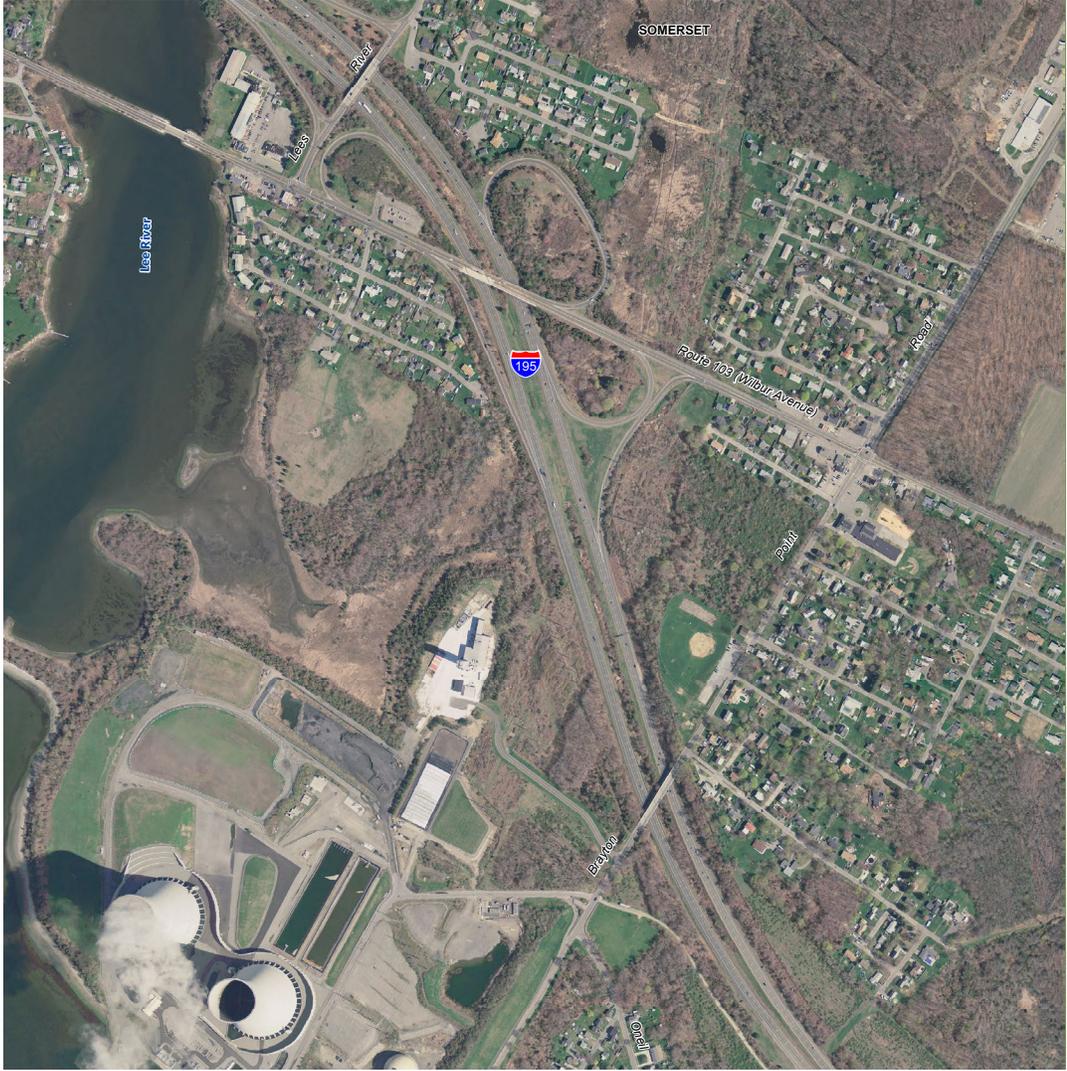


I-195 Interchange #4

Somerset, Massachusetts



PREPARED FOR



Town of Somerset, MA
MassDevelopment

PREPARED BY



1 Cedar Street, Suite 400
Providence, RI 02903

MARCH 2020

Final Report

I-195 Interchange 4 Transportation Study

Somerset, Massachusetts

PREPARED FOR

Town of Somerset, Massachusetts
MassDevelopment

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1 Cedar Street, Suite 400
Providence, RI 02903

MARCH 2020

This study was prepared by the Town of Somerset through a Site Readiness Program grant provided by MassDevelopment, the Commonwealth's economic development authority. Contributors to the study include: Richard Brown, Somerset Town Administrator; Nancy Durfee, Somerset Town Planner; Edmund Starzec, MassDevelopment; and the study consultant team led by VHB. The study process and recommendations were coordinated with staff from Southeastern Regional Planning & Economic Development District (SRPEDD) and MassDOT District 5 who contributed time and resources to review and advise the study team throughout the study process. Finally, the study recommendations were informed by residents, business owners, and other key town stakeholders through two public informational workshops.

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Executive Summary

The purpose of this study was to conduct an evaluation of I-195 Interchange 4 in Somerset, Massachusetts to identify circulation improvements, address inefficient traffic patterns, assess safety improvements, and evaluate how well the infrastructure handles new traffic demands from future developments.

The priority future development considered in this study is the re-development of the former Brayton Point Power Plant into the Brayton Point Commerce Center. Brayton Point will become a logistics, manufacturing, and support hub for offshore wind and other related industries supporting the emerging U.S. offshore wind energy sector.

Report Organization

This report is comprised of the following 5 chapters:

- › **Chapter 1 – Introduction.** Brief purpose of the study and methodology.

- › **Chapter 2 – Existing Conditions.** Detailed assessment of the existing roadway network, roadway/intersection geometry, traffic control, transit accommodations, pedestrian and bicyclist accommodations, traffic volumes, safety, peak hour operations, and environmental resources.
- › **Chapter 3 – Future Conditions.** Presents a 5-year traffic forecast and how well the infrastructure handles the added demands.
- › **Chapter 4 – Conceptual Improvements.** Presents short, mid, and long-term options for addressing the issues presented in Chapters 2 and 3.
- › **Chapter 5 – Conclusions and Next Steps.** Provides guidance on how this report’s findings and conclusions could be advanced by the Town.

Key Findings

The key findings from this study are as follows:

Existing Conditions (Chapter 2)

- › Inadequate “all red” clearance times at Route 103/Brayton Point Road has contributed to accidents, especially given the presence of large trucks blocking sightlines to the signal heads.
- › There are many circuitous travel patterns requiring several left then right turns – especially to I-195 westbound from Route 103 and to Brayton Point from I-195 eastbound.
- › There are many closely spaced driveways along Route 103, contributing to crashes from vehicles entering and exiting the roadway.
- › Illegal turning maneuvers occur occasionally, with vehicles crossing the double yellow centerline, requiring dangerous pinpoint turns. These occur at the on and off ramps along Route 103.
- › Unprotected left-turns along Route 103 at Lees River Avenue and Brayton Point Road, contribute to safety issues where through vehicles maneuver around queued left-turning vehicles with very limited sightlines.
- › There is inadequate geometry to efficiently accommodate large tractor-trailer trucks at Route 103/Brayton Point Road.
- › The traffic signal equipment on Route 103 at Brayton Point Road and Lees River Avenue is old and in generally poor condition with inefficient vehicle detection.
- › There is inadequate ramp spacing on I-195 westbound between the on-ramp from Route 103 and downstream off-ramp to Route 103, resulting in a weave area on I-195 westbound. The minimum required distance between these ramps is 1,600 feet based on federal standards. The two ramps are approximately 600 feet apart, well short of the minimum distance by 1,000 feet.
- › There is pedestrian equipment at Wilbur Avenue at Lees River Avenue and Wilbur Avenue at Brayton Point Road, however all the equipment is in poor condition. Additionally, there are no connecting sidewalks at these locations, except at Wilbur

Avenue at Brayton Point Road where there is sidewalk along the west side of Brayton Point Road, so the pedestrians/bicyclists are left with gaps in facilities. Pedestrians and/or bicyclists travel through the study area by utilizing the varying shoulders long the roadway.

- › Transit service is provided by the Southeastern Regional Transit Authority (SRTA) and there is one bus route that services the study area, Route 14 (Swansea Mall). A well used 144-space park-and-ride lot is located on Wilbur Avenue near Lees River Avenue. Route 14 is an important bus route in Somerset and the desire is that bus service is not reduced with the area mall closing.
- › I-195 carries 96,000 vehicles daily – by far the most of the study area roads. Wilbur Avenue (Route 103) carries 17,000 vehicles daily, Lees River Avenue carries 8,000 vehicles daily, and Brayton Point Road carries 1,600 vehicles daily.
- › A total of 146 crashes were recorded over a 5-year review period within the study limits. The intersection with the highest crash occurrence was Route 103 and Brayton Point Road, with 47 crashes occurring over the 5-year period.
- › Most of the crashes are rear-end and angle collisions resulting in property damage only. Rear-end and angle collisions are typical for intersection operations, especially at the two signalized intersections along Wilbur Avenue at Lees River and Brayton Point.
- › The two signalized intersections along Route 103 (Brayton Point Road and Lees River Avenue) experience high queuing and delays primarily on the eastbound approaches. Lees River Avenue operates at an unacceptable level-of-service (LOS) F in both morning and evening peak hours.
- › During the evening peak hour, the ramp approach to the intersection of Wilbur Avenue (Route 103) westbound at I-195 westbound off-ramp operates at a LOS F with about two minutes of delay and moderate queues. This location also experiences illegal U-turn maneuvers where vehicles make an illegal left-turn from the ramp to Wilbur Avenue.

Future Conditions (Chapter 3)

- › There are six planned developments within the study area that could have a notable effect on traffic/transportation operations on the roadways.
- › The analysis concludes that without any improvements, both intersections along Route 103 (Lees River Avenue and Brayton Point Road) are projected to be over capacity under future 2023 conditions during the morning and evening peak hours.
- › The following unsignalized locations are projected to degrade to LOS E or F under 2023 conditions during the morning or evening peak hours:
 - I-195 WB at I-195 Off Ramp to Wilbur Avenue (Route 103) WB
 - I-195 WB at I-195 Off Ramp to Wilbur Avenue (Route 103) EB
 - Lees River Avenue at I-195 EB Off Ramp
 - Wilbur Avenue (Route 103) EB at I-195 WB Off Ramp
 - Wilbur Avenue (Route 103) WB at I-195 WB Off Ramp

Conceptual Improvements (Chapter 4)

- › Using the evaluation criteria discussed in Chapter 1, a total of 16 improvement options were evaluated. Of these, 5 options were discarded from further consideration as a result of the screening and evaluation process.
- › The following candidate options are recommended to carry forward for future consideration:
 1. Route 103/Brayton Point Road - Added signal all-red clearance time & Signal Upgrade
 4. Route 103/Lees River Avenue - Intersection upgrade with new traffic signal equipment or roundabout
 5. Route 103 - Corridor restriping with bike lanes
 6. Route 103 - Corridor access management plan with driveway consolidation and/or reduction
 7. Roadway surface upgrade - Brayton Point Road
 8. Route 103/Brayton Point Road - Truck turn improvements with added turning lanes or reconfigured as a roundabout
 10. Safety Improvement (Weave Elimination) - remove underutilized on-ramp to I-195 WB from Route 103 EB
 11. Safety Improvement (Merge Elimination) - consider roundabout (or signal) at off-ramp from I-195 WB to Route 103
 13. Modify loop ramp onto I-195 EB from Route 103 WB
 14. Construct new off-ramp and on-ramp at Brayton Point Road along I-195 WB
 16. Conduct Road Safety Assessment (RSA) along Route 103 Corridor
- › The approximate timeframe assumed for the recommendations was as follows:
 - Short-term Actions - under 2 years - Short-term recommendations include actions that address existing safety and operational deficiencies through low cost options that can be implemented in a short timeframe, and with less effort, such as signal timing and phasing changes, signal installation, and roadway restriping.
 - Mid-term Actions - under 5 years - Mid-term recommendations include improvements that focus on the near-term future transportation infrastructure needs, have a longer permitting and design process, and can be more costly.
 - Long-term Actions - over 5 years - Long term recommendations include actions that will be needed to handle future roadway demands. These recommendations are capital intensive and often take longer periods of time to design, fund, permit, and construct.

Next Steps (Chapter 5)

- › This report, along with the Town's Comprehensive Master Plan, can be used as a planning tool to identify transportation priorities on a town-wide basis.
- › Next steps for the Town include:
 1. Synchronize the recommendations included in this study with other infrastructure priorities for the Town and develop a short, mid, and long term prioritized list.
 2. Coordinate with MassDOT and SRPEDD for the opportunity to integrate the recommendations into the state transportation plan for funding purposes.
 3. Prepare follow-on engineering studies and environmental reviews for the preferred options as required. For example, if the Town desires interchange modifications, the FHWA requires an Interchange Justification Report (IJR) be prepared. Doing so makes the projects as "shovel ready" as possible. Additionally, a MassDOT led Road Safety Audit (RSA) along the Route 103 corridor would be another recommended next step to advance project development.
 4. Prepare cost estimates for the preferred corridors and develop an implementation strategy for each. For example, reserving and acquiring right-of-way where needed as applicable.
 5. Coalesce support from Town stakeholders, such as businesses, residents and elected officials to advocate for the desired projects.

1

1 Introduction

This study involved completing a technical analysis of the I-195 ramps at Interchange 4, which intersect with Wilbur Avenue (Route 103) and Lees River Avenue. The analysis identified circulation improvements, inefficient traffic patterns, safety improvements, and quantifies new traffic demands from future developments.

