramp to EB I-690 on-ramp. | Ramp Spacing | 1000 ft. | 960 ft. | 10 |
| NB I-81, EB I-690 on-ramp to Court St. off-ramp. | Ramp Spacing | 2000 ft. | 1,830 ft. | 11 |
| NB I-81, Court St. on-ramp to Hiawatha Blvd. off-ramp. | Ramp Spacing | 1600 ft. | 1,544 ft. | 12 |
| WB I-690, Irving Ave. on-ramp to former NB I-81 off-ramp. | Ramp Spacing | 2000 ft. | 1,584 ft. | 13 |
| WB I-690, former NB I-81 off-ramp to West St. off-ramp. | Ramp Spacing | 1000 ft. | 874 ft. | 14 |
| WB I-690, West St. on-ramp to Geddes St. off-ramp. | Ramp Spacing | 1600 ft. | 1385 ft. | 15 |
| EB I-690, Geddes St. on-ramp to West St. off-ramp. | Ramp Spacing | 1600 ft. | 1,550 ft. | 16 |
| EB I-690, West St. off-ramp to former NB I-81 off-ramp. | Ramp Spacing | 1000 ft. | 493 ft. | 17 |
| EB I-690, former SB I-81 on-ramp to Irving Ave. off-ramp | Ramp Spacing | 2000 ft. | 1,671 ft. | 18 |

**Notes:**
1. When design advances, further refinements would attempt to further improve this feature.
2. Refer to Design Criteria Tables in Section 5.3.

*Justification for retaining Non-Conforming Feature:*

1. This broken back curve is necessary to maintain I-81 within the existing Right-of-Way (ROW). This spacing reflects 80 percent of the recommended spacing.

2. This broken back curve is in an area bounded by Destiny USA and Lodi Street. To avoid ROW impacts on either side, a short tangent section was necessary. This is an existing broken back curve that is being maintained.
3. This broken back curve is necessary to maintain I-81 within the existing ROW. This spacing reflects 81 percent of the recommended spacing.
4. This broken back curve is in an area bounded by Destiny USA and Lodi Street. To avoid ROW impacts on either side, a short tangent section was necessary. This is an existing broken back curve that is being maintained.
5. This broken back curve was necessary to reduce impacts to historic property directly to the north.
6. This broken back curve is located in an area where the exit ramp from southbound I-81 begins to split to proceed to either westbound or eastbound I-690. This resulted from a combination of balancing ramp spacing criteria, the geometry of both movements on the ramp and the need to reduce ROW impacts.
7. Increasing the ramp spacing to the recommended distance would have resulted in either additional ROW impacts or an undesirable broken back curve.
8. This weaving segment is an existing condition that would be improved as a result of adding a fourth mainline travel lane and an additional auxiliary lane for the weaving maneuvers. Maintaining this weaving condition with improvements would prevent the closure of Genant Drive from Bear Street to Spencer Street and the relocation of driveway access to Clinton Street. This would also prevent the rerouting of traffic onto North Clinton Street which would result in addition ROW impacts.
9. This spacing is an existing condition created by the two consecutive exits to North Franklin Street and North Clinton Street. Under this alternative, the North Franklin Street off-ramp would be removed. The new southbound I-81 to westbound/eastbound I-690 ramp would be placed in about the same location. The non-conforming ramp spacing would remain. Properly spaced overhead signing would be provided and would provide clear directions to motorists which lane they should be in for their intended exit.
10. Increasing this ramp spacing would require reducing the weaving distance between the eastbound I-690 on-ramp and the Court Street off-ramp.
11. This weaving segment is created by the inclusion of the missing connector from eastbound I-690 to northbound I-81. The proposed spacing reflects 92 percent of the recommended spacing. To achieve acceptable operations at this weaving segment, an additional exit lane was added to the Court St. off-ramp to reduce the amount of weaving maneuvers. Increasing this ramp spacing would require relocating the Court Street off-ramp therefore increasing ROW impacts.
12. This weaving segment is an existing condition that would be improved as a result of adding a fourth mainline travel lane. It is worth noting that the proposed spacing reflects 96 percent of the criteria.
13. Increasing this ramp spacing would require eliminating the ramp from Irving Avenue and maintaining the North Crouse Avenue ramp. This would overburden North Crouse

Avenue with traffic requiring mitigation in the form of widening resulting in increased ROW impacts.

14. Increasing this ramp spacing would require a non-standard grade on the westbound I-690 off-ramp or reducing the weaving distance for the ramp spacing under number 13 above
15. This existing weaving segment would remain but improved as vehicles on westbound I-690 would only need to move over one lane to use the North Geddes Street exit ramp. The existing configurations forces drivers to mover over two lanes to exit therefore increasing potential conflicts. Increasing the spacing between these ramps would require moving one of the two ramps, thus increasing ROW impacts.
16. This ramp spacing was necessary to reduce impacts to Belden Avenue. The proposed spacing reflects 97 percent of the recommended spacing.
17. This spacing is a result of the new eastbound I-690 off-ramp to northbound I-81. Increasing this spacing would result in moving the off-ramp to northbound I—81 to the east. This would produce ROW impacts in the vicinity of Salt Street due to the required curvature of the ramp. Properly spaced overhead signing would be provided and would provide clear directions to motorists as to which lane they should be in for their intended exit.
18. Increasing this weaving segment would require moving the Irving Avenue off-ramp to North Crouse Avenue. This would overburden North Crouse Avenue with traffic requiring mitigation in the form of widening, resulting in increased ROW impacts.

**Pavement and Shoulder**

Due to a number of factors, including profile changes, horizontal alignment changes, and construction phasing implications, it was determined that pavement rehabilitation for I-81 and I-690, within the I-81 Viaduct Study Area would not be considered and the pavement would be reconstructed. In addition, the Project also includes a variety of work on city streets. Due to the nature of the work, the anticipated amount of utility relocation work, and the anticipated disturbance from highway and bridge reconstruction, it is assumed that city streets that will be widened or re-aligned would be reconstructed, and that city streets proposed for traffic signal replacement and pavement re-striping would be milled and inlayed. In accordance with the NYSDOT Comprehensive Pavement Design Manual, a Pavement Evaluation and Treatment Selection Report (PETSR) has been prepared. The report provides recommendations regarding pavement type and pavement thickness design for new and reconstructed interstates, ramps, state routes, and local roads for the I-81 Viaduct Project. A life cycle cost analysis of both rigid and flexible pavement alternatives was developed. Refer to **Appendix A-4** for a copy of the PETSR.

**Drainage Systems**

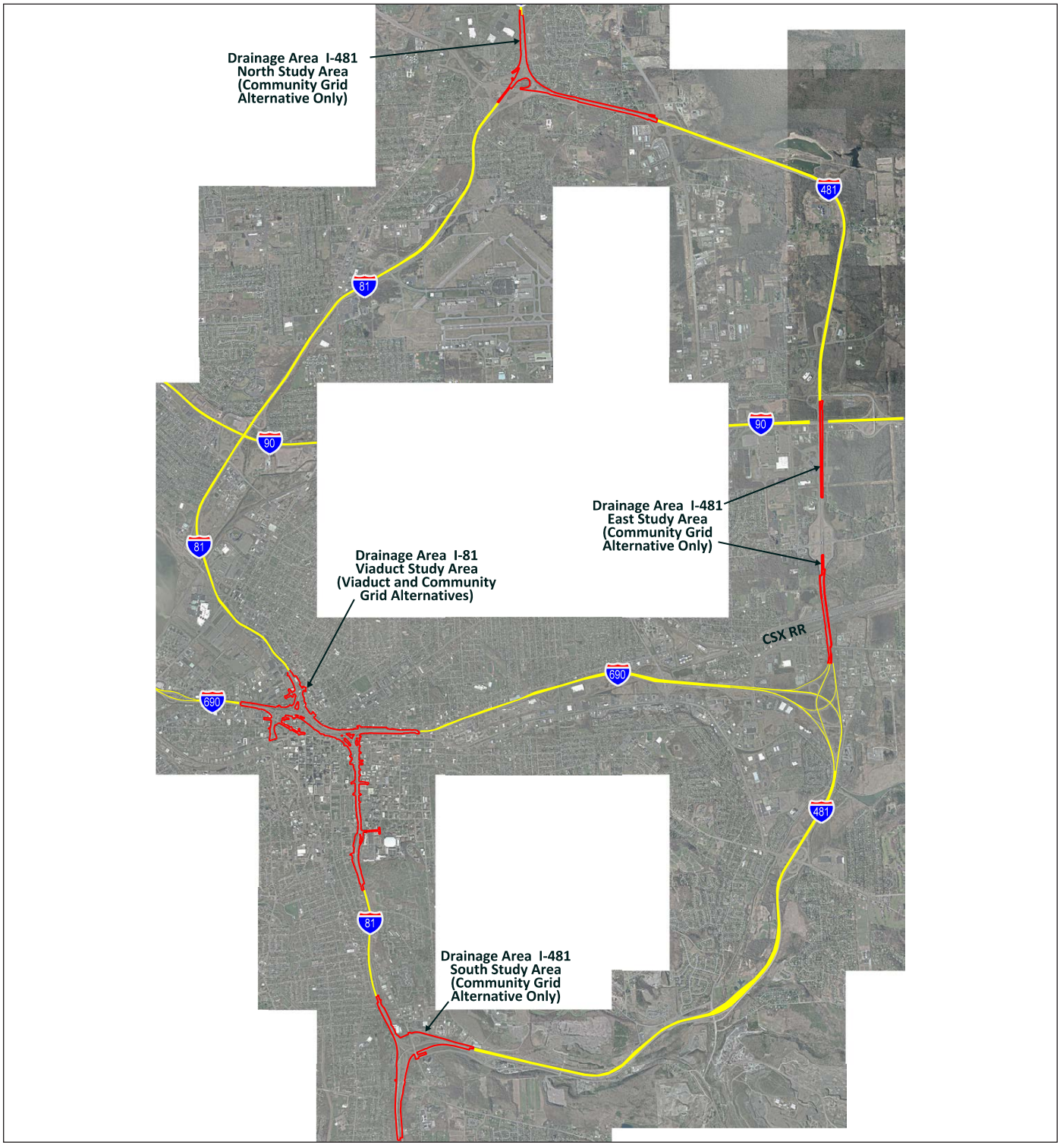
The storm sewer systems that serve the I-81 and I-690 highway segments within the Project Area are tributary to Onondaga County and City of Syracuse combined sewers, and are subject to the requirements of the New York Department of Environmental Conservation's (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for