1.1 Study Methodology

This traffic assessment was conducted in three stages and conforms to Massachusetts Department of Transportation (MassDOT) Transportation Impact Assessment (TIA) Guidelines. The first stage involved an assessment of existing traffic conditions, including an inventory of existing roadway geometry, observations of traffic flow, daily and peak period traffic counts, and a review of traffic safety. Environmental resource areas in the study area were mapped and field verified in the first stage of the study. The second stage of the study involved estimating future traffic demands by reviewing historic traffic trends from data on adjacent roadways and estimating traffic generated by planned or speculative projects over a 5-year horizon. The third and final stage of the study evaluated measures to mitigate, improve, and address existing and potential future deficiencies.

2

2 Existing Conditions

Evaluation of the transportation infrastructure requires a thorough understanding of the existing conditions including: existing roadway network jurisdiction, roadway/intersection geometry, traffic control, transit accommodations, pedestrian and bicyclist accommodations, traffic volumes, safety, peak hour operations, and environmental resources. Each of these elements is described in this chapter.

2.1 Study Area

A study area encompassing the interchange was identified for analysis, comprising of intersections (signalized and unsignalized), roadway segments, highway segments, and ramps. The study includes the following locations and their approach roadways as depicted in Figure 2.1:

- A. Wilbur Avenue at Lees River Avenue
- B. Wilbur Avenue Eastbound at I-195 Eastbound On-Ramp
- C. Wilbur Avenue Westbound at I-195 Westbound Off-Ramp
- D. Wilbur Avenue Eastbound at I-195 Westbound Off-Ramp
- E. Wilbur Avenue at Brayton Point Road
- F. Lees River Avenue at I-195 Eastbound Off-Ramp

- G. Lees River Avenue at I-195 Westbound On-Ramp
- H. Wilbur Avenue Westbound at I-195 On-Ramp
- I. I-195 Eastbound at I-195 On-Ramp from Wilbur Avenue Westbound
- J. I-195 Westbound at I-195 Off-Ramp to Wilbur Avenue Eastbound
- K. Wilbur Avenue Eastbound at I-195 On-Ramp
- L. I-195 Westbound at I-195 Off-Ramp to Wilbur Avenue Westbound
- M. I-195 Westbound at I-195 On-Ramp from Wilbur Avenue Eastbound
- N. I-195 Eastbound at I-195 On-Ramp from Wilbur Avenue Eastbound

Roadways are assigned a functional classification based on factors such as traffic demands, speeds, frequency of driveway access points, and adjacent land use. Functional classification defines the character of services that a particular roadway is intended to provide. Roads serve to provide mobility for vehicle access to locations. Roadways are organized into the following three classification categories:



1. Arterials provide the highest level of mobility at the greatest vehicular speeds for the longest uninterrupted distances. There are three types of arterials based largely on speeds and they are also categorized by area type (urban and rural): limited access principal arterials (Interstate highways); full access principal arterials; and full access minor arterials.

2. Collectors provide an intra-regional level of mobility, connecting the arterial network with the local roadways. There are two types of collectors and they are also categorized by area type (urban and rural): major collectors; and minor collectors.

3. Local Roadways provide lowest level of mobility by accessing adjacent land use, serving local trip purposes, and connecting to higher order roadways. These roadways have the most intersecting driveways and access points.

As Figure 2.1 illustrates, I-195 is classified as an *interstate*. Wilbur Avenue and Lees River Avenue are classified as *urban minor arterials*. Brayton Point Road is an *urban collector*.

The existing conditions analysis consisted of an inventory of the roadway and intersection geometry, traffic control, the collection of daily and peak hour traffic volumes, and a review of recent crash history.

2.2 Public Meeting Feedback/Observations

Public meetings were conducted in November 2018 and May 2019 for the project. The following key points were made by the attendees:

- › Inadequate “all red” clearance times at Route 103/Brayton Point Road, which has contributed to accidents especially given the presence of high-profile trucks. Red light running is common. People wait several seconds after the light turns green to avoid a collision with a red-light runner.
- › Many circuitous travel patterns requiring several left then right turns – especially to I-195 westbound from Route 103 and to Brayton Point from I-195 eastbound.
- › Many closely spaced driveways along Route 103, contributing to crashes from vehicles entering and exiting the roadway.
- › Illegal turning maneuvers, crossing the double yellow centerline, requiring dangerous pinpoint turns. These occur at the on and off ramps along Route 103.
- › Unprotected left-turns along Route 103 at Lees River Avenue and Brayton Point Road, contributing to safety issues where through vehicles maneuver around queued left-turning vehicles with very limited sightlines.
- › Excessive queues along Lees River Avenue extending from the Route 103 intersection which extend past the I-195 eastbound off-ramp, effectively blocking traffic on the ramp from proceeding onto Lees River Avenue.
- › Inadequate geometry to efficiently accommodate trucks at Route 103/Brayton Point Road.
- › It was noted that there are many accidents at the corner of Rogers Family Restaurant at Route 103/Brayton Point Road.
- › A four-way stop should be considered at Brayton Point Road and Wilbur Avenue.
- › Dedicated left-turn lanes and arrows are needed eastbound on Route 103.
- › Short-term needs include vegetation clearing at the major ramp entrance points and intersections along Route 103 as sightlines are obscured.
- › Consider moving the stop bars back to better accommodate large truck turns
- › Brayton Point Road, just east of I-195/bridge was recently repaved but is already in poor condition.
- › Add turning lanes at Lee's River Avenue and Wilbur Avenue.
- › At the intersection of Brayton Point Road and Wilbur Avenue, consider restriping the northbound approach to provide two lanes - a left/thru lane and right turn lane.
- › Speeding is a concern along Brayton Point Road, south of Route 103.
- › In addition to poor pavement conditions, the sidewalk is broken or discontinuous along Brayton Point Road south of Route 103.

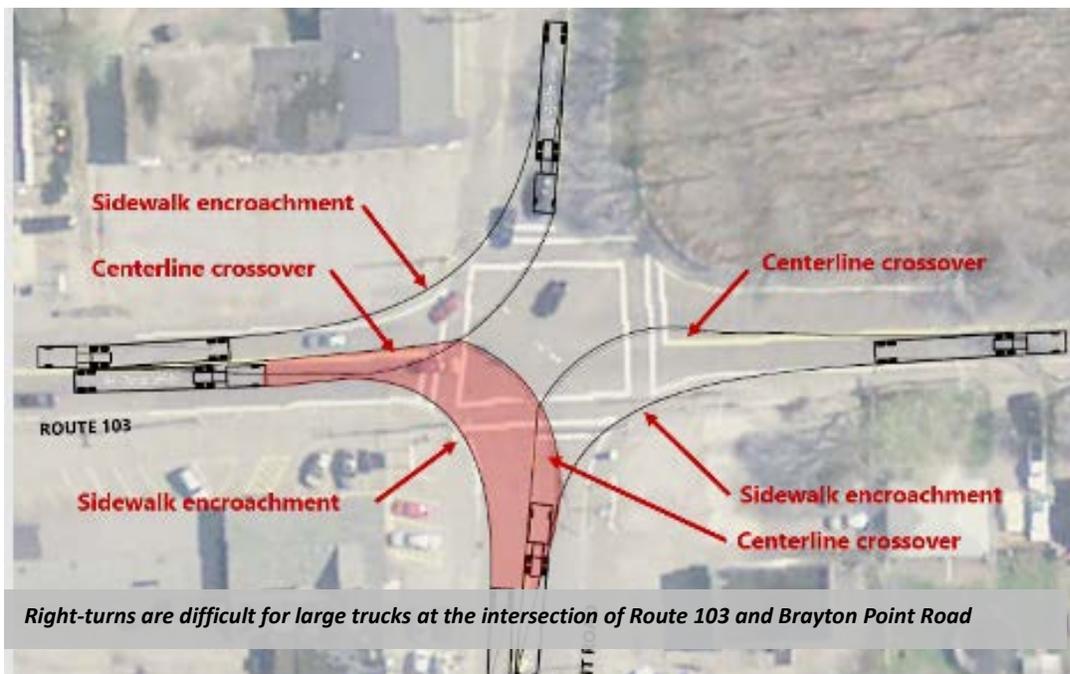
Detailed notes and slides from the public meeting are posted to the Town’s website, <https://www.townofsomerset.org/planning-board>.

2.3 Roadway Network

The study includes analysis of intersections on Wilbur Avenue (Route 103), Lees River Avenue, Brayton Point Road, and I-195. Descriptions of the study area roadways and intersections are described in this section. The functional classification for each roadway within the study area is depicted on Figure 2.1.

Generally, the current roadway network in this area has circuitous travel patterns, no protected left-turn lanes, and access management issues with too many curb cuts creating numerous conflict points. It was noted during a field visit and at the public workshop conducted for this study that there are many illegal movements occurring where drivers make hairpin U-turns on and off the ramps instead of taking the circuitous travel route.

Additionally, there are inefficient signal operations, which create long queues that block the I-195 off ramps. Finally, there are numerous large tractor trailer trucks that travel along both Wilbur Avenue and Brayton Point Road. These trucks have a very large turning radius that impact the flow of traffic due to their right turn maneuvers, which force them to swing into on-coming traffic or jump the curb onto the sidewalk to make the turn as shown in the illustration below. Figure 2.2 shows lane configuration and traffic control at the study intersections.



2.4 Roadways

The roadways in the study area include I-195, Wilbur Avenue, Lees River Avenue, and Brayton Point Road. They are briefly described in this section.

- › **Interstate 195 (I-195)** is classified as an interstate, has three lanes in each direction and is under MassDOT jurisdiction. The posted speed limit is 65 mph.
- › **Wilbur Avenue (Route 103)** is an urban minor arterial with one lane in each direction and is under MassDOT jurisdiction. The posted speed limit is primarily 40 miles per hour (mph) within the study limits.
- › **Lees River Avenue** is an urban minor arterial with one lane in each direction and is under the jurisdiction of the Town of Somerset. The posted speed limit along Lees River Avenue is 30 mph in the northbound direction and 35 mph southbound.
- › **Brayton Point Road** is an urban collector with one lane in each direction and is under the jurisdiction of the Town of Somerset. The posted speed limit is primarily 30 mph within the study area. Approaching the former Brayton Point Power Plant, Brayton Point Road becomes a private road.

2.5 Intersections

There are two signalized intersections in the study area. These intersections are Wilbur Avenue at Lees River Avenue and Wilbur Avenue at Brayton Point Road. All other intersections within the study area are un-signalized intersections or ramps.

An inventory of the two traffic signals, which involved opening the cabinet and recording timings and settings from the controller, indicated the following observations which were provided to MassDOT for reference:

Wilbur Avenue at Brayton Point Road



- › The traffic signal equipment is over 20 years old and in generally poor condition. Three out of four pedestrian pushbuttons are not ADA compliant, and ADA accessibility throughout the intersection is not fully compliant.

- › There are several missing signal head visors resulting in a “wash out” effect from the afternoon sun glare at the southerly facing signal heads.
- › The vehicle detection system is not efficient as there are loop detectors set back from the stop line, which requires the detection to be on “locking” memory (this scenario is generally avoided on modern installations). This was found to especially inefficient on the Brayton Point Road approaches during lighter traffic conditions. For example, if there is only a single vehicle on either of these approaches and the vehicle turns right on red, a call is locked into the controller causing it to be serviced even after the vehicle has already turned.
- › The Wilbur Avenue eastbound approach lane generally operates as two lanes for approximately 200 feet prior to the stop line. There is a heavy eastbound left-turn demand during the PM peak period and vehicles turning left tend to be positioned close to the double yellow line, allowing cars to bypass the standing left-turn queue.

Wilbur Avenue at Lees River Avenue



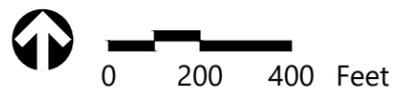
- › The traffic signal equipment is over 20 years old and in generally poor condition. The existing traffic signal cabinet is installed on wooden forms over a newly constructed foundation (installed in the same place as original foundation), and it appears that a new/larger cabinet has been installed by MassDOT.
- › The gas station driveway opposite Lees River Avenue is unsignalized.
- › The vehicle detection system along Wilbur Avenue is not efficient as there are loop detectors set back from the stop line, which requires the detection to be on “locking” memory (this scenario is generally avoided on modern installations that have stop line detection). There is stop line detection on the Lees River Avenue approach.

- › A constant call was observed on Wilbur Avenue in the controller, meaning that the signal phase is always activated even if a vehicle is not present.

2.6 Interstate Ramps

Five interstate ramps were evaluated on the existing I-195 ramp system for conformance with the American Association of State Highway Transportation Officials (AASHTO) design criteria. These ramps are highlighted in green on Figure 2.1. The AASHTO Geometric Design of Highways and Streets, 2018 7th Edition was referenced to determine if the ramps met minimum acceleration lengths for entrance terminals and ramp terminal spacing.

There is one location where there is insufficient ramp spacing, between the westbound on-ramp from Route 103 to I-195 (Ramp M) and the downstream I-195 off-ramp to Route 103 (Ramp L). The minimum required distance between these ramps is 1,600 feet. The two ramps are approximately 600 feet apart, short of the minimum distance by 1,000 feet. The close spacing of these ramps creates a weave maneuver where on-ramp traffic tangles with off-ramp traffic on the I-195 westbound mainline.



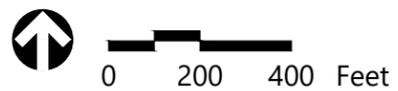
Study Area Intersections and Functional Class
I-195 Interchange 4 Transportation Evaluation
Somerset, Massachusetts

Figure 2.1



Legend

- Ⓢ Signal
- Lane Configuration
- A-N Study Area Intersection Key



Lane Configuration and Traffic Control
I-195 Interchange 4 Transportation Evaluation
Somerset, Massachusetts

Figure 2.2

2.7 Pedestrians and Bicyclists

There are crosswalks and ramps across all approaches at the intersection of Wilbur Avenue with Brayton Point Road, as well as across the northern and western approaches of Wilbur Avenue with Lees River Avenue and across the Wilbur Avenue westbound approach with the I-195 on ramp eastbound.

There is pedestrian equipment at Wilbur Avenue at Lees River Avenue and Wilbur Avenue at Brayton Point Road, however all the equipment is in poor condition. Additionally, there are no connecting sidewalks at these locations, except at Wilbur Avenue at Brayton Point Road where there is sidewalk along the west side of Brayton Point Road, so the pedestrians/bicyclists are left with gaps in facilities. As a result, pedestrians and/or bicyclists travel through the study area by utilizing the roadway shoulders.

There are no dedicated facilities for bicyclists in the study area, such as on-road bike lanes.

From the signal assessment, the intersection of Wilbur Avenue at Brayton Point Road has three non-compliant ADA pushbuttons and ADA accessibility throughout the intersection is not fully compliant.

Currently, there are future developments being proposed in the area that would provide sidewalks and make the study area more walkable/bikeable by closing the facility gaps. Additionally, the Town of Somerset is involved in a regional initiative to create a regional bike path, which could possibly run along Wilbur Avenue. Historically, Wilbur Avenue was a bike route to Swansea that connected to Riverside Avenue north toward Dighton. Bicycling and walking on Wilbur Avenue west of Brayton Point Road is difficult because the sidewalk ends, and it merges with a double lane road and the I-195 eastbound ramp with no sidewalks, resulting in bikes and pedestrians sharing the road space with merging highway ramp traffic.

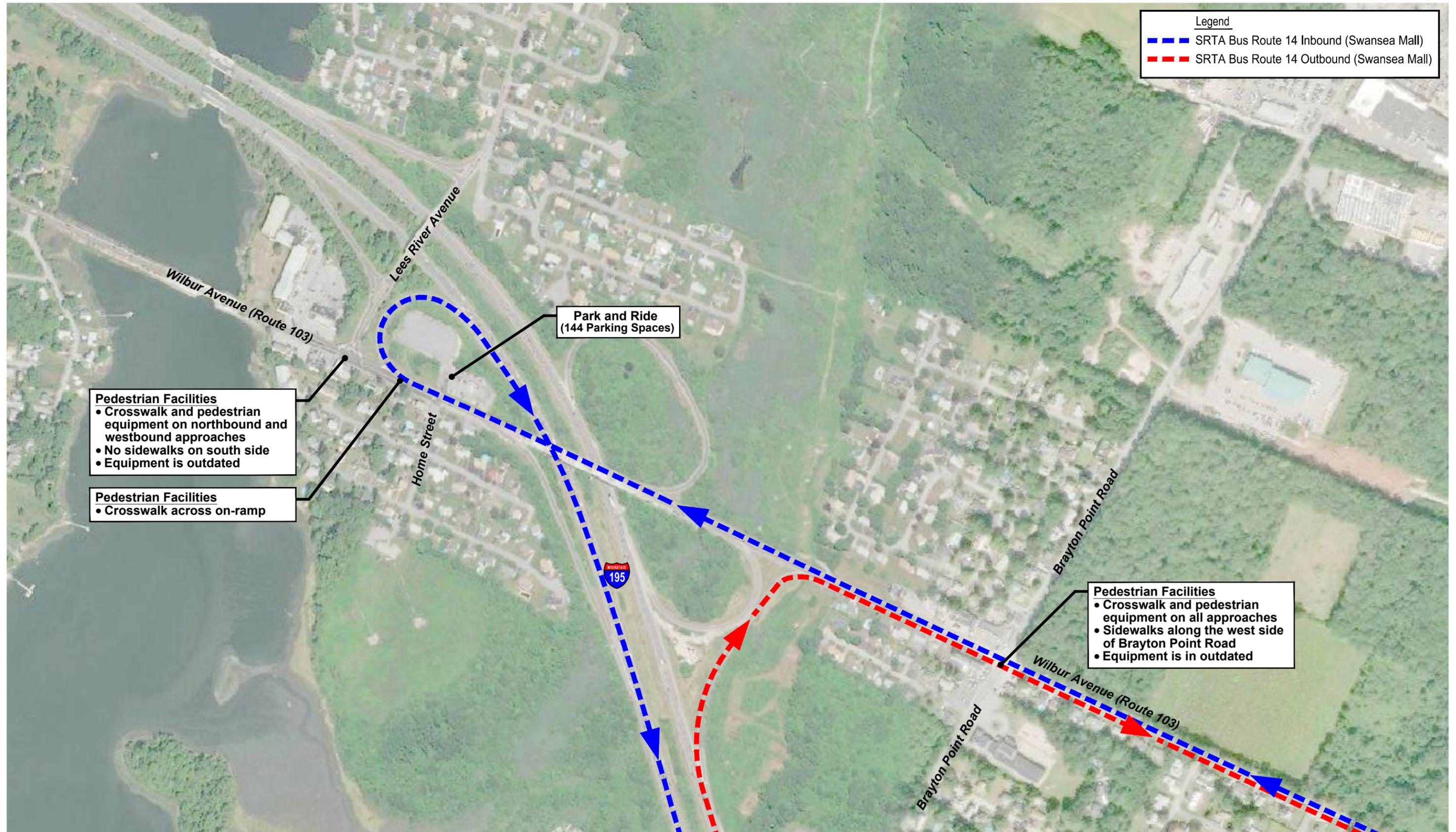
Figure 2.3 summarizes the existing multi-modal network in the study area.

2.8 Transit Services

Transit service is provided by the Southeastern Regional Transit Authority (SRTA) and there is one bus route that services the study area, Route 14 (Swansea Mall) as illustrated on Figure 2.3. Route 14 (Swansea Mall) travels along Wilbur Avenue from Lees River Avenue to Route 138. Service is provided weekdays from 8:30 AM to 9:30 PM at 1-hour intervals, Saturday service is provided from 8:30 AM to 6:30 PM at 1-hour intervals, and there is no service provided on Sundays. SRTA also provides demand response service for the entire service coverage area.

There is a well-used park-and-ride lot located with the study area, on the north side of Wilbur Avenue at 1759 Wilbur Avenue. The parking lot provides 144 parking spaces for carpool, vanpool, and Peter Pan commuter route service. Lot occupancy data from SPREDD indicates relatively high utilization but never to full capacity. Route 14 is an important bus route in Somerset and the desire is that bus service is not reduced with the area mall closing.

Figure 2.3 depicts the existing transit facilities with the study area.



Notes:

- There are no bicycle facilities within the study area. Bicyclists utilize the roadway shoulders.

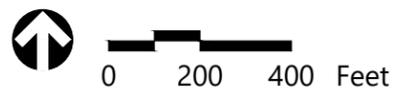


Figure 2.3

2.9 Traffic Volumes

The average daily traffic volumes were obtained from MassDOT (2017 and 2018), through existing available counts (2017), and through new counts for the key roadways within the study area taken in October 2018. The volumes are summarized in Table 2-1 and included in the Appendix. As shown in Table 2-1 and the accompanying chart:

- › **Interstate 195** carries approximately 96,300 vehicles on a typical weekday. Traffic flow along I-195 is even in each direction during the morning peak hour and evening peak hour.
- › **Wilbur Avenue (Route 103)** carries 17,000 vehicles on a typical weekday. Traffic flow along Wilbur Avenue is higher in the eastbound direction during the morning peak hour and in the westbound direction during the evening peak hour. As Wilbur Avenue is the main access point to I-195, the traffic flow patterns align with the commuter traffic going eastbound in the morning and westbound in the evening.
- › **Lees River Avenue** carries 8,000 vehicles on a typical weekday with the morning peak hour accounting for 6.9-percent of the weekday daily traffic flow and the evening peak hour accounting for 9.3-percent of the weekday daily traffic flow. Traffic is heavier in the southbound direction in the morning and in the northbound direction in the evening.
- › **Brayton Point Road** carries 4,800 vehicles on a typical weekday north of Route 103 and 1,600 vehicles on a typical weekday south of Route 103. Traffic is higher in the northbound direction in the morning and in the southbound direction in the evening.

Table 2-1 Existing Traffic Volume Summary

Location	Weekday ADT ¹	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Volume	K Factor ²	Dir. Dist. ³	Volume	K Factor ²	Dir. Dist. ³
Interstate 195 west of Lees River Avenue on/off-ramps	96,300	7,495	7.8%	50% WB	7,920	8.2%	52% WB
Wilbur Avenue (Route 103) at the Somerset Town Line	17,100	1,130	6.6%	67% EB	1,420	8.3%	62% WB
Lees River Avenue between the I-195 on- and off-ramps	8,100	565	7.0%	53% SB	755	9.3%	59% NB
Brayton Point Road north of Wilbur Avenue (Route 103)	4,800	500	10.0%	53% SB	550	11.5%	59% NB
Brayton Point Road south of Wilbur Avenue (Route 103)	1,600	115	7.2%	70% NB	145	9.1%	52% SB

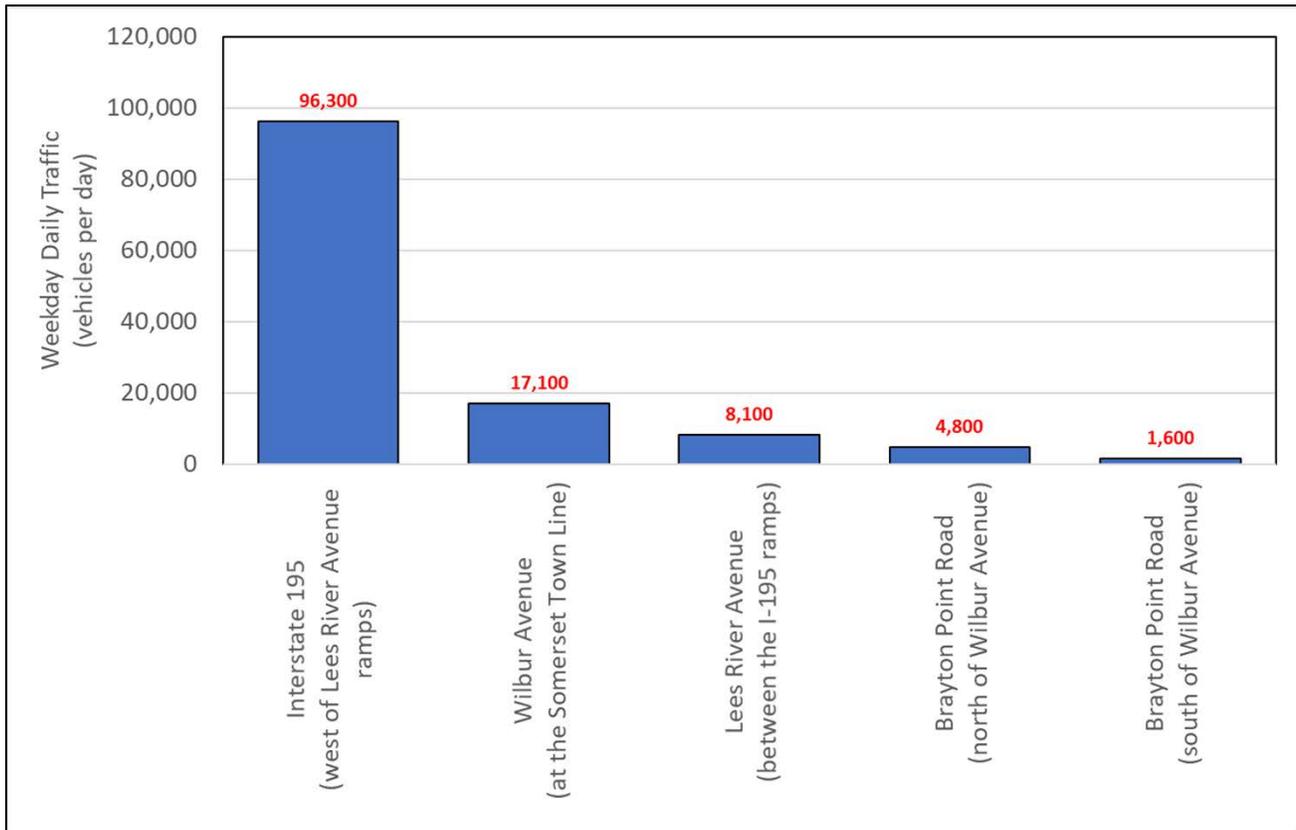
Source: Based on the latest available volumes from the MassDOT Transportation Data Management System.

Note: Peak hours do not necessarily coincide with the peak hours of turning movement counts. NA means not applicable; EB means eastbound; and WB means westbound.

1 Average Daily Traffic volume expressed in vehicles per day.

2 Represents the percent of daily traffic that occurs during the peak hour.

3 Directional distribution of peak hour traffic.



Traffic data were collected at the study area intersections in October and December 2018 during the weekday morning and evening peak periods from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. Traffic data were also obtained from MassDOT. The traffic volume data indicates that, within the study area, the weekday morning peak hour occurs between 7:00 AM and 8:00 AM and the weekday evening peak hour occurs between 4:30 PM and 5:30 PM.