Stormwater Discharges from Construction Activity (GP-0-15-002). A Stormwater Pollution Prevention Plan (SWPPP) with the appropriate stormwater management and sediment and erosion control measures will be developed for the Project. Stormwater quality treatment will be required for this Project and the County and City both require a reduction in the amount of stormwater runoff volume that will be discharged into their systems.

An analysis of the existing and proposed highway stormwater runoff was undertaken for the Community Grid Alternative, including the changes needed along the I-481 corridor (see **Figure 5-18**). The I-81 Viaduct Study Area portion of the project area is located within a dense urban area where most of the surfaces are impervious. Surface runoff drains first to catch basins which are connected to the City of Syracuse combined sanitary and storm sewer system, which in turn discharges into the county combined sewer system. The existing combined sewer system is vulnerable to combined sewer overflows during frequent rain events and the entire Project Area is under substantial restrictions to control water quality and water quantity.

Within the I-481 South, East and North Study Areas, stormwater is handled through a system of open ditches and culverts which discharge to open water courses and waterbodies within their respective study area. Within the I-81 Viaduct Study Area, stormwater flows to a number of connection points, which lead to the County/City combined sewer system. A comparison between the existing impervious areas and the proposed impervious areas shows that there is less than a two percent increase in impervious area for the Community Grid Alternative (refer to **Table 5-78**). This assumes that the areas within the existing viaduct area at ground level will be re-developed using impervious land uses such as asphalt parking and sidewalks. Should this area be re-developed using pervious land uses such as basins, landscaping, or parking lots with pervious pavements, there could be up to a 5% reduction in impervious area and resulting runoff, not including any additional reductions that may result from required water quality treatment areas or channel protection.

Since peak flow and the total volume of runoff is directly attributable to the total amount of impervious area, the peak flow could be reduced with techniques such as removal of parking areas used on I-81 or I-690 right-of-way, through the use of pervious pavements for replacement parking lots and road shoulders or with at grade detention or retention basins. Pervious pavements store water in the voids of the pavement or in the aggregate sub-base below the pavement and slowly discharge to groundwater. Depending on the infiltration capacity of the underlying native material, the pervious pavement and aggregate base material would be an underground infiltration basin and reduce the runoff rate from these areas to zero. Appropriate application could result in the built condition matching the existing condition runoff rate, resulting in no overall increases to the existing combined sewer systems. While, the NYSDEC may allow elimination of the water quantity reduction requirements for redevelopment projects having only minor increases in impervious area, because the City and County are under a court injunction to reduce flows to the combined sewer system, it is unlikely that water quantity reductions requirements would be relieved for this project if continued connections to the combined sewer system is maintained.




Community Grid Alignment
Drainage Study Boundary

**I-81 Viaduct Project**

**Figure 5-18**

**Table 5-78**
**Drainage Area and Peak Flow Comparison – Community Grid Alternative**

| | Total Existing Drainage Area (1) | Open Areas Redeveloped as Impervious Area (2) | Open Areas Redeveloped as Pervious Area (3) |
|---|---|---|---|
| Total Area | 502.2 acres | 502.2 acres | 502.2 acres |
| Pervious Area | 179.0 acres | 172.7 acres | 194.0 acres |
| Impervious Area | 323.2 acres | 329.4 acres | 308.1 acres |
| Impervious Area Change | 0 | 1.9 % | -4.7 % |
| Project Runoff | | | |
| 1-year (4.34 inches/hr.) | 682.6 cfs | 691.5 cfs | 669.7 cfs |
| 10-year (4.13 inches/hr.) | 1,515.6 cfs | 1,535.4 cfs | 1,486.9 cfs |
| 100-year (4.34 inches/hr.) | 1923.0 cfs | 1,948.1 cfs | 1,886.5 cfs |

**Notes:**

1. Total Area includes required improvements along the I-481 corridor.

Impervious Development assumes that the areas within the I-81 Viaduct Study Area that are opened up as a result of highway and viaduct modifications are redeveloped as impervious land uses similar to the existing uses.

Pervious Development assumes that the areas within the I-81 Viaduct Study Area that are opened up as a result of highway and viaduct modifications are redeveloped as pervious land uses such as basins, pervious pavements, and landscaped areas.

Rainfall intensity based on NOAA 14 Point Precipitation Frequency for the I-81/I-690 interchange for the 15 minute Time of Concentration.

CFS = Cubic Feet per Second.

The existing I-81 drainage system connects to the combined sewer system using small diameter pipes that likely do not meet the current design standards. A new storm drain outfall to a large capacity system would be required to achieve current design standards for storm drain design of the freeway system. This new outfall would be common to all alternatives considered, except the no-built alternative. This new outfall would have to show that there are no adverse effects to the downstream watercourses.

Because of the small increase in impervious area, Water Quantity controls may be waived as design advances and a downstream analysis is provided that shows no adverse impacts. Two basic concepts could be utilized to reduce the amount of stormwater runoff discharging into the existing combined sewer system and meet the water quantity reduction requirements continued use of the existing combined sewer system in combination with on-site storage or detention, or construction of a new storm drain outfall to a water-body that has a large capacity.

Continued use of the existing combined sewer system would require implementation of water quantity reduction measures, the most likely of which would include permeable pavement and stormwater retention basins within the Project Area. **Table 5-79** shows the anticipated water quantity volume that would be required to be retained on site for the Community Grid Alternative. This water would be required to be stored in retention basins at the ground level or below ground levels. The amount of surface area that may be required could substantially reduce future re-development options.

Alternatively, with the large amount of construction that is required, supplemental drainage capacity could be added to the primary project corridor that could intercept a substantial amount of the Project Area drainage, thereby reducing the amount of stormwater discharging into the combined sewer system. This option would include constructing a new storm sewer trunk line within the project right-of-way, from the southern limit of the I-81 Viaduct Study Area, along the Almond Street corridor, then westward along the I-690 corridor, to a new outlet at Onondaga Creek. This new storm trunk sewer would provide a positive drainage outlet substantially reducing the load on the existing combined storm drain

**Table 5-79**
**Water Quantity Reduction Volume-Community Grid Alternative**

| Area | Total Impervious Area [(1)] (Acres) | Total Disturbed Area (Acres) | Water Quality Volume[(2)] (acre-ft) |
|---|---|---|---|
| I-81 Corridor, Colvin St. to MLK. Jr., East | 4.94 | 8.95 | 0.824 |
| I-81 Corridor, MLK. Jr., East to Burt St. | 2.82 | 9.92 | 0.511 |
| I-81 Corridor, Burt St. to Adams St. | 3.41 | 7.66 | 0.581 |
| I-81 Corridor, Adams St. to E. Genesee St. | 6.43 | 7.63 | 1.038 |
| I-81 Corridor, E. Genesee St. to Erie Blvd. | 3.67 | 8.47 | 0.627 |
| I-81 Corridor, Davidson St. to Salina St. | 11.04 | 14.00 | 1.790 |
| I-690 Corridor, Leavenworth Ave. to Salina St. | 15.03 | 19.45 | 2.441 |
| I-690 Corridor, Salina St. to Townsend St. | 16.61 | 20.17 | 2.686 |
| I-690 Corridor, Townsend St. to Forman Ave. | 8.70 | 12.06 | 1.420 |
| I-690 Corridor, Forman Ave. to Crouse Ave. | 6.27 | 6.58 | 1.005 |
| I-690 Corridor, Crouse Ave. to Lodi St. | 6.35 | 9.10 | 1.039 |
| I-481 South Study Area | 2.40 | 102.00 | 0.649 |
| I-481 East Study Area | 3.20 | 32.70 | 0.760 |
| I-481 North Study Area | 7.60 | 66.00 | 1.555 |
| Total | 98.47 | 324.69 | 16.926 |

**Notes:**
1. Includes new development impervious area plus redevelopment impervious area within the project area of the Community Grid Alternative and does not include areas in the comparative Total Area that are not physically impacted by this Alternative.
2. NYSDEC formulas which includes Total Impervious, and Total disturbed areas as variables.

system. Isolated connections to the existing combined sewer system may be utilized in some isolated areas that are not able to be connected to the new storms drain system due to elevation or to avoid substantial utility relocations. The Conceptual Storm Sewer Trunk Line would be designed based on a 50-year design storm frequency and would begin as a 72-inch diameter pipe at the south end of the I-81 Viaduct Study Area (south of Martin Luther King East) and increase in diameter to a 96-inch diameter pipe before out letting to Onondaga Creek. A conceptual plan and profile are shown in **Appendix A-1**. The exact location of the storm sewer trunk line will be developed when design advances. A new storm sewer trunk line would meet the local requirement of providing for an overall decrease in total stormwater volume contributing to the combined sewers, which in turn will help reduce the number of combined sewer overflows that currently occur in the existing system as well as reduce the amount of stormwater contributing to the county sanitary sewer treatment facility.