Figures 2.4 and 2.5 summarize the AM and PM peak hour traffic volume networks for the study area. Note that the illegal U-Turn maneuvers are shown in red on Figure 2.5. The traffic volume data are provided in the Appendix.

2.10 Safety Review

To identify motor vehicle crash trends in the study area, the most current crash data for the study area intersections were obtained from MassDOT and the Police Department in the Town of Somerset for the five-year period from 2012 through 2016. A summary of the vehicular crash data is presented in Table 2-2 and Figure 2.6. The detailed safety analysis is included in the Appendix.

MassDOT obtains crash data from RMV records of reported crashes. The RMV maintains crash data records to help MassDOT develop safety improvement projects. The most up-to-

date crash data available to MassDOT as of July 2019 is through 2016. Data for 2017 and 2018 are under review and vetting by MassDOT.

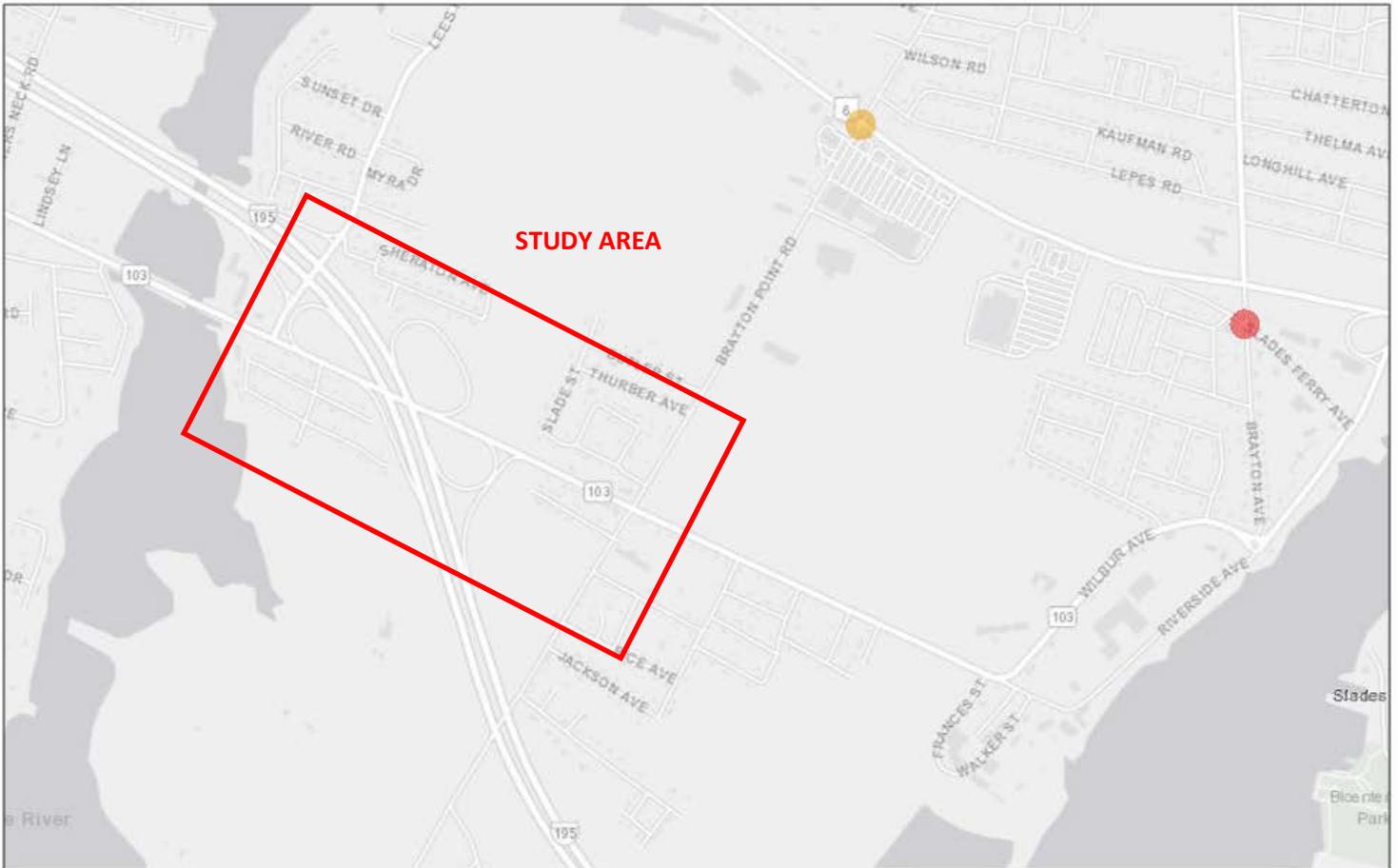
As shown in Table 2-2, a total of 146 crashes were identified over the 5-year review period within the study limits, 40 of which resulted in non-fatal injury. Most of the crashes at the study area intersections are rear-end and angle collisions resulting in property damage only. Rear-end and angle collisions are typical for intersection operations, especially at the two signalized intersections along Wilbur Avenue at Lees River and Brayton Point. No fatal crashes were reported at any of the study area intersections.

The intersection with the highest crash frequent is the intersection of Wilbur Avenue and Brayton Point Road where there were 47 crashes from 2012 to 2016. Of these 47 crashes, 10 involved injuries and were predominantly angle or rear-end collisions.

Additionally, each intersection was reviewed to determine if it was a MassDOT Highway Safety Improvement Program (HSIP) eligible *cluster*. An HSIP eligible *cluster* is one in which the total number of "equivalent property damage only" crashes is within the top 5 percent in the region. An "equivalent property damage only" crash is a method of factoring the crash frequency with the severity where crashes are weighed higher that are more severe in nature.

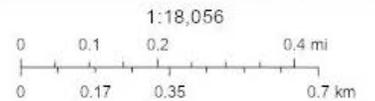
Within the study area, there are no tagged MassDOT HSIP clusters using data from 2012 to 2016 as shown in the image on the following page from the MassDOT data portal. There are crash clusters along Route 6, including the intersection of Route 6 and Brayton Point Road. (<https://gis.massdot.state.ma.us/topcrashlocations/>)

MassDOT Top Crash Locations (2012 to 2016)



8/12/2019 9:37:16 AM

- 2007-2016 HSIP Pedestrian Cluster
- 2007-2016 HSIP Bicycle Cluster
- HSIP Cluster 2014-2016
- Top 200 Intersection Cluster 2014-2016

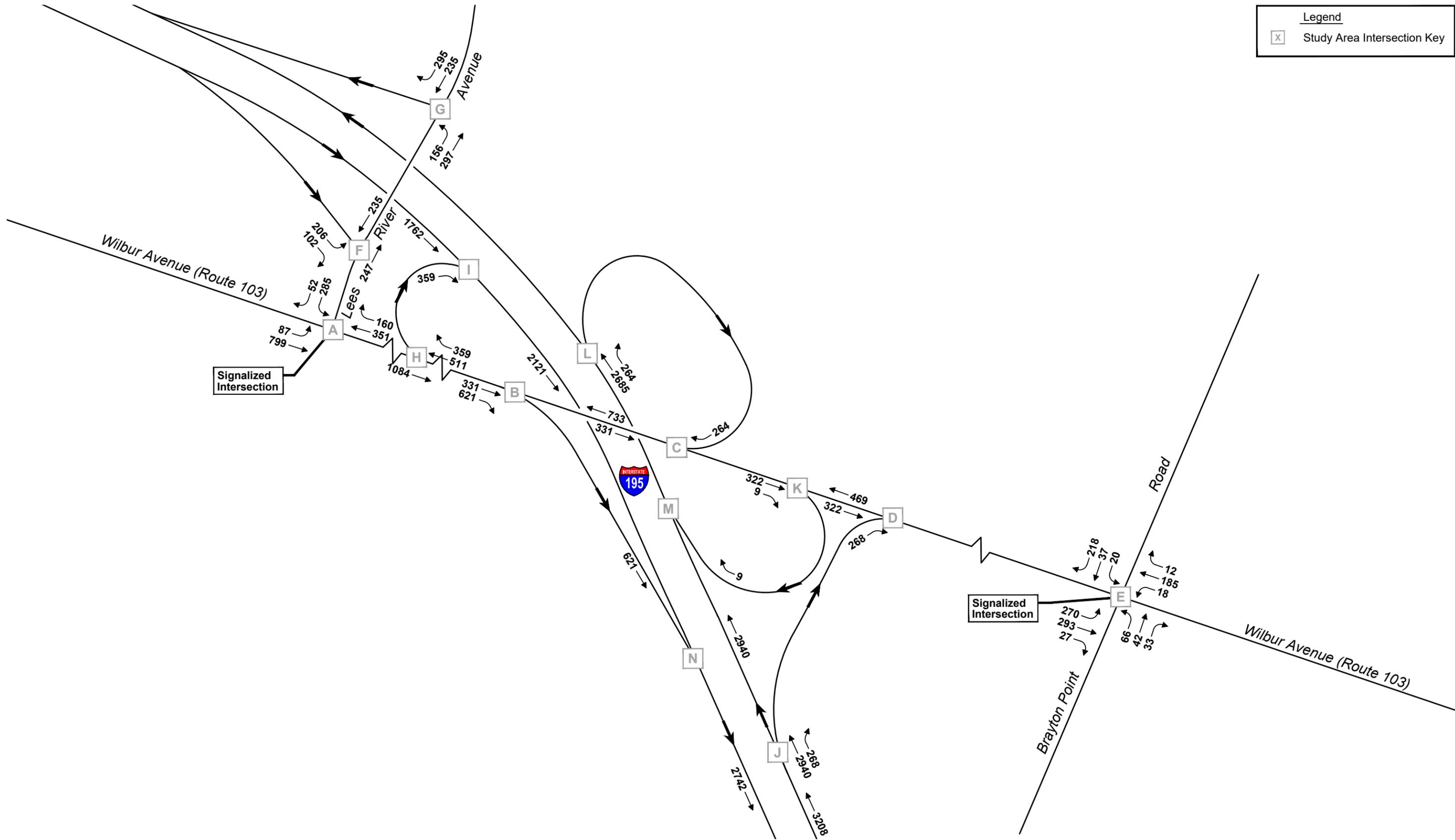


Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Web AppBuilder for ArcGIS

Source: MassDOT safety data portal accessed July 2019, <https://gis.massdot.state.ma.us/topcrashlocations/>

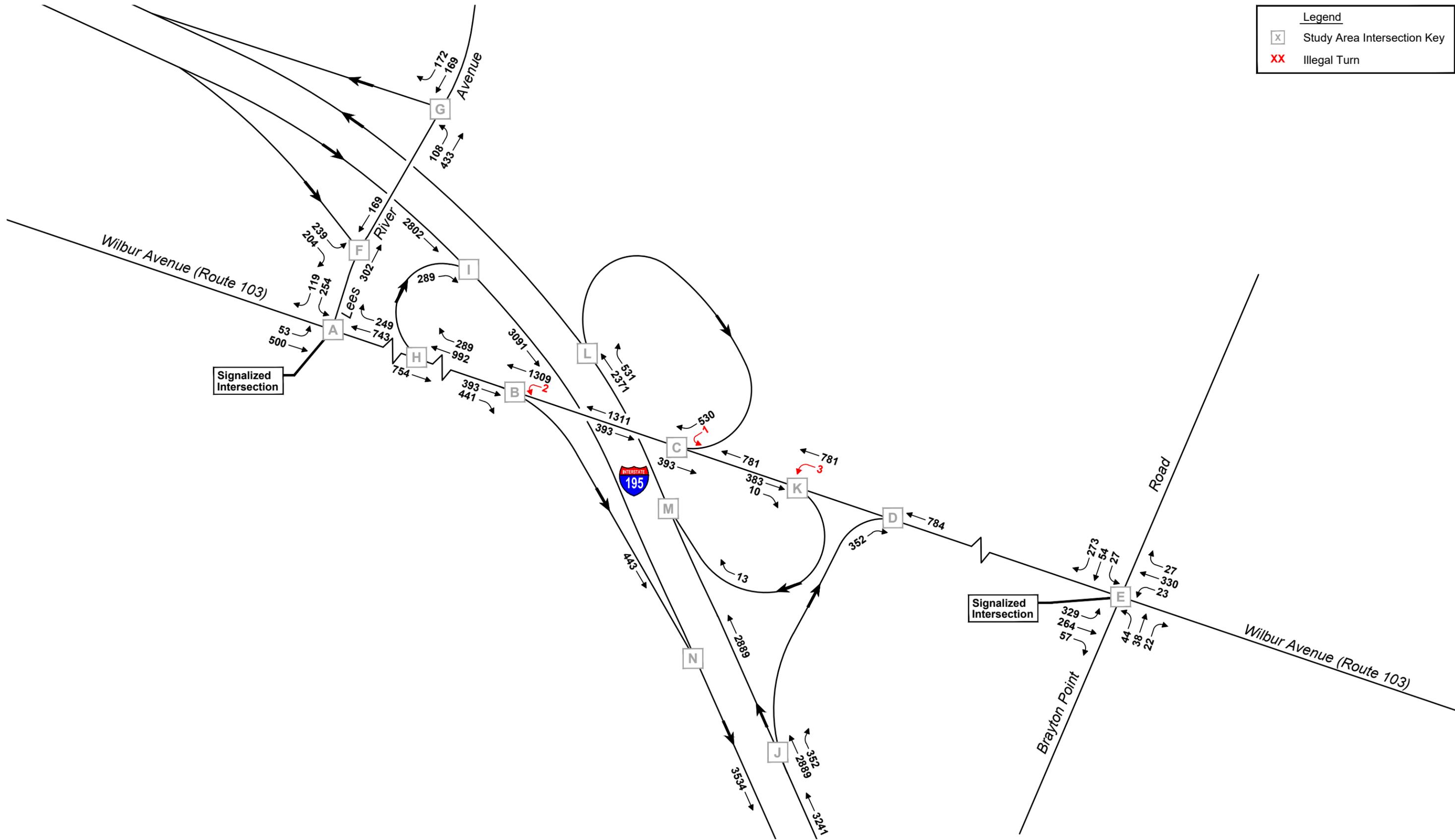
Legend

X Study Area Intersection Key



Legend

- X Study Area Intersection Key
- XX Illegal Turn



Not to Scale



2018 Existing Weekday Evening
Peak Hour Traffic Volumes
I-195 Interchange 4 Transportation Evaluation
Somerset, Massachusetts