In addition to addressing the volume of runoff, water quality treatment will also be required, based on the total amount of impervious area. Water quality treatment for the new bridges and roadway pavements would be accommodated in basins, pervious pavements, or infiltration basins as space permits. Due to the urban nature of the Project Area and the limited space available for traditional treatment systems, more compact treatment devices may be evaluated to meet NYSDEC requirements to remove the pollutants expected from the pavement runoff. These devices would be proprietary hydrodynamic treatment systems that several manufacturers offer. While some of these devices have excellent removal properties, intense maintenance effort and cost will be a factor in selection of the required treatment system. Evaluation of these devices will be conducted when design advances, as well as when detailed coordination with NYSDEC will occur and the appropriate water quality treatment systems needed for each drainage area will be selected. Additionally, as a result of installing a new trunk line storm sewer as part of this alternative, the demand on the existing combined sewer system will be reduced, which will result in a reduction in the number and magnitude of combined storm water overflows within the existing watershed. The new trunk storm sewer, in combination with peak flow mitigation for any increases in impervious area and water quality treatment for new paved surfaces, will result in improvements to downstream receiving waters.

The Community Grid alternative requires widening and modifications along the I-481 corridor at three locations. These areas are more rural in character and space along each of these areas is available with the exception of where I-481 crosses the CSX railyard and adjacent wetland. The wetland area will be avoided to avoid further wetland mitigation. Water quality treatments in this area will use vegetated filter strips or swales adjacent to the roadway embankment toes or incorporated within the embankment. These systems are conducive to the linear nature to the roadway embankments.

### Geotechnical

Study of the overall existing soil borings data and record plans indicated that the underlying soils at the Project Area are generally consist of silt and clay with bedrock or shale. The depth of bedrock varies along the project alignment from approximately 20 feet to 70 feet below ground. As such, the placement of a new structure in the area would require the use

of pile foundations to provide stability and minimize settlement of the poor soil. Piles for the new bridge would bear on bedrock where appropriate. In addition, under the Community Grid Alternative, there are two known sinkholes within the I-481 South Study Area. Reconstruction of the southern interchange would require special geotechnical consideration when design advances to mitigate the sinkholes before the proposed roadway and bridges construction in the area. Geotechnical surveys would be performed to identify the extent of existing or potential sinkholes. There are several sinkhole solutions available depending on subsurface conditions and site restrictions. The mitigation techniques include but are not limited to compaction to pre-collapse sinkholes, densify and reinforce loose overburden soils, dynamic compaction to densify underlying soils and collapse voids, and compaction grout. Also, deep piles foundation are typically the most effective long-term sinkhole remediation technique because sinkholes, by their nature, are unpredictable. Following the sinkholes mitigation, post-mitigation monitoring would be implemented to ensure no sinkholes resurface at or near the site of mitigated sinkholes.

**Structures**

Approximately 53 existing bridges would be replaced with approximately 48 new bridges, having a total deck area of about 892,000 square feet. In addition, 11 existing bridges would be rehabilitated, and one bridge would be removed as part of the Community Grid Alternative (see **Table 5-80**). All new bridges would conform to current standards and would incorporate aesthetic treatments where appropriate. Within the I-481 South Study Area, the I-481 East Study Area, and the I-481 North Study Area, there would be a combination of bridge replacements and bridge rehabilitations. The bridges that would be rehabilitated (see **Table 5-81**) would address structural and geometric deficiencies and restore long-term service life expectancy. Refer to Preliminary Structure Plans in **Appendix A-1** for a listing of new bridges as well as more detailed information for the proposed replacement bridges.

Under the Community Grid Alternative, auxiliary lanes would be added to the existing bridges required by the new alignment. In order to accommodate the wider lanes, these bridges would require new bridge deck and girders to be installed, upgrade to the bearings, as well as localized repair at the superstructure and substructure components as necessary. The objectives of the rehabilitation work are to increase the loading capacity and to meet current design standards for the future traffic demands.

**Table 5-80**
**Existing Bridges Impacted by Community Grid Alternative**

| BIN | Location | Project |
|---|---|---|
| 1031570 | BUTTERNUT STREET OVER I-81 | Replaced |
| 103156D | SB I-81 RAMP OVER GENESEE STREET | Replaced |
| 103156C | NB I-81 RAMP OVER GENESEE STREET | Replaced |
| 103156A | SB I-81 RAMP OVER JACKSON STREET | Replaced |
| 103156B | NB I-81 RAMP OVER JACKSON STREET | Replaced |
| 1031559 | I-81 OVER CASTLE STREET | Replaced |
| 1031569 | I-81 VIADUCT FROM FAYETTE STREET TO VAN BUREN STREET | Replaced |

**Table 5-80**
**Existing Bridges Impacted by Community Grid Alternative**

| BIN | Location | Project |
|---|---|---|
| 1050779 | I-690 OVER LEAVENWORTH AVE | Replaced |
| 1051091 | EB I-690 OVER N CROUSE AVE | Replaced |
| 1051092 | WB I-690 OVER N CROUSE AVE | Replaced |
| 1051119 | I-690 OVER LODI STREET | Replaced |
| 1050001 | SB N WEST STREET OVER HIGHWAY 5 | Replaced |
| 1050002 | NB N WEST STREET OVER HIGHWAY 5 | Replaced |
| 1050780 | N WEST STREET RAMP TO WB I-690 OVER I-690 | Replaced |
| 1050790 | WB I-690 RAMP TO N WEST STREET OVER I-690 | Replaced |
| 1050800 | BUTTERNUT STREET TO SB N WEST STREET OVER ONONDAGA CREEK | Replaced |
| 105080A | WB I-690 RAMP TO SB N WEST STREET OVER ONONDAGA CREEK | Replaced |
| 1050821 | WB I-690 OVER ONONDAGA CREEK | Replaced |
| 1050822 | EB I-690 OVER ONONDAGA CREEK | Replaced |
| 1050840 | NB N WEST STREET RAMP TO EB I-690 OVER ONONDAGA CREEK | Replaced |
| 1050010 | NB N WEST STREET RAMP TO HERALD PLACE OVER ONONDAGA CREEK | Replaced |
| 1050851 | WB I-690 OVER N FRANKLIN STREET | Replaced |
| 1050852 | EB I-690 OVER N FRANKLIN STREET | Replaced |
| 1054020 | WB I-690 OVER N CLINTON STREET | Replaced |
| 1008489 | I-81 OVER N SALINA STREET | Replaced |
| 1050910 | WB I-690 OVER N SALINA STREET | Replaced |
| 1095510 | WB I-690 OVER I-81 | Replaced |
| 1050921 | WB I-690 OVER E WILLOW STREET | Replaced |
| 1050922 | WB I-690 RAMP TO NB I-81 OVER E WILLOW STREET | Replaced |
| 105388A | SB I-81 RAMP TO EB I-690 OVER E WILLOW AND JAMES | Replaced |
| 1053882 | NB I-81 OVER E WILLOW, JAMES, AND N STATE | Replaced |
| 1051000 | I-690 OVER N CLINTON, N SALINA, E WILLOW, JAMES, AND N STATE | Replaced |
| 1050950 | WB I-690 OVER JAMES AND N STATE | Replaced |
| 1053881 | SB I-81 OVER E WILLOW, JAMES, AND N STATE | Replaced |
| 105095A | NB I-81 RAMP TO WB I-690 OVER N STATE STREET | Replaced |
| 105100A | EB I-690 RAMP TO SB I-81 OVER N TOWNSEND STREET | Replaced |
| 1051030 | WB I-690 OVER N TOWNSEND STREET | Replaced |
| 1053870 | NB I-81 OVER N TOWNSEND STREET | Replaced |
| 1051050 | WB I-690 OVER N MCBRIDE STREET | Replaced |
| 1051061 | WB I-690 OVER N CATHERINE STREET | Replaced |
| 1053860 | SB I-81 FROM HIGHWAY 5 OVER N TOWNSEND STREET | Replaced |
| 1064590 | WB I-690 RAMP TO SB I-81 OVER E FAYETTE, E WASHINGTON, E WATER, HIGHWAY 5, AND ALMOND | Replaced |
| 1051062 | EB I-690 OVER CATHERINE STREET | Replaced |