Figure 2.5

Table 2-2 Intersection Vehicular Crash Summary (2012 – 2016)

	A. Wilbur Ave at Lees River Ave	B. Wilbur Ave at I-195 EB On-Ramp	C. Wilbur Ave WB at I-195 WB Off-Ramp	D. Wilbur Ave EB at I-195 WB Off-Ramp	E. Wilbur Ave at Brayton Point Rd	F. Lees River Ave at I-195 EB Off-Ramp	G. Lees River Ave at I-195 WB On-Ramp	H. Wilbur Avenue (Route 103) WB at I-195 On Ramp	I. I-195 EB at I-195 EB On-Ramp (East)	J. I-195 WB at I-195 WB Off-Ramp (East)	K. Wilbur Avenue (Route 103) EB at I-195 On-Ramp	L. I-195 WB at I-195 WB Off-Ramp (West)	M. I-195 WB at I-195 On Ramp from Wilbur Avenue (Route 103) EB	N. I-195 EB at I-195 On-Ramp from Wilbur Avenue (Route 103) EB
Signalized	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Year														
2012	5	0	3	0	6	2	1	0	0	0	0	0	3	0
2013	6	1	3	3	9	3	1	0	2	1	1	1	6	2
2014	9	0	8	2	15	0	0	0	0	0	0	0	6	1
2015	5	1	12	4	7	4	1	0	0	0	0	1	5	0
2016	7	2	2	4	10	0	1	0	0	0	0	3	5	0
Total	32	4	28	13	47	9	4	0	2	1	1	5	25	3
Average Crashes/Year	6.40	0.80	5.60	2.60	9.40	1.80	0.80	0.00	0.40	0.20	0.20	1.00	5.0	0.60
Crash Severity														
Fatal injury	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-fatal injury	7	2	10	3	10	3	0	0	2	1	1	1	3	2
Not Reported	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Property damage only (none injured)	25	2	18	10	36	5	4	0	0	0	0	4	21	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	4	28	13	47	9	4	0	2	1	1	5	25	3

Table 2-2 (cont.) Intersection Vehicular Crash Summary (2012 – 2016)

	A. Wilbur Ave at Lees River Ave	B. Wilbur Ave at I-195 EB On-Ramp	C. Wilbur Ave WB at I-195 WB Off-Ramp	D. Wilbur Ave EB at I-195 WB Off-Ramp	E. Wilbur Ave at Brayton Point Rd	F. Lees River Ave at I-195 EB Off-Ramp	G. Lees River Ave at I-195 WB On-Ramp	H. Wilbur Avenue (Route 103) WB at I-195 On Ramp	I. I-195 EB at I-195 EB On-Ramp (East)	J. I-195 WB at I-195 WB Off-Ramp (East)	K. Wilbur Avenue (Route 103) EB at I-195 On-Ramp	L. I-195 WB at I-195 WB Off-Ramp (West)	M. I-195 WB at I-195 On Ramp from Wilbur Avenue (Route 103) EB	N. I-195 EB at I-195 On-Ramp from Wilbur Avenue (Route 103) EB
Signalized	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Manner of Collision														
Angle	9	1	0	1	22	6	0	0	1	0	0	0	2	1
Head-on	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Rear-end	17	2	25	7	19	2	3	0	0	1	0	0	9	0
Rear-to-rear	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Sideswipe, opposite direction	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Sideswipe, same direction	3	0	2	0	2	0	0	0	0	0	0	0	4	0
Single vehicle crash	2	1	1	5	2	1	1	0	1	0	1	5	9	2
Total	32	4	28	13	47	9	4	0	2	1	1	5	25	3
Ambient Light														
Dark - lighted roadway	9	1	1	3	8	1	2	0	0	0	0	0	3	0
Dark roadway not lighted	0	0	1	2	0	1	0	0	0	0	1	3	4	0
Dark unknown roadway lighting	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Daylight	22	3	25	7	38	7	2	0	2	1	0	1	18	3
Dusk	1	0	0	1	1	0	0	0	0	0	0	1	0	0
Not reported	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	4	28	13	47	9	4	0	2	1	1	5	25	3

Source: MassDOT crash portal and Town of Somerset Police Records, accessed July 2019.

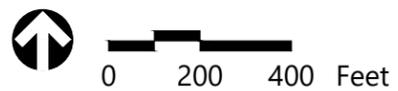


Figure 2.6

2.11 Operational Analysis

Measuring existing traffic volumes quantifies traffic within the study area. To assess quality of flow, roadway capacity analyses were conducted with respect to the 2018 Existing conditions. These analyses are included in the Appendix. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed on them.

Level-of-Service Criteria

Level of service (LOS) is the term used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers several factors including roadway geometry, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

For signalized intersections, the evaluation criteria used to analyze study area intersections are based on the percentile-delay method (SYNCHRO results). For unsignalized intersections, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. The level of service is only determined for left-turns from the main street and all movements from the minor street. The evaluation criteria used to analyze both the signalized and unsignalized intersections are based on the 2000 Highway Capacity Manual (HCM). It is noted that HCM 2000 results (instead of HCM 2010) results were used in this evaluation due to the signal phasing of the signalized intersections. Since the previous HCM 2000 version can analyze signalized intersections with non-NEMA phasing, it was used in the evaluation.

For interstate ramps, the evaluation criteria used to analyze study area ramps are based on Highway Capacity Software (HCS7) Freeway Facilities reports. These reports modeled freeway sections to determine the level of service, delay and speed for both the freeway and ramps. Included in this report is the ramp information only, as the study area is not evaluating the freeway but just the ramps.

Intersection Capacity Analysis

Intersection capacity analyses were conducted at all intersections in the study area. Analyses were conducted for the 2018 Existing conditions. Tables 2-3 through 2-5 summarize the capacity analyses for signalized, unsignalized and interstate ramp intersections, respectively.

Table 2-3 Signalized Intersection Capacity Analysis

Location/Movement	2018 Existing Conditions			
	V/C ¹	Delay ²	LOS ³	Queue ⁴
A. Wilbur Avenue (Route 103) at Lees River Avenue				
<i>Weekday Morning</i>				
EB L/T	>1.20	236	F	#1123
WB T	0.56	26	C	286
WB R	0.12	5	A	14
SB L/R	0.76	44	D	321
Overall		131	F	
<i>Weekday Evening</i>				
EB L/T	>1.20	1027	F	#792
WB T	1.11	98	F	#870
WB R	0.18	6	A	17
SB L/R	0.76	44	D	351
Overall		327	F	
E. Wilbur Avenue (Route 103) at Brayton Point Road				
<i>Weekday Morning</i>				
EB L/T/R	0.73	19	B	314
WB L/T/R	0.34	24	C	216
NB L/T/R	0.44	30	C	164
SB L/T/R	0.54	32	C	224
Overall		24	C	
<i>Weekday Evening</i>				
EB L/T/R	0.96	41	D	#646
WB L/T/R	0.67	24	C	#342
NB L/T/R	0.36	24	C	78
SB L/T/R	0.72	33	C	184
Overall		33	C	

Shaded entries denote LOS E or F conditions.

- 1 Volume to capacity ratio.
- 2 Average total delay, in seconds per vehicle.
- 3 Level-of-service.
- 4 95th percentile queue, in feet.
- ~ Volume exceeds capacity, queue is theoretically infinite.
- # 95th percentile volume exceeds capacity, queue may be longer.

Table 2-4 Unsignalized Intersection Capacity Analysis

Location/Movement	2018 Existing Conditions				
	Vol ¹	V/C ²	Delay ³	LOS ⁴	Queue ⁵
B. Wilbur Avenue (Route 103) Eastbound at I-195 Eastbound On-ramp					
<i>Weekday Morning</i>					
EB T/R	952	0.61	0	A	0
WB T	733	0.47	0	A	0
<i>Weekday Evening</i>					
EB T/R	834	0.53	0	A	0
WB T	1,311	0.00	0	A	0
C. Wilbur Avenue (Route 103) Westbound at I-195 Westbound Off Ramp					
<i>Weekday Morning</i>					
SWB R	264	0.51	18	C	73
<i>Weekday Evening</i>					
SWB R	531	>1.00	274	F	796
D. Wilbur Avenue (Route 103) Eastbound at I-195 Westbound Off Ramp					
<i>Weekday Morning</i>					
NEB R	268	0.42	14	B	53
<i>Weekday Evening</i>					
NEB R	352	0.63	20	C	112
F. Lees River Avenue at I-195 Eastbound Off Ramp					
<i>Weekday Morning</i>					
SEB L/R	308	0.59	20	C	94
<i>Weekday Evening</i>					
SEB L/R	443	0.79	29	D	190
G. Lees River Avenue at I-195 Westbound On Ramp					
<i>Weekday Morning</i>					
NB L/T	453	0.13	4	A	11
<i>Weekday Evening</i>					
NB L/T	541	0.09	2	A	8
H. Wilbur Avenue (Route 103) Westbound at I-195 On-Ramp					
<i>Weekday Morning</i>					
SEB R	359	NA	1	A	306
<i>Weekday Evening</i>					
SEB R	289	NA	3	A	276
K. Wilbur Avenue (Route 103) Eastbound at I-195 On-Ramp					
<i>Weekday Morning</i>					
NWB R	9	NA	5	A	15
<i>Weekday Evening</i>					
SEB R	13	NA	1	A	8

Shaded entries denote LOS E or F conditions.

- 1 Demand, in vehicles.
- 2 Volume to capacity ratio.
- 3 Average total delay, in seconds per vehicle.
- 4 Level-of-service.
- 5 95th percentile queue, in feet.

Table 2-5 Interstate Ramp Intersection Capacity Analysis

Location/Movement	2018 Existing Conditions		
	Speed	Delay ¹	LOS ²
I. I-195 Eastbound at I-195 On Ramp from Wilbur Avenue (Route 103) Eastbound			
<i>Weekday Morning</i>	51.0	15.3	B
<i>Weekday Evening</i>	50.8	20.2	C
J. I-195 Westbound at I-195 Off Ramp to Wilbur Avenue (Route 103) Eastbound			
<i>Weekday Morning</i>	54.5	22.2	C
<i>Weekday Evening</i>	54.1	23.2	C
L. I-195 Westbound at I-195 Off Ramp to Wilbur Avenue (Route 103) Westbound			
<i>Weekday Morning</i>	58.3	14.4	B
<i>Weekday Evening</i>	56.5	14.6	B
M. I-195 Westbound at I-195 On Ramp from Wilbur Avenue (Route 103) Eastbound			
<i>Weekday Morning</i>	58.3	14.4	B
<i>Weekday Evening</i>	56.5	14.6	B
N. I-195 Eastbound at I-195 On Ramp from Wilbur Avenue (Route 103) Eastbound			
<i>Weekday Morning</i>	50.9	19.1	B
<i>Weekday Evening</i>	50.8	20.2	C

¹ Demand, in vehicles.

² Level-of-service.