**Table 5-80**
**Existing Bridges Impacted by Community Grid Alternative**

| BIN | Location | Project |
|---|---|---|
| 1051063 | EB I-690 RAMP OVER CATHERINE STREET | Replaced |
| 105384A | NB I-81 RAMP TO EB I-690 OVER HIGHWAY 5 | Replaced |
| 1053840 | NB I-81 RAMP OVER HIGHWAY 5 | Replaced |
| 1031580 | SPENCER STREET OVER I-81 | Replaced |
| 1031590 | COURT STREET OVER I-81 | Replaced |
| 1031600 | BEAR STREET (ROUTE 298) OVER I-81 | Replaced |
| 1069110 | E BRIGHTON AVENUE OVER I-81 & EB I-481 INTERCHANGE | Replaced |
| 1069090 | SB I-481 TO SB I-81 RAMP | Replaced |
| 1069100 | SB I-81 TO NB I-481 RAMP | Replaced |
| …….. | NYS&W RAILWAY OVER RENWICK AVENUE | Replaced |
| …….. | FINEVIEW PLACE OVER RENWICK AVENUE | Removed |
| 1072791 | SB I-481 OVER THOMPSON RD | Widen & Rehabilitate |
| 1072792 | NB I-481 OVER THOMPSON RD | Widen & Rehabilitate |
| 1072781 | SB I-481 OVER TOTMAN RD | Widen & Rehabilitate |
| 1093682 | NB I-481 OVER I-90 | Widen & Rehabilitate |
| 1093672 | NB I-481 OVER KIRKVILLE RD | Widen & Rehabilitate |
| 1093571 | SB I-481 OVER CSX TRANS/AMTRAK | Widen & Rehabilitate |
| 1093572 | NB I-481 OVER CSX TRANS/AMTRAK | Widen & Rehabilitate |
| 1093561 | SB I-481 OVER MANLIUS CENTER RD | Widen & Rehabilitate |
| 1093562 | NB I-481 OVER MANLIUS CENTER RD | Widen & Rehabilitate |
| 1031502 | NB I-81 OVER EAST SENECA TURNPIKE | Widen & Rehabilitate |
| 1031639 | SB I-81 RAMP OVER CARAUSEL CENTER DRIVE, LEY CREEK, CSX TRANSPORTATION, AMTRAK | Widen & Rehabilitate |

**Table 5-81**
**List of Rehabilitation Bridges**

| BIN No. | Locations |
|---|---|
| 1072791 | I-481 SB OVER THOMPSON RD |
| 1072792 | I-481 NB OVER THOMPSON RD |
| 1072781 | I-481 SB OVER TOTMAN RD |
| 1093682 | I-481 NB OVER I-90 |
| 1093672 | I-481 NB OVER KIRKVILLE RD |
| 1093571 | I-481 SB OVER CSX TRANS/AMTRAK |
| 1093572 | I-481 NB OVER CSX TRANS/AMTRAK |
| 1093561 | I-481 SB OVER MANLIUS CENTER RD |
| 1093562 | I-481 NB OVER MANLIUS CENTER RD |
| 1031502 | I-81 NB OVER EAST SENECA TURNPIKE |
| 1031639 | I-81 TO RT 370 RAMP OVER CARAUSEL CENTER DRIVE, LEY CREEK, CSX TRANSPORTATION/AMTRAK |

### Hydraulics of Bridges and Culverts

As previously noted, only the replacement bridges over Onondaga Creek would need a hydraulic analysis and there are no know hydraulic issues associated with the existing retaining walls and existing bridge piers. As part of this alternative, the existing retaining walls and piers would be retained or reconstructed as necessary and any replacement piers and retaining walls would be placed further back from the creek than the existing piers and retaining walls. As a result, no adverse effects on hydraulics are anticipated, as the existing conditions would be either maintained or improved. In addition, due to the topography of the area and the elevation of the bridges over the creek, it is anticipated that the freeboard provided below all structures at the 100-year flood will be much greater than the 2-ft minimum required; therefore, a hydraulic study will not be required until when design advances. A Coast Guard Checklist is not required.

### Guide Railing, Median Barriers and Impact Attenuators

All guiderail within the project limits including bridge railing will be evaluated when design advances for conformance to design standards and replaced or repaired, if necessary.

### Utilities

Due to the urban nature and size of the Project Area, there are an extensive number and network of utilities, both private and public, above ground and below ground. A summary of the utilities, the utility owners and the potential conflicts associated with the Community Grid Alternative is included in **Table 5-82.** For the purposes of this report, major utilities are defined as: all underground electric, fiber optic, or steam facilities (not including services), overhead fiber optic, underground gas lines (8 inches diameter or larger), water mains 16 inches in diameter or larger, and sanitary sewer and storm sewer trunk lines 24 inches in diameter or larger. Utilities of unknown size are also included. Because the depth of many underground utilities is not known, and because the depth of impacts from

proposed construction is uncertain, impacts are assumed for any major underground utility in a reconstruction area.

There will be many more impacts to non-major utilities within the project area that are not included in this table, including such things as hydrants, valves, and services. The impacts to those items will need to be addressed as design advances.