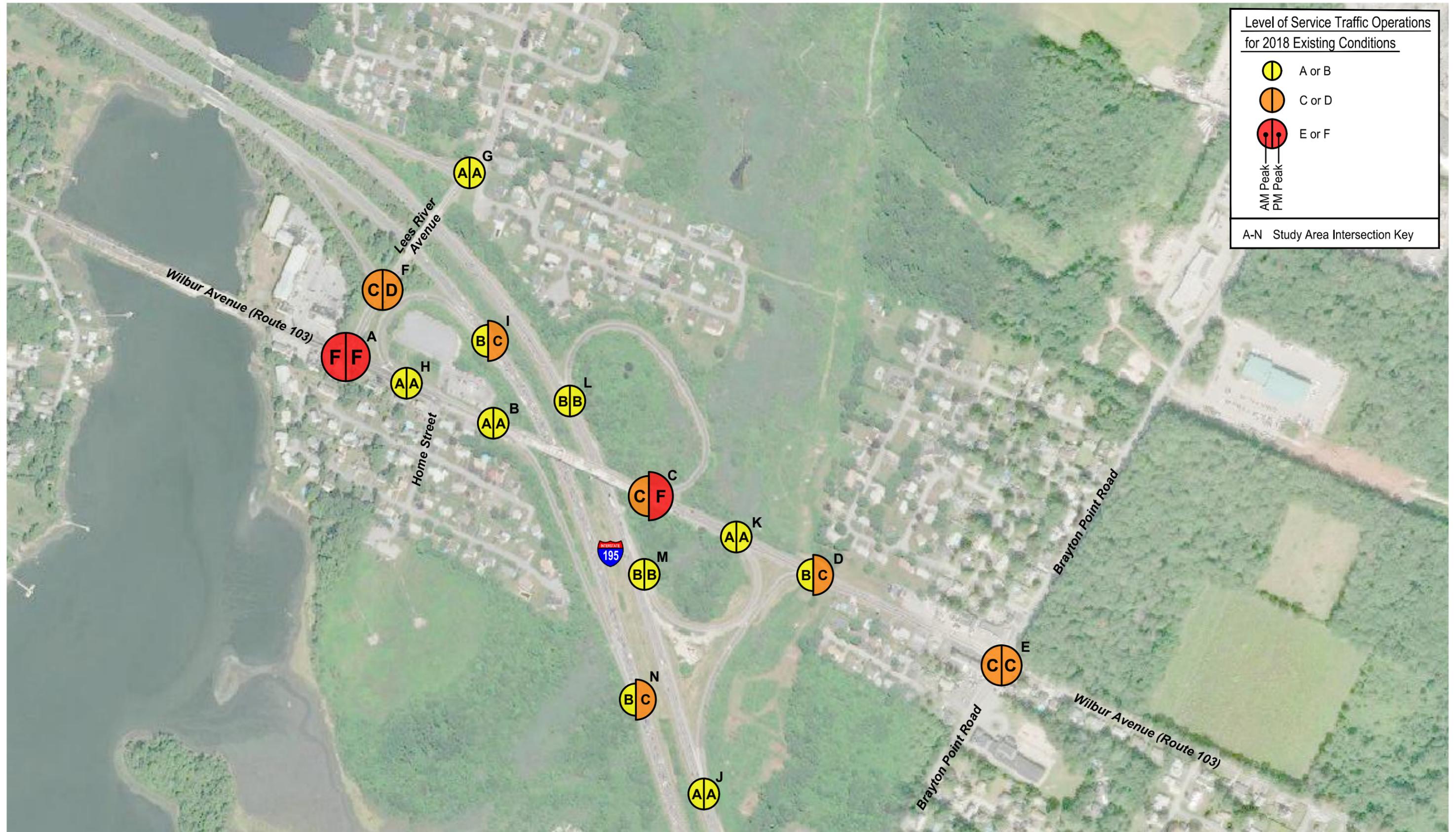
As shown in Table 2-3, the two signalized intersections operate poorly with high queuing and delays primarily on the eastbound approaches, but also on the southbound approaches. These poor operations worsen during the PM peak hour, due to peak hour congestion from commuter traffic. Field observations verified that long queues exist on the eastbound and southbound approaches.

It should also be noted that at both signalized intersections, eastbound through vehicles were generally observed to pass any left turning vehicles on the right, as the lane widths are large at the intersections (approximately 18 feet wide) and there are no protected left-turn lanes on any approaches.

Table 2-4 shows that in general, the unsignalized intersections operate at acceptable levels of service with low to moderate queuing and delays. However, during the PM peak hour, the ramp approach to the intersection of Wilbur Avenue (Route 103) westbound at I-195 westbound off-ramp operates at a LOS F with about two minutes of delay and moderate queues. This is due to peak hour commuter traffic congestion and as previously mentioned the inefficient traffic signal operations. All other unsignalized intersections operate at a LOS D or better during both peak hours.

Table 2-5 shows the Interstate ramps operate at acceptable levels of service with all ramps operating at a LOS of C or better during both the peak hours.

Figure 2.7 depicts the LOS for all the intersections for the existing conditions in the morning and evening conditions.



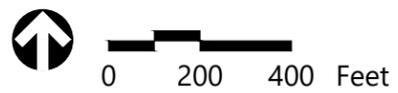
**Level of Service Traffic Operations
for 2018 Existing Conditions**

-  A or B
-  C or D
-  E or F

AM Peak
PM Peak

A-N Study Area Intersection Key

Notes:
1. Synchro HCS 2010



Level of Service
I-95 Interchange 4 Transportation Evaluation
Somerset, Massachusetts

Figure 2.7

2.12 Existing Environmental Resources

Before considering any potential enhancement to the roadway network, it is important to understand the extent of environmental resources in the area. Existing environmental resources in the study area were mapped using GIS and field verified by soil and wetland scientists.

Figure 2.8 summarizes the extent of the environmental resources observed, which include wetlands and Natural Heritage and Endangered Species Program (NHESP) mapped vernal pools. Culverts, catch basins, and drainage areas were also inventoried and are illustrated on Figure 2.8.

As shown, there are bordering vegetated wetlands surrounding the interchange ramps in several locations. There is a potential vernal pool identified by NHESP on the north side of Wilbur Avenue located to the east of Brayton Point Road. There is a second vernal pool to the north of the interchange in a wooded area just to the east of the residential subdivision off Lees River Avenue.

In conclusion, based on the GIS and field verification of environmental resources, any significant changes to on or off-ramps in the area of Interchange 4 is likely to impact wetland or drainage areas.

2.13 Existing Pavement Observations

A visual condition assessment was performed along Brayton Point Road, extending from Route 103 to the gated entrance of the former Brayton Point power plant (now the Brayton Point Commerce Center).

Brayton Point Road was divided into four segments based on the pavement condition:

- › Segment 1 – From Wilbur Avenue (Route 103) to the north end of the bridge over Interstate 195
- › Segment 2 – The I-195 Bridge Deck
- › Segment 3 – Segment 2 – From the south end of the bridge over Interstate 195 to O’Neil Road
- › Segment 4 – From O’Neil Road to the gated entrance of the Brayton Point power plant site.

This assessment results in the assignment of a Pavement Condition Index, or PCI, to the pavement section. The PCI is a number that varies from 0 to 100, with 100 representing a pavement in excellent condition and 0 describing a road in impassible condition. In general, roadways with PCIs over 70 are candidates for preventative maintenance or routine maintenance. PCIs between 60 and 70 typically indicate a deficient condition where the pavement surface needs added strength through an overlay. PCIs under 60 are generally considered in poor condition and in need of base improvement through reclamation or full depth reconstruction.

Segment 1 – From Wilbur Avenue (Route 103) to the north end of the bridge over I-195

- › The existing pavement here is in the best condition of the three segments; exhibiting light transverse and longitudinal cracking covering less than 25 percent of the area.
- › There were approximately 4 to 6 sawcut utility patches of moderate quality (one patch had severe distortion) along this segment.
- › Areas of partial delamination of the surface course of approximately 1.5 inches were also noted.
- › Applying typical values to these distresses yields a current **Pavement Condition Index (PCI) of 87.**
- › The width of this section was a minimum of 23 feet measured from the edge of pavement to the face of curb running along the northbound side.
- › Existing drainage consists of curbing and catch basins on the northbound side. On the southbound side, no engineered drainage was visible but a foreslope adjacent to the road exists along most of its length.

Utility Patches (no distortion)



Utility Patches (severe distortion)



Segment 2 – I-195 Bridge Deck

- › The bridge deck overlay is in fair condition with some transverse and longitudinal cracking with full delamination areas near the joints.
- › Some areas of distress were marked with paint indicating they may have been identified for future repair.

Segment 3 – From the south end of the bridge over I-195 to O’Neil Road

- › The existing pavement here is in moderate to poor condition; exhibiting medium severity block, transverse and longitudinal cracking (cracksealing over this distress has largely failed) over 50-75 percent of the area, medium severity alligator cracking (with isolated severe spots) over >5 percent of the area, 3-4 utility patches and a handful of areas of full delamination revealing a surface course thickness of ~1 inch.
- › Applying typical values to these distresses yields a current **Pavement Condition Index (PCI) of 63**.
- › The width of this section was a minimum of 23 feet measured from edge line to edge line with a total pavement width available of approximately 25 feet from berm to curb. Existing drainage consists of curbing and berm with catch basins.

Moderate transverse and longitudinal cracking



Severe alligator cracking



Segment 4 – From O’Neil Road to the gated entrance of the Brayton Point Commerce Center

- › The existing pavement here is in poor condition, the worst of the three segments; exhibiting medium severity alligator cracking over >20 percent of the area, moderate block cracking over >50 percent of the area, poorly sealed utility cuts, and extensive distortion/rutting due to apparent drainage issues.
- › Three strips of distortion and alligator cracking approximately 2 feet wide run longitudinally along the inner and outer wheelpath of the southbound lane, with an additional strip in the outer wheelpath of the northbound side.
- › Applying typical values to these distresses yields a current **Pavement Condition Index (PCI) of 47**.
- › The width of this section is a minimum of 22 feet measured from edge line to edge line with a total pavement width available of 29 feet.
- › Although this section had the flattest profile of the three segments, no existing drainage system was visible. Along most of the southbound side, an approximately 30 foot tall, 100 foot wide embankment slopes up from the roadway. At the toe of the slope is a crushed stone filled swale that appears intended to capture runoff from the slope only. The grassed area between the road and the stone swale does not permit surface runoff from the roadway surface and multiple puddles were observed along the southbound edge of pavement.
- › Similarly, the northbound side edge meets a raised grass margin with no visible swales, gutters, or basins along its length. Puddles were visible in depressed utility patches along approximately 30-50 feet of its length.

Distortion and alligator cracking in southbound wheelpath



Distortion and alligator cracking in northbound wheelpath



Poor drainage and puddling on northbound side



Existing swale off southbound side





Source: Aerial (USGS)
Wetlands (VHB)



Environmental Resource Assessment
I-195 Interchange 4 Transportation Evaluation
Somerset, Massachusetts

Figure 2.8

0 300 600 Feet

3

3 Future Conditions

This chapter builds on the existing conditions assessment presented in Chapter 2 and adds 5 years of projected traffic demands in the area from planned or speculative projects. Included is an assessment of how well the existing infrastructure can handle these new traffic demands.

3.1 Methodology

Traffic growth on area roadways is a function of expected land development, economic activity, changes to the transportation network, and changes in demographics.

Several methods can be used to estimate this growth. One method is to estimate an annual percentage increase and apply that increase to the existing study area traffic volumes. To estimate the annual percentage increase, historic traffic data is usually evaluated to determine the percentage growth.

Another method is to identify estimated traffic generated for planned developments that would affect the study area roadways. The traffic generated by planned developments is usually obtained through the surrounding towns/cities, transportation studies, or data acquired from a developer.

Due to an understanding of the study area and the status of proposed and planned developments, a combination of the two methods above were used to estimate future traffic.

3.2 Regional Traffic Growth

The 2023 No-Build traffic volumes were projected by applying a general growth rate to existing volumes and adding traffic volumes expected to be generated by specific proposed and planned development projects.

First, an annual growth rate was applied to the existing traffic volumes to reflect annual background traffic volume growth as a result of regional economic activity and development.

To estimate the annual percentage increase, historic traffic data was reviewed using the United States Census database and MassDOT Transportation Data Management System. Based on a review of historical traffic data over a 10-year period (between 2008 and 2017), traffic volumes in the study area generally remained consistent with little to no growth. Historic traffic volumes have fluctuated over the last 5 years, specifically from 2013 to 2017, with an approximate 0.5% average growth.

Table 3-1 Historic Traffic Volume Annual Growth Summary

Location	2017	2016	2015	2014	2013
Location ID: 6098	3%	1%	-1%	3%	-3%

Source: Based on the annual growth volume trends volumes from the MassDOT Transportation Data Management System.

To be conservative and to be consistent with the fluctuations between 2013 and 2017, a 0.5 percent per year annual growth rate was used in developing the 2023 baseline traffic volumes.

3.3 Project Specific Traffic Growth

Based on coordination with the Town of Somerset, transportation studies, and data acquired from developers, there are six planned developments within the study area that could have a notable effect on traffic/transportation operations on the roadways. The six planned developments included in the traffic growth are:



1. **Brayton Point Commerce Center** is redeveloping from the largest coal-fired power plant in New England to a logistical port and support center for offshore wind markets. The redevelopment will utilize the 300 acres of waterfront property and the deep-water port to support the emerging offshore wind energy sector. The developer has multiple scenarios for the activity level of the entities as they currently negotiating with multiple entities. Therefore, to be conservative, the high activity traffic volume scenario was utilized in this study and is contained in the Appendix. On a daily basis, the commerce center is expected to generate 960 vehicle trips, consisting of 650 passenger vehicles and 310 truck trips.
2. **Solar Therapeutics** received a provisional certificate from the State of Massachusetts for a medical marijuana facility to be located off Brayton Point Road to the north of Route 103. The facility will be approximately 66,000 square feet with about half that space used for growing both recreational and medical marijuana. This facility plans to ultimately sell a variety of products for both medical and recreational marijuana user once it receives all their permits. For this study, it was assumed that this facility would be acting as a full-buildout with all permits approved within the next five years.
3. **Wilbur School Redevelopment** will involve converting the former Wilbur School property to approximately 15 market-rate apartments with the possibility of converting the large multi-purpose room to a mixed-use area. The developer is still considering additional options for the undeveloped portion of the site, so for this study all out parcel areas were not included in the analysis.
4. **Wilbur Avenue at Brayton Point Road** parcel is a 98-acre undeveloped corner lot that is owned by the Town of Somerset. This property is currently being evaluated in the Town’s Master Plan to determine how best to utilize this property within the Town. Therefore, a conservative approach was considered for incorporating this property into the future conditions. Based on the size of the land area and considering zoning controls, it was assumed that a 320,000 square foot shopping