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| **I-81: Southern Project Limits to E. Washington Street - Utility Impacts** | | | | | |
| OCWEP | Sanitary Sewer 24" to 72" | Under Renwick Avenue | 295 | I | Yes |
| | | 24" line crossing under I-81 at the center of E. Castle St. from the west project limit of E. Castle St. to approx. 100' east of I-81, continuing south on west side of the NYSW RR tracks to a manhole approx. 50' east of I-81 | 1275 | I | Yes |
| | | 36" line crossing east-west through project limits at E. Raynor Ave | 455 | I | Yes |
| | | East side of Almond Street from E. Taylor Street to Dyer Court, and from Monroe Street to Cedar Street | 1940 | I | Yes |
| | | 48" to 66" line on South side of Harrison St., crossing I-81 and Almond St. from west to east project limit | 3150 | I | Yes |
| | | Center of Harrison Street from Townsend Street to west project limits | 1815 | I | Yes |
| | | 24" line center of E. Genesee St. EB from Almond St. to east project limit | 690 | I | Yes |
| | | South side of Harrison Street, crossing Almond Street from west to east project limits | 3150 | I | Yes |
| | | Center of Madison Street from Almond Street to east project limits | 130 | I | Yes |
| | | Crossing Cedar Street approximately 25 feet east of Almond Street | 90 | I | Yes |
| | | Multiple locations along E. Genesee Street at Almond Street | 1200 | I | Yes |
| OCWEP | Sanitary Sewer Force Main 4" to 14" | South side of Van Buren Street from Almond Street to Stadium Place, with branch crossing Van Buren Street near Henry Street | 1355 | I | Yes |
| OCWEP | Storm Sewer 24" to 36"x60" | East side of Almond Street from Dyer Court to Monroe Street, then crossing west across Almond Street | 575 | I | Yes |
| | | 36"x60" line at center of E. Fayette Street within project limits | 640 | I | Yes |
| | | East side of Almond Street from Cedar Street to E. Genesee Street | 440 | I | Yes |
| | | Center of E. Fayette Street within project limits | 640 | I | Yes |
| | | Center of E. Washington Street east of Almond | 310 | I | Yes |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | | Street, discharging to manhole at Almond Street | | | |
| City of Syracuse | Water 16” to 30” | Renwick Ave. from a point approximately 320 feet south of Van Buren north through Van Buren intersection | 520 | I | Yes |
| | | Center of Monroe Street, to Almond Street, north up east side of Almond Street to Harrison Street, east to project limits within eastbound lanes | 1520 | I | Yes |
| | | Northern lanes of E. Adams Street between S. Townsend Street and S. McBride Street, crossing south to S. McBride Street | 650 | I | Yes |
| | | Under Harrison Street within project limits, crossing Almond Street | 3150 | I | Yes |
| | | Harrison Street branches crossing at S. Warren Street and S. Townsend Street | 190 | E/R | Yes |
| | | Center of E. Genesee Street within project limits | 500 | I | Yes |
| OCWA | Water 30” | Eastbound lane of E. Castle Street crossing under I-81 | 450 | I | Yes |
| Alliance | Gas 12” | East side of Renwick Avenue, continuing north along the east side of Almond Street to E. Taylor Street | 1000 | I | No |
| | | Crossing Almond Street at Burt Street, south side of street (two parallel lines) | 285 | I | No |
| National Grid | Gas 8" to 12” | South side of Burt Street crossing to east side of Almond Street, to north side of Van Buren Street, east to Irving Avenue, north to Irving Avenue project limit | 1660 | I | Yes on Almond St. only |
| | | South side of Monroe Street within project limits, east side of Almond Street north to north side of E. Adams Street, west across Almond Street to S. Townsend St. | 1505 | I | No |
| | | Crossing Almond Street at Harrison Street | 765 | I | No |
| | | Two lines at the west project limits of Harrison Street | 715 | E/R | No |
| | | North side of E. Genesee within project limits | 540 | I | No |
| | | North side of E. Fayette Street within project limits | 645 | I | No |
| AT&T | Underground Fiber Optic | Parallel to NYSW RR tracks (approx. 10 ft west of center of tracks) from I-81 south project limits to Almond Street, starting on east side of I-81 and crossing to west. | 1950 | I | Yes, south limits to Raynor Ave. |
| Verizon | Underground Fiber Optic | South side of Burt Street, crossing Almond Street, south to north of Van Buren St., east to Irving Ave. project limit | 1400 | I | Yes, on Almond St. only |
| | | Crossing E. Adams Street at S. Townsend Street | 95 | E/R | No |
| | | Crossing Almond Street south of E. Washington Street | 370 | I | No |
| Wind- | Underground | Two locations crossing E. Adams Street and | 410 | I | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| stream | Fiber Optic | Almond Street | | | |
| | | Crossing Harrison Street from south to north project limit, approx. 40 feet west of S. Warren Street | 45 | E/R | No |
| Elantic | Underground Fiber Optic | North side of Burt Street, west side of Almond Street, and south side of Taylor Street | 555 | I | No |
| Light Tower | Underground Fiber Optic | East side of Almond St. from Van Buren Street (at UP #NM13) to E. Taylor Street (UP# NYT22 NG25) | 765 | I | Yes |
| | | East side of Almond St. from pole 100' north of Monroe Street running north to Adams Street | 300 | E/R | No |
| | | North and south sides of E. Fayette Street from west project limits crossing Almond Street | 1460 | I | No |
| Syracuse University | Underground Fiber Optic | North side of Burt Street, north approx. 85', crossing Almond St., south to UP# NM13 on Van Buren St. | 890 | I | No |
| Telergy | Underground Fiber Optic | North side of Burt Street, crossing Almond St. to vault east side of Almond St. | 255 | I | No |
| Time Warner | Underground Fiber Optic | Multiple locations along and crossing Harrison Street | 600 | E/R | No |
| Upstate | Underground Fiber Optic | North of Harrison Street, crossing Almond Street from west to east project limit | 620 | I | No |
| Unknown | Underground Fiber Optic | East of Almond St. at Burt St. project limit to east project limit approx. 195' north of Almond St. | 215 | E/R | No |
| | | Multiple locations around and crossing Almond Street at E. Adams Street | 615 | I | No |
| | | West side of S. Townsend Street, crossing Harrison Street from south to north project limit | 100 | E/R | No |
| Light Tower/ Elantic | Overhead Fiber Optic | South side of E. Taylor Street within project limits, and extending north along east side of Almond Street to E. Adams Street. | 1570 | I | No |
| | | South side of Monroe Street within project limits | 100 | E/R | No |
| National Grid | Underground Electric | Multiple locations along Almond Street, Van Buren Street, Burt Street, E. Taylor Street, Jackson Street / Dyer Court, Monroe Street, E Adams Street, Harrison Street, | 19,305 | I | Yes, on east side of Almond St. from Van Buren St. to Burt St. |
| | Underground Electric Duct bank | Multiple locations along Almond Street and Van Buren Street | 3420 | I | Yes, on east side of Almond St. from Van Buren St. to Burt St. |
| | Underground Electric 2.4-13.2 kV | East side of Almond Street from E. Adams Street to Madison Street Two locations crossing Almond Street at E. Adams Street | 4075 | I | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | | Crossing Almond Street at E. Genesee Street | 555 | I | No |
| | Underground Electric 34.5kV | South sidewalk of Burt Street, crossing Almond Street from west to east project limit | 385 | I | No |
| | | Crossing Almond Street north of E. Genesee Street within project limits | 300 | I | No |
| | Underground Electric 115 kV | North side of E. Taylor Street at west project limit to a manhole in the center of Almond St., continuing southwest to SU Steam Station | 290 | I | No |
| | | South sidewalk of E. Fayette Street within project limits | 640 | I | No |
| Charter Communications | Underground Cable TV | Circling from north side of E. Genesee Street EB, to east side of Almond Street, to north side of E. Genesee Street WB | 490 | I | No |
| Syracuse University | Underground Telephone | Van Buren Street between Renwick Ave. and Irving Ave. | 1185 | I | No |
| Light Tower | Underground Telephone | South side of E. Adams Street within project limits | 1500 | I | No |
| Verizon | Underground Telephone | East side of Almond Street from south side of E. Adams Street to north side of Cedar Street | 1300 | I | No |
| Unknown | Underground Telephone | South sidewalk of Burt Street, from west to east project limits | 385 | I | No |
| Syracuse University | Chilled Water Service & Return 18” to 24" | Starting at Henry Street, crossing to north side of Van Buren Street, north at Renwick Avenue to Burt Street | 680 | E/R | No |
| | | Crossing Almond St. from the SU Steam Station to the east project limit | 165 | I | No |
| Syracuse University | Steam (12" to 14”) & Condensate (8" to 10”) | West side of Almond Street from Van Buren Street to Taylor Street | 870 | I | No |
| | | South side of Van Buren Street from Almond Street to Stadium Place | 555 | I | No |
| | | North and south sidewalks of Taylor Street within project limits | 730 | I | No |
| **I-81: Hiawatha Blvd to Butternut St. - Utility Impacts** | | | | | |
| **Owner** | **Type** | **Location** | **Length (FT)** | **Impact** | **Reimbursable?** |
| OCWEP | Sanitary Sewer 24" to 48" | 33" line crossing I-81 approx. 140 ft. south of Hiawatha Blvd W. | 300 | I | Yes |
| | | East Side of I-81 NB from Wolf Street to Hiawatha Blvd. | 550 | I | Yes |
| | | Approx. 160 ft. south of Hiawatha Blvd W. from eastern project limits to middle of I-81 SB | 160 | I | Yes |
| | | 48" line from middle of Bear St. from western project limits crossing I-81 | 700 | I | Yes |
| | | Middle of Sunset Ave within project limits near Court St. | 95 | I | Yes |
| City of Syracuse | Sanitary Sewer 24" to | Middle Genant Drive approx. 1000 ft. north of Butternut Street to approx. 350 ft. north of | 540 | I | Yes |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | 36" and unknown | Butternut Street | | | |
| | | West side of Sunset Ave within project limits | 125 | E/R | Yes |