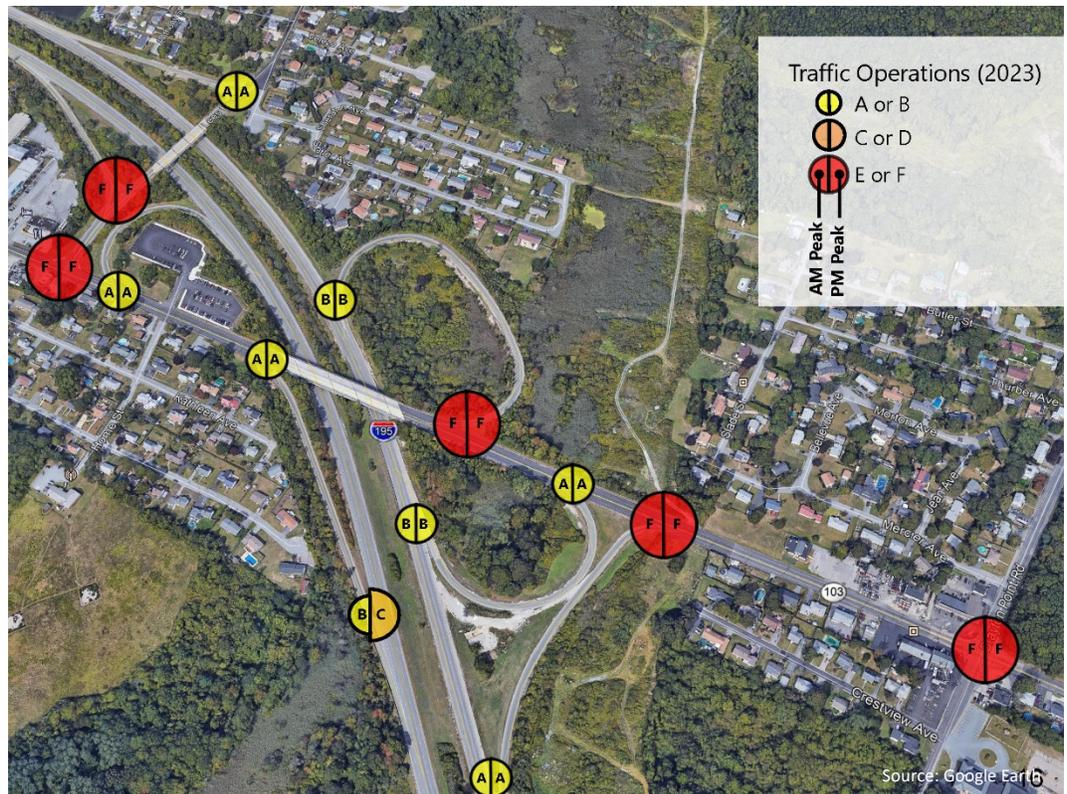
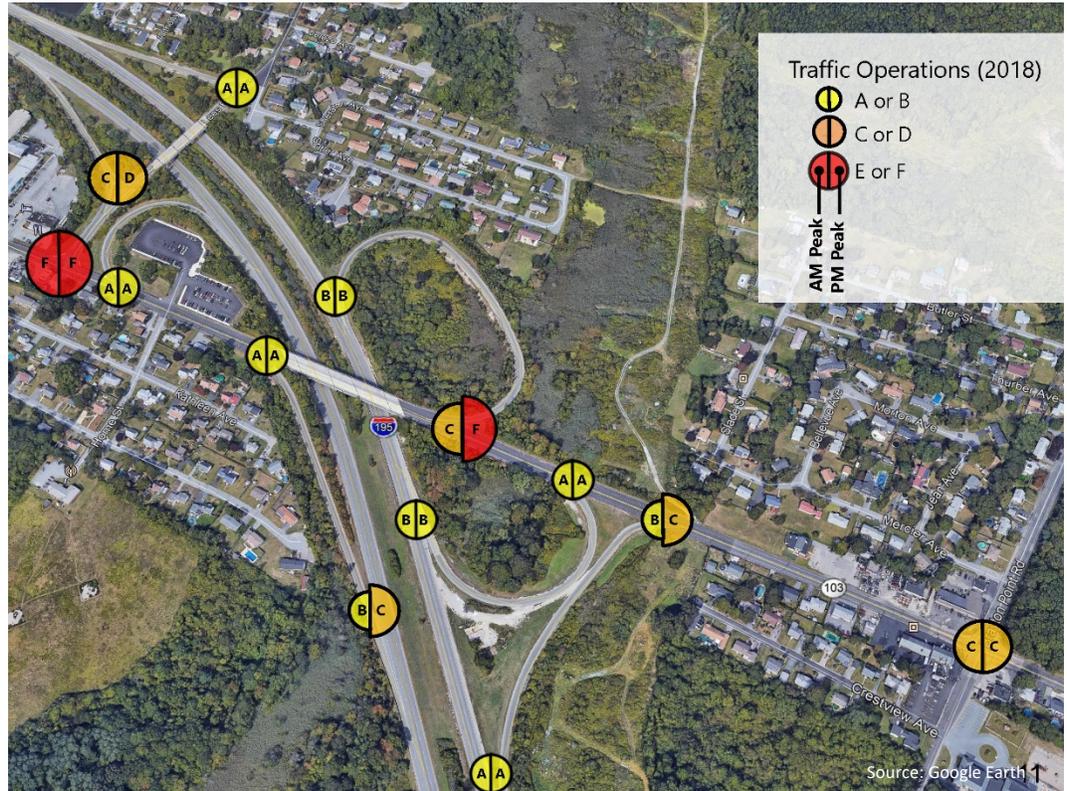
center (similar in nature to Mashpee Commons) was conservative assumption for the 5-year timeframe.

5. **Fairfield Commons Commercial Development** is a new development proposing an approximately 111-room hotel, two full service restaurants (5,700 square feet each), and a 4,500 square feet office building within the site along Route 6. These new developments would be encompassed in three new buildings on the 14.3-acre site. A traffic study was completed for this development in October 2018 called "Fairfield Commons Commercial Development".
6. **Slade's Ferry Crossing** is undergoing a redevelopment effort, which will include new development. The Town of Somerset asked for a market feasibility report to determine longer term market potential for the area, which was completed on January 15, 2015 by Stantec Consulting Services, Inc. and Bonz and Company titled "Slade's Ferry Crossing Market Feasibility Analysis". From this study, the new development includes approximately 75,000 square feet of retail and 220 residential units.

3.4 Future 2023 Conditions

The 2023 future traffic volumes were analyzed at each study area intersections and the results of these analyses are presented in Tables 3-2 and 3-3. Existing level of service results are also shown for comparison. As shown in each table, the differences between the existing condition and the future 2023 condition show an increase in traffic along Wilbur Avenue, especially at Brayton Point Road and Lees River. All of the freeway facilities (basic, merge, diverge, and weave segments) are expected to operate at LOS C or better with the exception of the basic segment EB direction southeast of Wilbur Ave which will operate at LOS D. For reference, the resulting 2023 Future Conditions weekday morning peak hour, evening peak hour and Saturday mid-day traffic volumes are contained in the Appendix.

The figures on the following page depict a comparison of the existing and 2023 operating conditions, highlighting the intersections that are projected to degrade.



The results of the 2023 Future conditions for signalized intersections are presented in Table 3-2.

Table 3-2 Signalized Intersection Capacity Analysis

Location / Movement	2018 Existing Conditions					2023 No Build Conditions				
	v/c ¹	Del ²	LOS ³	50 Q ⁴	95 Q ⁵	v/c	Del	LOS	50 Q	95 Q
A. Wilbur Avenue (Route 103) at Lees River Avenue										
<i>Weekday Morning</i>										
EB L/T	1.44	236	F	~880	#1123	1.78	389	F	~1065	#1313
WB T	0.56	26	C	200	286	0.65	29	C	245	347
WB R	0.12	5	A	0	14	0.26	6	A	0	19
SB L/R	0.76	44	D	249	321	1.33	198	F	~637	#754
Overall		131	F				214	F		
<i>Weekday Evening</i>										
EB L/T	3.18	1027	F	~577	#792	3.76	1287	F	~712	#937
WB T	1.11	98	F	~650	#870	1.26	157	F	~807	#1031
WB R	0.18	6	A	0	17	0.40	7	A	0	22
SB L/R	0.76	44	D	256	351	1.40	229	F	~713	#888
Overall		327	F				394	F		
E. Wilbur Avenue (Route 103) at Brayton Point Road										
<i>Weekday Morning</i>										
EB L/T/R	0.73	19	B	238	314	1.61	302	F	~1485	#1697
WB L/T/R	0.34	24	C	113	216	1.32	201	F	~768	#1011
NB L/T/R	0.44	30	C	76	164	1.08	135	F	~184	#345
SB L/T/R	0.54	32	C	98	224	1.15	144	F	~344	#549
Overall		24	C				238	F		
<i>Weekday Evening</i>										
EB L/T/R	0.96	41	D	169	#646	2.99	923	F	~1289	#1545
WB L/T/R	0.67	24	C	159	#342	2.13	545	F	~1021	#1266
NB L/T/R	0.36	24	C	37	78	0.82	41	D	109	#241
SB L/T/R	0.72	33	C	89	184	0.96	59	E	219	#426
Overall		33	C				600	F		

Shaded entries denote LOS E of F conditions.

- 1 Volume to capacity ratio.
- 2 Average total delay, in seconds per vehicle.
- 3 Level-of-service.
- 4 50th percentile queue, in feet.
- 5 95th percentile queue, in feet.
- ~ Volume exceeds capacity, queue is theoretically infinite.
- # 95th percentile volume exceeds capacity, queue may be longer.

The analysis concludes that without any improvements, both intersections along Route 103 (Lees River Avenue and Brayton Point Road) are projected to be over capacity under future 2023 conditions during the morning and evening peak hours.

The results of the 2023 Future conditions for unsignalized intersections are presented in Table 3-3.

Table 3-3 Unsignalized Intersection Capacity Analysis

Location/Movement	2018 Existing Conditions					2023 No Build Conditions				
	Vol ¹	V/C ²	Delay ³	LOS ⁴	Queue ⁵	Vol	V/C	Delay	LOS	Queue
B. Wilbur Avenue (Route 103) Eastbound at I-195 Eastbound On-ramp										
<i>Weekday Morning</i>										
EB T/R	952	0.61	0	A	0	1284	0.82	0	A	0
WB T	733	0.47	0	A	0	1221	0.78	0	A	0
<i>Weekday Evening</i>										
EB T/R	834	0.53	0	A	0	1220	0.78	0	A	0
WB T	1,311	0.00	0	A	0	2092	0.00	0	A	0
C. Wilbur Avenue (Route 103) Westbound at I-195 Westbound Off Ramp										
<i>Weekday Morning</i>										
SWB R	264	0.51	18	C	73	271	1.05	109	F	288
<i>Weekday Evening</i>										
SWB R	531	>1.00	274	F	796	544	4.55	Err	F	Err
D. Wilbur Avenue (Route 103) Eastbound at I-195 Westbound Off Ramp										
<i>Weekday Morning</i>										
NEB R	268	0.42	14	B	53	566	1.40	217	F	741
<i>Weekday Evening</i>										
NEB R	352	0.63	20	C	112	687	2.15	550	F	1417
F. Lees River Avenue at I-195 Eastbound Off Ramp										
<i>Weekday Morning</i>										
SEB L/R	308	0.59	20	C	94	560	1.12	101	F	489
<i>Weekday Evening</i>										
SEB L/R	443	0.79	29	D	190	746	1.54	272	F	1066
G. Lees River Avenue at I-195 Westbound On Ramp										
<i>Weekday Morning</i>										
NB L/T	453	0.13	4	A	11	659	0.30	6	A	32
<i>Weekday Evening</i>										
NB L/T	541	0.09	2	A	8	858	0.36	7	A	42
H. Wilbur Avenue (Route 103) Westbound at I-195 On-Ramp										
<i>Weekday Morning</i>										
SEB R	359	NA	1	A	306	593	NA	2	A	212
<i>Weekday Evening</i>										
SEB R	289	NA	3	A	276	660	NA	2	A	403
K. Wilbur Avenue (Route 103) Eastbound at I-195 On-Ramp										
<i>Weekday Morning</i>										
NWB R	9	NA	5	A	15	637	NA	1	A	NA
<i>Weekday Evening</i>										
SEB R	13	NA	1	A	8	454	NA	2	A	NA

Shaded entries denote LOS E or F conditions.

- 1 Demand, in vehicles.
- 2 Volume to capacity ratio.
- 3 Average total delay, in seconds per vehicle.
- 4 Level-of-service.
- 5 95th percentile queue, in feet.

Table 3-3 Unsignalized Intersection Capacity Analysis (continued)

Location / Movement	2018 Existing Conditions					2023 No Build Conditions				
	D ¹	v/c ²	Del ³	LOS ⁴	95 Q ⁵	D	v/c	Del	LOS	95 Q
I-195 WB at I-195 Off Ramp to Wilbur Avenue (Route 103) EB										
<i>Weekday Morning</i>										
NB T/R	3208	NA	2	A	NA	3580	NA	2	A	38
<i>Weekday Evening</i>										
NB T/R	3241	NA	2	A	NA	3649	NA	254	F	549
I-195 WB at I-195 On Ramp from Wilbur Avenue (Route 103) EB										
<i>Weekday Morning</i>										
NWB R	9	NA	5	A	15	9	NA	1	A	8
<i>Weekday Evening</i>										
NWB R	13	NA	1	A	8	13	NA	1	A	NA
I-195 WB at I-195 Off Ramp to Wilbur Avenue (Route 103) WB										
<i>Weekday Morning</i>										
NB T/R	2949	NA	2	A	NA	3023	NA	2	A	NA
<i>Weekday Evening</i>										
NB T/R	2902	NA	29	D	469	2975	NA	48	E	442

Shaded entries denote LOS E or F conditions.