| | | West side of N. State Street within project limits at intersection of Spencer Street and N. State Street | 125 | I | Yes |
| | | Middle of Basin Street from Kirkpatrick Street to southern project limits on Basin Street | 335 | I | Yes |
| | | Middle of Genant Drive from approx. 200 ft north of Court Street to south side of Bear Street | 885 | I | Yes |
| City of Syracuse | Water 20" and unknown | West side of N. State Street crossing Spencer Street | 125 | I | Yes |
| | | Middle of N. State Street crossing Butternut Street, with a line coming from Salt St. | 485 | I | Yes |
| | | Middle of Sunset Avenue near Court Street | 95 | I | Yes |
| | | West side of Sunset Avenue crossing Basin Street | 100 | E/R | Yes |
| OCWA | Water 24" | 2 parallel lines crossing I-81 Approx. 200 ft. south of Hiawatha Blvd W. | 600 | I | Yes |
| National Grid | Gas 16" | West side of I-81 SB on ramp near Destiny USA from western project limits to end of gas line. | 400 | I | No |
| | Gas 8" | 3 lines on East side of N. State Street at Spencer Street intersection | 390 | I | No |
| | Gas Unknown Size | Various locations on east side of I-81 NB, Bear Street, Spencer Street, Ash Street, Genant Drive, N. Clinton Street, and N. Franklin Street | 4400 | I | No |
| Elantic | Underground Fiber Optic | Crossing I-81 approx. 650 ft. north of Butternut Street | 375 | I | No |
| | | West side of N. Clinton Street within project limits at Genant Drive | 445 | I | No |
| Level 3 Com | Underground Fiber Optic | West side of I-81 SB starting from approx. 150 ft south of Hiawatha Blvd. W. extending to Bear Street | 1530 | I | No |
| | | South side of Bear Street within project limits | 850 | I | No |
| | | Middle of Genant Drive from Bear Street to W. Division Street | 3400 | I | No |
| Verizon | Underground Fiber Optic | Middle of N. Clinton St. from Spencer Street to southern project limits | 180 | I | No |
| | | Crossing I-81 approx. 400 ft. north of Butternut Street | 360 | I | No |
| | | West side of Genant Drive from 800 ft. north of Butternut Street, south for approx. 335 ft., east across I-81 to intersection of Butternut Street and N. State Street, then north on N. State Street to project limits | 940 | I | No |
| Unknown | Underground Fiber Optic | Middle of N. State Street at Butternut Street intersection | 290 | I | No |
| | | Middle of N. State Street at Spencer Street | 125 | I | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | | intersection | | | |
| National Grid | Underground Electric | Multiple locations on Hiawatha Blvd. W., Bear Street, N. Clinton Street, Sunset Avenue, Genant Drive, Spencer Street, Court Street, W. Division Street, Ash Street, and Butternut Street | 9370 | I | No |
| | Underground Electric 115 KV | Middle of N. State Street from northern to southern project limits at the intersection of Spencer Street and N. State Street | 125 | I | No |
| | | North side of W. Division Street from western project limits on W. Division Street, crossing I-81 to eastern project limits | 270 | I | No |
| | | West side of Genant Drive from approx. 350 ft. south of W. Division Street to intersection of Genant Drive and N. Clinton Street | 900 | I | No |
| **I-690: Leavenworth Ave to Franklin St. - Utility Impacts** | | | | | |
| **Owner** | **Type** | **Location** | **Length (FT)** | **Impact** | **Reimbursable?** |
| OCWEP | Sanitary Sewer 52"x78" | East side of Onondaga Creek heading northeast to eastern project limits at Butternut Street | 2010 | I | No |
| | Sanitary Sewer 72" | East side of Onondaga Creek heading east to project limits on N. Salina Street | 1280 | I | Yes |
| | Sanitary Sewer 72" | From northern project limits of Pearl Street to eastern project limits at N. State Street and James Street | 1455 | I | Yes |
| | Sanitary Sewer 72" | Varies approx. 30-100 ft on the east side of Onondaga Creek from northern project limits to southern project limits near Herald Place | 470 | I | Yes |
| City of Syracuse | Sanitary Sewer 30" to Unknown | Approx. 440 ft. west of West Street, crosses West Street to I-690 WB on ramp | 80 | I | Yes |
| | | From northern project limits on Herald Place to southern project limits on Wallace Street | 210 | I | Yes |
| Unknown Owner | Sanitary Sewer Size Unknown | Middle of Genesee Street from approx. 180 ft. from Wallace Street, east and then south at N. Franklin Street to project limits. | 710 | I | Probable |
| City of Syracuse | Water 16" to 20" | From intersection of W. Genesee Street & West Street south to project limits on West Street | 1075 | I | Yes |
| | | From intersection of W. Genesee Street & West Street across parking lot to project limits on Herald Place | 1030 | I | Yes |
| | | From intersection of W. Genesee Street & West Street heads west to project limits | 400 | I | Yes |
| National Grid | Gas Size Unknown | West side of West Street from Tracy Street to approx. 180 ft. north of Park Avenue and along south side of Park Ave to western project limits. | 665 | I | No |
| | | North side of Erie Blvd. from western project limits near West Street to eastern project limits | 365 | I | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| Elantic | Underground Fiber Optic | Middle of Genesee Street from Wallace Street to N. West Street | 620 | I | No |
| | | N. Franklin Street from Genesee Street to northern project limits | 90 | E/R | Yes, north of I-690 |
| Unknown | Underground Fiber Optic | Crosses Genesee St. in between N. Clinton St. and N. Salina St. | 135 | E/R | No |
| Verizon | Underground Fiber/ Telephone | Approx. 400 ft. west of West Street running N/S, crossing all I-690 Lanes | 260 | I | No |
| National Grid | Underground Electric | Middle of N. Clinton Street from southern limits to approx. 110 ft. north of Genesee Street | 210 | E/R | No |
| Unknown | Unknown Pipe 24" | Mounted on north side of Herald Pl bridge over Onondaga Creek | 190 | I | Unknown |
| **I-690: Franklin St. to Almond St. - Utility Impacts** | | | | | |
| **Owner** | **Type** | **Location** | **Length (FT)** | **Impact** | **Reimbursable?** |
| OCWEP | Sanitary Sewer 60" and 7.5'x10.5' | Middle of Burnet Avenue from western to eastern project limits near Catherine St. | 180 | I | Yes |
| | | 7.5'x10.5' line on the south side of Erie Blvd. from eastern project limits to western project limits | 1500 | I | Yes |
| City of Syracuse | Sanitary Sewer Size Unknown | Multiple locations on Herald Place, N. Salina Street, N. Clinton Street, N. Franklin Street, Wallace Street, McBride Street, Erie Blvd, E. Water Street, and Catherine Street | 975 | I | Yes |
| Unknown Owner | Sanitary Sewer 36" | Starts on west side of N. State Street approx. 150 ft. north of Erie Blvd. E. intersection. End location is unknown. | Unknown | I | Probable |
| OCWEP | Storm Sewer 24" to 36" | Various locations on Butternut Street, E. Willow Street, Erie Blvd, N. Warren Street, I-690, and I-81 | 1440 | I | Yes |
| | Storm Sewer 42" | Approx. 50 ft. east of VIP Structures from middle of N. Salina Street to VIP parking lot. | 105 | I | Yes |
| | Storm Sewer 7'x4.5' | Starts approx. 110 ft. east of N. Clinton Street then heads southeast reaching the southern project limits on E. Willow St. | 565 | I | Yes |
| | Storm Sewer Size Unknown | North side of Erie Blvd. east to McBride Street then back to Townsend Street on the south side of Erie Blvd. | 2600 | I | Yes |
| City of Syracuse | Water 16" to 24" | Middle of N. State Street from Burnet Avenue to Erie Blvd. E. | 625 | I | Yes |
| | | South side of E. Water Street within project limits | 775 | I | Yes |
| | | From eastern project limits near E. Laurel Street, crossing I-81 to meet water line at Butternut Street | 390 | I | Yes |
| | | East Side of Butternut Street from connecting | 590 | I | Yes |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | | water line to southern project limits on N. Franklin Street approx. 290 ft. north of Herald Place | | | |
| | | Middle of N. Franklin Street from I-690 EB to project limits at Herald Place | 275 | I | Yes |
| | | North side of Burnet Avenue within project limits | 180 | I | Yes |
| | | Middle of N. State Street from Burnet Avenue then turns west approx. 150 ft. north of Erie Blvd. E. and reaches the intersection on Erie Blvd. E. | 920 | U | Yes |
| | Water Unknown | Between Franklin Street and Clinton Street just south of I-690 EB | 360 | I | Yes |
| National Grid | Gas 8" to 12" | Multiple locations on east and west sides of N. Salina Street, east side of Townsend Street, east and west sides of N. State St., and east side of Catherine Street | 2100 | I | No |
| | Gas 16" | Multiple locations on west side of N. Franklin Street, east side of Townsend Street, north side of Erie Blvd, and north side of James Street | 4325 | I | No |
| | Gas 20" | Middle of N. Franklin Street from approx. 250 ft. north of Butternut Street to Herald Place | 770 | I | No |
| Elantic | Underground Fiber Optic | Middle of N. Franklin Street from approx. 150 ft. north of Butternut Street to Herald Place | 680 | I | No |
| | | Middle of Herald Place from eastern project limits, south on Wallace Street to southern project limits | 330 | I | No |
| | | South side of E. Water Street from western project limits to eastern project limits near Almond Street | 730 | I | No |
| Elantic / AT&T | Underground Fiber Optic | North side of E. Water Street from western project limits to eastern project limits near Almond Street | 800 | I | No |
| G4S | Underground Fiber Optic | North side of E. Willow Street from State Street to Erie Blvd. approx. 90 ft. north of the southern project limits at E. Water St. | 1200 | I | No |
| Charter Communications | Underground Fiber Optic | East side of N. State Street from Burnet Avenue to Erie Blvd. E. | 555 | I | No |
| | | North side of Burnet Avenue from western to eastern project limits near Catherine Street | 180 | I | No |
| Verizon & AT&T | Underground Fiber Optic | Middle of N. Salina Street from northern project limits approx. 300 ft. south of Pearl Street, south to southern project limits | 635 | I | No |
| Verizon | Underground Fiber Optic | Crosses N. Clinton Street near VIP Structures then goes west on I-690 WB until meeting N. Clinton Street | 835 | I | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | | Middle of Herald Place from N. Salina Street to western project limits near N. Clinton Street | 130 | I | No |
| | | North side of E. Willow Street from 100 ft. east of the western project limits, turns south onto N. Warren Street meeting another line at James Street | 570 | I | No |
| | | North side of James Street from N. State Street to N. Warren Street | 860 | I | No |
| | | Middle of State Street from Burnet Avenue to Erie Blvd. E. | 610 | I | No |
| | | Middle of Catherine Street from Burnet Avenue to E. Adams Street | 3630 | I | No |
| Wind-stream | Underground Fiber Optic | North side of E. Water Street from eastern project limits to Catherine Street | 125 | I | No |
| Unknown | Underground Fiber Optic | Multiple locations on E. Willow Street, James Street, N. State Street, and Burnet Avenue | 2365 | I | No |
| Unknown | Overhead Fiber optic | Multiple locations on E. Water Street, Catherine Street, Pear Street, and Hickory Street | 420 | I | No |
| Elantic | Overhead Fiber Optic | From western project limits on south side of E. Water St. | 125 | I | No |
| National Grid | Underground Electric Major Crossing | South side of E. Water Street from western project limits to eastern project limits near Almond Street | 770 | I | No |
| National Grid | Underground Electric 115 KV | Middle of N. Franklin Street from approx. 200 ft. north of Butternut Street to Herald Place | 715 | I | No |
| National Grid | Underground Electric | Multiple locations on Butternut Street, N. Franklin Street, Clinton Street, James Street, Salina Street, E. Willow Street, State Street, E. Water Street, Erie Blvd, and Townsend Street | 7915 | I | No |
| **I-690: Almond St. to Pine St. including Irving Ave and Crouse Ave - Utility Impacts** | | | | | |
| **Owner** | **Type** | **Location/Side** | **Length (FT)** | **Impact** | **Reimbursable?** |
| City of Syracuse | Sanitary Sewer 24" | Center of Crouse Ave from Genesee Street to Madison Street and crossing Crouse Ave at Madison Street | 575 | E/R | Yes |
| | Sanitary Sewer 24" to 48" | West side of Irving Ave from Fayette Street to Madison Street (48") and crossing Irving Ave at Madison Street | 1300 | E/R | Yes |
| | Sanitary Sewer 40”x60” to 36”x54” | Genesee Street & Crouse Ave intersection | 105 | E/R | Yes |
| OCWEP | Sanitary / Combined Sewers | Heading southwest from Crouse Ave and Washington intersection south to the Irving Ave and Fayette Street intersection then 36" x 60" | 775 | I | Yes |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | 24" to 60" | going west on Fayette Street | | | |
| | | Center of E. Genesee Street crossing Irving Ave and Crouse Ave | 215 | E/R | Yes |
| | | Center of Madison Street crossing Irving Ave and Crouse Ave | 185 | E/R | Yes |
| | | Center of Harrison Street crossing Irving Ave and Crouse Ave | 210 | E/R | Yes |
| | | East side of Crouse Avenue from Canal Street to Crouse Ave, to northern project limits | 545 | I | Yes |
| | | Center of Crouse Ave extending north from Adams St | 100 | I | Yes |
| | | Center of Burnet Avenue crossing Crouse Ave | 365 | E/R | Yes |
| | | Crossing I-690 approx. 275 ft east of Lodi Street | 165 | I | Yes |
| | 7.5' x 10.5' Combined Sewer | South side of Erie Blvd. Crossing from project limits east of Crouse Ave west to Almond Street, and crossing Walnut Street intersection | 1780 | E/R | Yes |
| City of Syracuse | Water 16" to 30" | Center of Water Street within project limits | 745 | I | Yes |
| | | East side of Irving Ave from approx. 220 LF north of Fayette St. to Fayette Street | 220 | I | Yes |
| | | East side of Irving Ave from Fayette Street to Harrison Street then west on Harrison Street, and crossings of Irving Ave at Genesee Street and Harrison Street | 1820 | E/R | Yes |
| | | West side of Crouse Ave from Burnet Avenue to Water Street | 1100 | I | Yes |
| | | Crossing of Crouse Ave at Genesee Street | 125 | E/R | Yes |
| | | Lodi Street at Burnet Avenue and Canal Street intersections | 300 | E/R | Yes |
| National Grid | Gas 8" to 12" | West side of Irving Ave approx. 140 ft south of Fayette Street south to approx. 240 ft south of Adams Street, and crossing at Fayette Street, Genesee Street, Madison Street, and Adams Street | 2440 | E/R | No |
| | | West side of Irving Ave from approx. 140 ft south of Fayette Street south to Genesee Street | 370 | E/R | No |
| | | North side of Canal Street and west side of Lodi Street within project limits | 740 | I | No |
| | | North side of Erie Blvd. within project limits | 2050 | E/R | No |
| | | North side of Fayette Street within project limits | 635 | I | No |
| | | North side of Water Street extending west from Crouse Ave | 765 | E/R | No |
| | | Crouse Ave and Burnet Avenue intersection area | 535 | E/R | No |
| | | Water Street and Walnut Avenue intersection area | 100 | E/R | No |
| Light Tower | Underground Fiber Optic | West side of Irving Avenue from Harrison Street to Madison Street | 450 | E/R | No |
| Elantic | Underground | South side of Burnet Avenue crossing Lodi | 165 | E/R | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | Fiber Optic | Street | | | |
| | | South side of Burnet Avenue crossing Crouse Ave | 365 | E/R | No |
| Wind-stream / Elantic | Underground Fiber Optic | North side of Water Street within project limits | 650 | E/R | No |
| | | South side of Erie Blvd. from approx. 100 ft west of Crouse Ave to approx. 75 ft west of Forman Ave | 1345 | E/R | No |
| Unknown | Underground Fiber Optic | East side of Crouse Ave from approx. 50 ft north of Erie Blvd. to Water Street then across Crouse Ave to the west | 335 | E/R | No |
| Charter Communications | Overhead Fiber Optic | West side of Lodi Street north of I-690 and crossing Burnet Avenue intersection | 215 | I | No |
| | | Multiple locations on Lodi Street, Walnut Street, Burnet Ave., Canal Street, Erie Blvd. and Crouse Ave. | 1145 | E/R | No |
| National Grid | Electric, Primary Transmission | Along south side of Fayette Street from Crouse Ave. to Irving Ave. | 490 | E/R | No |
| | | Crossing Irving Ave./Adams Street intersection, extending south along Irving Ave. to project limits | 310 | E/R | No |
| National Grid | Underground Electric | Crossing I-690 approximately 100 ft west of Lodi Street | 165 | I | No |
| | | SE corner of Water Street, Adams Street / Crouse Ave. intersection north along Crouse to Burnet Ave. | 730 | I | No |
| | | Multiple locations on Crouse Ave, Irving Ave., Burnet Ave., Lodi Street, Water Street, Adams Street, Harrison Street, and Genesee Street | 2400 | E/R | No |
| **I-81 / I-481 Southern Interchange - Utility Impacts** | | | | | |
| **Owner** | **Type** | **Location/Side** | **Length (FT)** | **Impact** | **Reimbursable?** |
| OCWEP | Storm Sewer 24" to 36" | Multiple locations along I-81 at Seneca Turnpike and E. Glen Ave, and at Brighton Ave | 990 | I | Yes |
| | Storm Sewer 60" | Along east side of I-81 SB, between bridges | 385 | E/R | Yes |
| | | Along east side of I-81 SB, between bridges approximately 875 ft north of Seneca Turnpike | 115 | I | Yes |
| | Storm Sewer 5' x 3' box | Double culverts along east side of I-81 SB, between bridges | 80 | E/R | Yes |
| OCWA | Water 24” | West side of Brighton Ave from southern limits to north side of Rock Cut Road intersection, then east on Rock Cut Road to project limits | 1680 | I | Yes |
| National Grid | Gas | Crossing I-81 at Seneca Turnpike | 530 | I | No |
| | | Crossing I-81 at E. Glen Ave | 295 | E/R | No |
| | | Along south side of Rock Cut Road and east side of Brighton Ave south of intersection | 500 | E/R | No |
| Verizon | Underground Fiber Optic | Crossing I- 81 at Seneca Turnpike | 625 | I | No |
| | | Along west side of I-81 SB from approximately 1200 ft north of Seneca Turnpike to E Glen Ave | 1390 | E/R | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| | | Crossing I-81 at E Glen Ave | 190 | E/R | No |
| National Grid | Electric, Underground | Varying locations along 81 at Seneca Tpk. and E Glen Ave and at Brighton Ave | 1355 | I | No |
| **I-481 / I-690 Eastern Interchange - Utility Impacts** | | | | | |
| **Owner** | **Type** | **Location/Side** | **Length (FT)** | **Impact** | **Reimbursable?** |
| National Grid | Gas | Crossing 481 at Manlius Center Rd. south side of bridge | 100 | I | No |
| Charter Communications | Optical Cable TV, Overhead | Crossing 481 at Manlius Center Rd. north side of bridge | 190 | I | No |
| **I-81 / I-481 Northern Interchange - Utility Impacts** | | | | | |
| **Owner** | **Type** | **Location/Side** | **Length (FT)** | **Impact** | **Reimbursable?** |
| OCWEP | Storm Sewer 24” to 36" | Crossing I-81 and I-481 at various locations within the project limits | 1115 | I | Yes |
| | Storm Sewer 60" | Crossing I- 81 approx. 200 ft north of I-481 NB | 210 | I | Yes |
| | | Crossing I-81 SB approx. 175 ft north of I-481 NB | 100 | I | Yes |
| | | Crossing I-81 NB approx. 175 ft north of I-481 NB | 110 | I | Yes |
| | Storm Sewer 84" | Crossing I-81 BS ramp to I-481 NB approx. 260 ft north of I-481 NB | 120 | I | Yes |
| | | Crossing I-481 NB ramp to I-81 NB approx. 285 ft north of I-481 NB | 100 | I | Yes |
| | | Crossing I-481 and I-481 NB ramp to I-81 NB approx. 1350 ft west of Thompson Road | 280 | I | Yes |
| | Storm Sewer Unknown Size | I-481 approx. 500 ft east of Thompson Road | 260 | I | Yes |
| National Grid | Gas Unknown size | Crossing I-81 on south side of S. Bay Road bridge | 310 | I | No |
| | | Crossing I-481 at west side of Thompson Road | 220 | E/R | No |
| OCWA | Water Unknown Size | Crossing I-81 north of S. Bay Road bridge | 300 | I | Yes |
| | | Crossing I-481 at east side of Thompson Road | 220 | E/R | Yes |
| Verizon | Underground Fiber Optic | Crossing I-81 north of S. Bay Road bridge | 320 | I | No |
| | | Crossing I-481 at east side of Thompson Road | 220 | E/R | No |
| Elantic | Underground Fiber Optic | Crossing I-81 approx. 100 ft north of I-481 NB | 220 | I | No |
| | | Crossing I-81 NB ramp to I-481 NB, I-481 NB ramp to I-81 NB, and open area between ramps | 1350 | I | No |

**Table 5-82**
**Potential Utility Conflicts - Community Grid Alternative**

**Legend:**
I: Impacted due to construction.
E/R: Existing to remain.
U: Unknown.

| Owner | Type | Location | Length (FT) | Impact | Reimbursable? |
|---|---|---|---|---|---|
| | | | | | |
| Charter Communications | Cable TV | Crossing I-481 at west side of Thompson Road | 220 | E/R | No |

### Railroad Facilities

Under the Community Grid Alternative, both the northbound and southbound I-481 bridges over the CSX mainline, which is also utilized by Amtrak, would need to be widened to three lanes and the shoulders would be widened to meet current standards. While there is not expected to be any direct impact to the railroad caused by the bridge widening and rehabilitation work, coordination with CSX has been initiated in preliminary design and will continue as design advances and throughout construction. No other impact to CSX, Amtrak or the Amtrak Syracuse station will be impacted by this alternative. Refer to **Table 5-30** for bridge design criteria that shall be used for widening of the existing I-481 Bridge over CSX Railroad.

Under this alternative, the existing New York Susquehanna &Western Railway Bridge will be replaced and approximately 1,600 linear feet of track will be realigned. The bridge replacement and track re-alignment is necessitated by the alignment of the new southern arterial between Martin Luther King East and Van Buren Street. Coordination with the NYS&W Railroad has been initiated in preliminary design and will continue as design advances and throughout construction. Preliminary plans showing the track re-alignment and bridge replacement are included in **Appendix A-1.** Refer to **Table 5-30** for bridge and track design criteria that shall be used for the NYS&W Railroad Bridge.

## LANDSCAPE AND ENVIRONMENTAL ENHANCEMENTS

### Landscape Development and Other Aesthetics Improvements

NYSDOT would provide or replace landscaping as a part of the overall enhancement and aesthetic improvements for this Project. Streetscape enhancements would be provided along Almond Street and portions of Erie Boulevard, West Street, and Crouse and Irving Avenues, as well as portions of connecting streets. Streetscape enhancements could include sidewalks, specialty pavements and aesthetic treatments for walkways, site furnishings such as benches and trash receptacles, landscape plantings, and green infrastructure. Streetscape enhancements would be designed to provide an overall sense of visual cohesiveness. Almond Street would include a landscaped median from Martin Luther King Jr., East to I-690, lending a distinctive character to the length of the roadway. The streetscape design

would promote safe and effective pedestrian and bicyclist circulation and comfort, and help facilitate social interaction.

**Visual Resources**

Visual resources within the project site and surrounding area are described in Section 6.4.3 of the DEIS.

**Environmental Enhancements**

Important points of entry from the proposed Interstate Highway system to the street network would be enhanced as gateways. Gateway enhancements would be developed to create a distinct and identifiable sense of entry and sense of place. These enhancements include establishment of a consistent theme or motif, use of specialty materials and site elements, historical elements, landscaping, signage, aesthetic earth forms, and sculptural elements to mark the entrance to the city. Gateways have been identified at the new West Street and Genesee Street intersection, new James Street exit at Oswego Boulevard through the creation of a new "Canal District," at the new Crouse and Irving Avenues interchange with I-690, and at the new Martin Luther King Jr., East entrance to the city.

**The West Street and Genesee Street Gateway** would be achieved by the elimination of the elevated highway infrastructure, bringing West Street to surface, and the creation of a normalized intersection. Pedestrian, bicycle, and visual connectivity across West Street would be greatly enhanced. Aesthetic treatments would be used at this intersection to create a heightened sense of arrival into the city. Pedestrian areas at the intersections would be enlarged to accommodate more amenity and for visual impact. Sculptural lighting elements would serve as vertical markers, reinforcing a sense of arrival. The use of color would be used to enliven and punctuate the space. Sculptural sign walls, landscape and seat walls, and enhanced landscaping would all be used to define a gateway area. Specialty pavements and patterning would be utilized on sidewalks, and interpretation on the history of the location would be incorporated into the pavements and plazas. Signage would orient visitors to the Creekwalk, Downtown, and surrounding neighborhoods.

The removal of the highway infrastructure in this location also would allow for the creation of shared-use (bicycle and pedestrian) paths along the west side of Onondaga Creek and the creation of an overlook at the historic Erie Canal Aqueduct under Erie Boulevard. A historic canal theme that builds on the newly visible Erie Canal Aqueduct could provide the basis for the design vocabulary at this location. Canal themed materials could include rustic stone and wood, as well as other industrial themed materials. Consideration of existing Onondaga Creekwalk elements, such as lighting, interpretive signage, furnishings, and pavement materials would be included to integrate with existing adjacent Onondaga Creekwalk segments north and south of the Project Area.

**The Clinton Street Gateway** is a gateway to the heart of the Downtown business district. Gateway enhancements would include landscape, low site walls, and aesthetic landforms just before passing under the elevated I-690. Other components of the gateway could include banners, lighting, and sculptural elements. Aesthetic enhancements to the I-690 Bridge would reinforce the sense of gateway and arrival. Gateway enhancements could be continued

south to Herald Place on Clinton Avenue to further reinforce the gateway corridor experience and establish a rhythm of street trees and streetlights to transition to the city streets beyond the project limits.

Under the Community Grid Alternative, the new interchange at **Crouse and Irving Avenues** would create a new gateway to University Hill's educational and medical facilities. A contemporary theme could be adopted for the design vocabulary at this location, reflecting technology and the progressive nature of the institutions. The design vocabulary could be extended along several blocks of both Crouse and Irving Avenues to create gateway corridors and reinforce the sense of arrival along these streets. The vocabulary would primarily consist of streetscape elements such as lighting, pavements, landscaping, and street furnishings that reflect a dynamic, forward-thinking community. The strategic use of color could underscore the sense of a dynamic environment. The Crouse and Irving Avenues Gateway would be provided only under the Community Grid Alternative.

**Martin Luther King Jr., East** would become the new gateway to the city when arriving from the south under the Community Grid Alternative. A gateway corridor would be developed beginning approximately 1,600 feet south of Martin Luther King Jr., East and extending north to Van Buren Street. South of MLK Jr., East, landscape plantings along either side of the road would provide a transition from the more rural Tully Valley to the south, and would heighten the sense of arrival into the city. Plantings in this zone could also complement traffic calming in this area as the highway comes down to grade. Beginning at MLK. Jr., East, street tree plantings, including a center planted median would line the corridor. Artistic site walls combined with landscape planting and street lighting would be a signature motif in this gateway corridor. The walls could incorporate local stone, signage, and artistic metal and would be repeated, with variation, along the corridor. Signage would address both the city, as well the universities. The Almond Street/Van Buren Street intersection would be developed as a gateway to the universities. Reconstruction of the railroad bridge could be considered as part of the gateway experience, incorporating aesthetic treatments to reinforce the sense of arrival. The MLK Jr., East Gateway would be provided only under the Community Grid Alternative.

The **Northern Gateway** along the northern segment of former I-81 would be achieved with landscape enhancements and aesthetic treatments to structures. Reconstructed bridges, abutments, and retaining walls would receive aesthetic treatments. Plantings along the highway would be provided to enhance the travel experience and create a sense of arrival. Under the Community Grid Alternative, a new exit from the former I-81 south would connect to the northern end of **Oswego Boulevard**, creating an entrance to Downtown that coincides with the historic alignment of the Oswego Canal. One block to the east, Pearl Street would be extended south, re-establishing its historic alignment, and would provide access to a northbound interstate on-ramp from Erie Boulevard. The new on-ramp and off-ramp, combined with a reinstated street grid, provide an opportunity to create a gateway district centered on the historic confluence of the Oswego and Erie Canals. A lumberyard and railroad also occupied the site historically. Their presence, combined with the canal, suggest the use of industrial themed materials such as stone and wood.

The Erie Canal Museum and mule driver's monument on the historic location of the towpath would be located at the heart of the district. Streetscape improvements along Erie Boulevard, including an interpretive towpath, would connect historic Clinton Square to the museum and to the mule driver's monument across the street.

Low, rustic stone walls that are evocative of the canal could potentially be located along Oswego Boulevard and Erie Boulevard, marking the entrance to the city. Sculptural banners that interpret canal boats, placed at intersections, would reinforce the sense of arrival. There is the potential for a fountain to evoke the historic presence of water on the site, and the incorporation of water in a rustic stone sign wall. An overhead pergola that incorporates supports that are reminiscent of historic structures on the site could define an outdoor event space. The Canal District Gateway would be provided only under the Community Grid Alternative.