- 1 Demand, in vehicles
- 2 Volume to capacity ratio.
- 3 Average total delay, in seconds per vehicle.
- 4 Level-of-service.
- 5 95th percentile queue, in feet.

The analysis concludes that without any improvements, the following locations are projected to degrade to LOS E or F under 2023 conditions during the morning or evening peak hours:

- › I-195 WB at I-195 Off Ramp to Wilbur Avenue (Route 103) WB
- › I-195 WB at I-195 Off Ramp to Wilbur Avenue (Route 103) EB
- › Lees River Avenue at I-195 EB Off Ramp
- › Wilbur Avenue (Route 103) EB at I-195 WB Off Ramp
- › Wilbur Avenue (Route 103) WB at I-195 WB Off Ramp

4

4 Conceptual Improvements

This chapter presents an assessment of potential conceptual improvements and discusses the degree to which they improve traffic operations, safety, and highway access. Candidate options include short, mid, and long-term recommendations. Environmental resource impacts or benefits are also discussed in this chapter.

Table 4-1 presents a summary of the conceptual improvements under consideration which are also described in this section. Each recommendation was vetted during the second public meeting for the project.

Table 4-1 Conceptual Improvements Under Consideration

Recommendation #	Candidate Improvement	Comments
1	Route 103/Brayton Point Road - Added signal all-red clearance time	Address red light running
2	Route 103/Brayton Point Road - Truck turn restrictions	Consider detouring tractor trailers straight on to Brayton Pt up to Rt 6 and down to Lee's River Ave to get on the 195
3	Route 103/Brayton Point Road - 4-way STOP control	Evaluate feasibility of 4 way stop
4	Route 103/Lees River Avenue - Intersection upgrade with new traffic signal equipment	MassDOT jurisdiction for these signals
5	Route 103 - Corridor restriping with bike lanes	Add turn lanes at intersections as feasible. Add bike lanes where feasible/desirable
6	Route 103 - Corridor access management plan	Reduce driveway width and number of driveways where possible
7	Roadway surface upgrade - Brayton Point Road	Prioritize segment from I-195 bridge to former power plant and after Brayton Point Commerce Center construction activity has diminished
8A, 8B, 8C, 8D	Route 103/Brayton Point Road - Truck turn improvements	Options considered include shifted stop lines, turning restrictions, installation of a roundabout, construction of a bypass road
9	Centerline rumble strips on Route 103 to discourage U-turns	Ease of implementation Noise and maintenance concerns
10	Safety Improvement (Weave Elimination) - remove underutilized on-ramp to I-195 WB from Route 103 EB	low volume, addresses safety issue
11	Safety Improvement (Merge Elimination) - consider roundabout (or signal) at off-ramp from I-195 WB to Route 103	addresses safety issues and weave; improves circulation
12	Safety Improvement (Weave Elimination) - remove off-ramp from I-195 WB to Route 103 WB and add signal (or roundabout) at remaining I-195 WB off-ramp	long-term project requiring federal and state approvals
13	Modify loop ramp onto I-195 EB from Route 103 WB	Consider roundabout at the base of the ramp
14	Construct new off-ramp and on-ramp at Brayton Point Road along I-195 WB	Major infrastructure project with potential environmental impacts
15	Consolidate ramp movements along I-195 WB with construction of a service road	Major infrastructure project with likely environmental impacts and high costs
16	Conduct Road Safety Assessment (RSA) along Route 103 Corridor	Focus on high crash locations

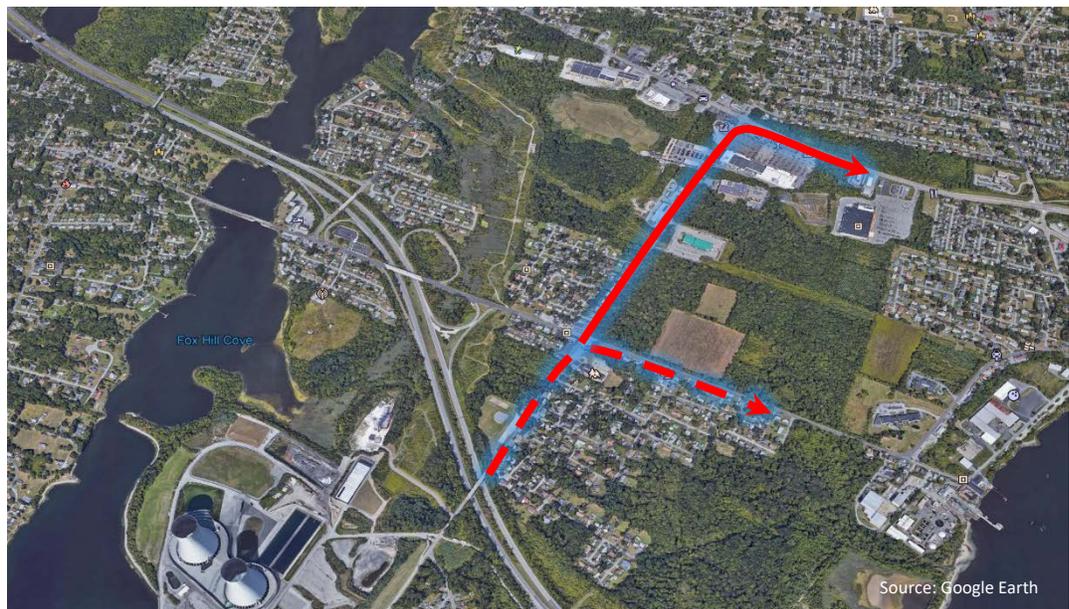
Recommendation #1 – Implement signal timing adjustments to Route 103/Brayton Point Road Intersection.

- Add all-red clearance time and optimize signal timing and phasing



Recommendation #2 – Implement truck turn restrictions to Route 103/Brayton Point Road Intersection.

- Consider detouring tractor trailers straight on to Brayton Pt up to Rt 6 and down to Lee's River Ave to get on the 195 with a safe right turn. Or straight up Brayton Pt and then ravel to their respective locations avoiding the use of the Wilbur/Brayton intersections for turns.



Recommendation #3 – Remove traffic signal and implement all-way STOP control at Route 103/Brayton Point Road Intersection.

- Evaluate feasibility of 4 way stop complete stop light at Wilbur and Brayton Pt would go a long way with red light running. Consider the success at the intersection of Bark Street and Buffinton.



Recommendation #4 – Upgrade Route 103/Lees River Avenue with a new traffic signal or a roundabout

- Address operational issues by upgrading the traffic signal or installing a roundabout.



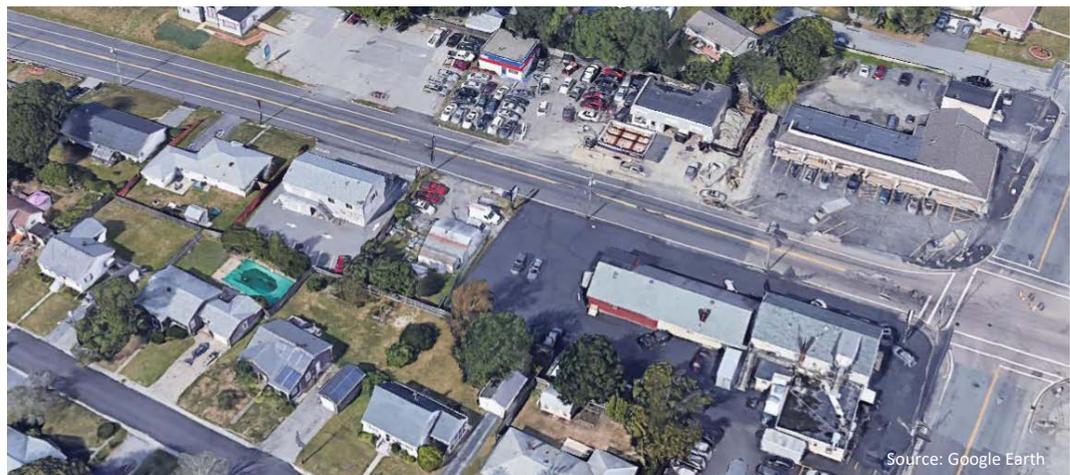
Recommendation #5 – Upgrade Route 103 corridor with on-road bicycle lanes

- Provide a 5 foot bike lane in each direction to address the need for east-west bike mobility as an alternative to Route 6.



Recommendation #6 – Route 103 Corridor access management plan with driveway consolidation and/or reduction

- Reduce the number and width of curb cuts on Route 103 as feasible



Recommendation #7 – Upgrade the roadway surface along Brayton Point Road

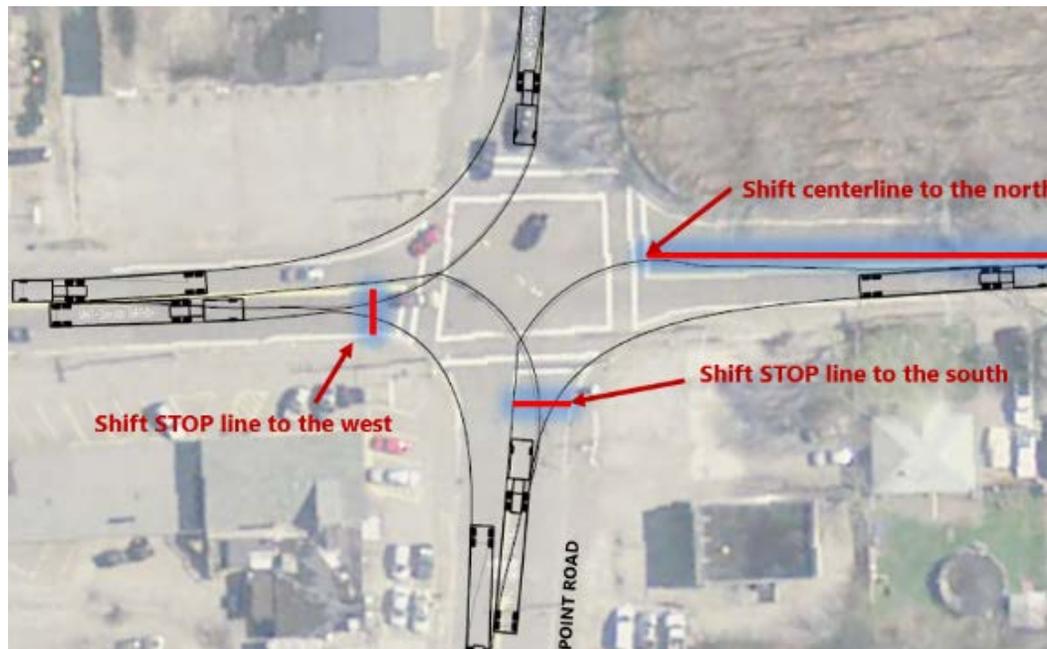
- Address pavement deterioration and prioritize the roadway segment from I-195 bridge to the former power plant as this is the most degraded section



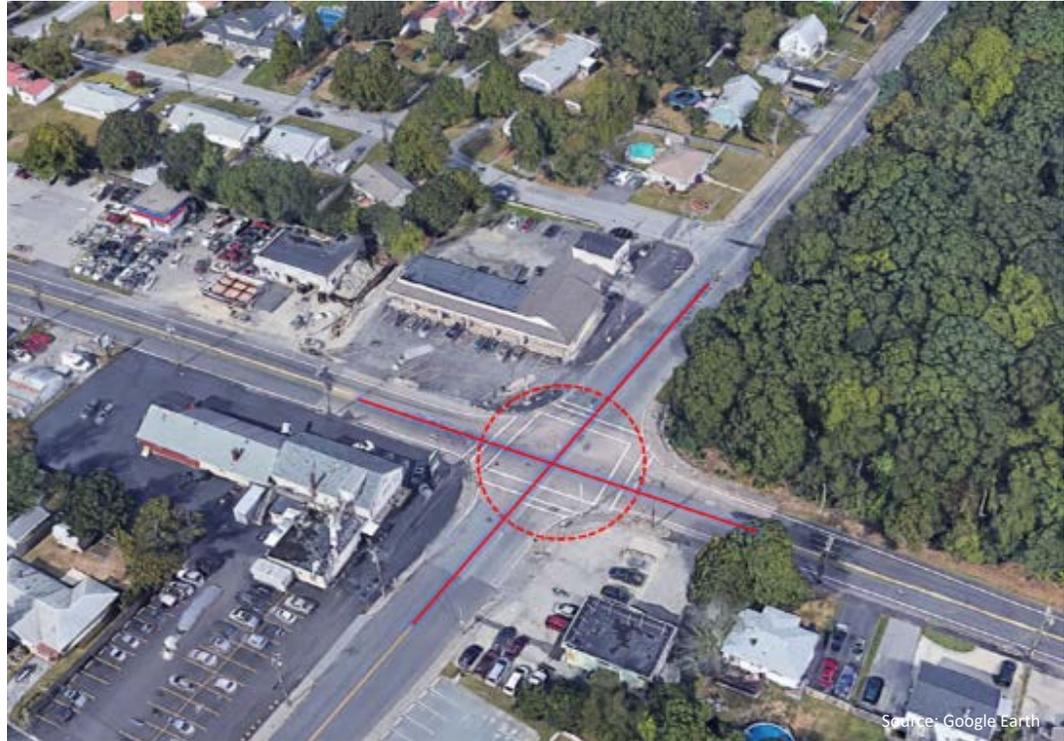
Recommendation #8 – Implement truck turn improvements or consider a truck bypass to mitigate truck turning difficulties at Route 103/Brayton Point Road

- Stop line and centerline shifts; roundabout; exclusive turning lanes; bypass road

8A – Centerline and STOP line shifts



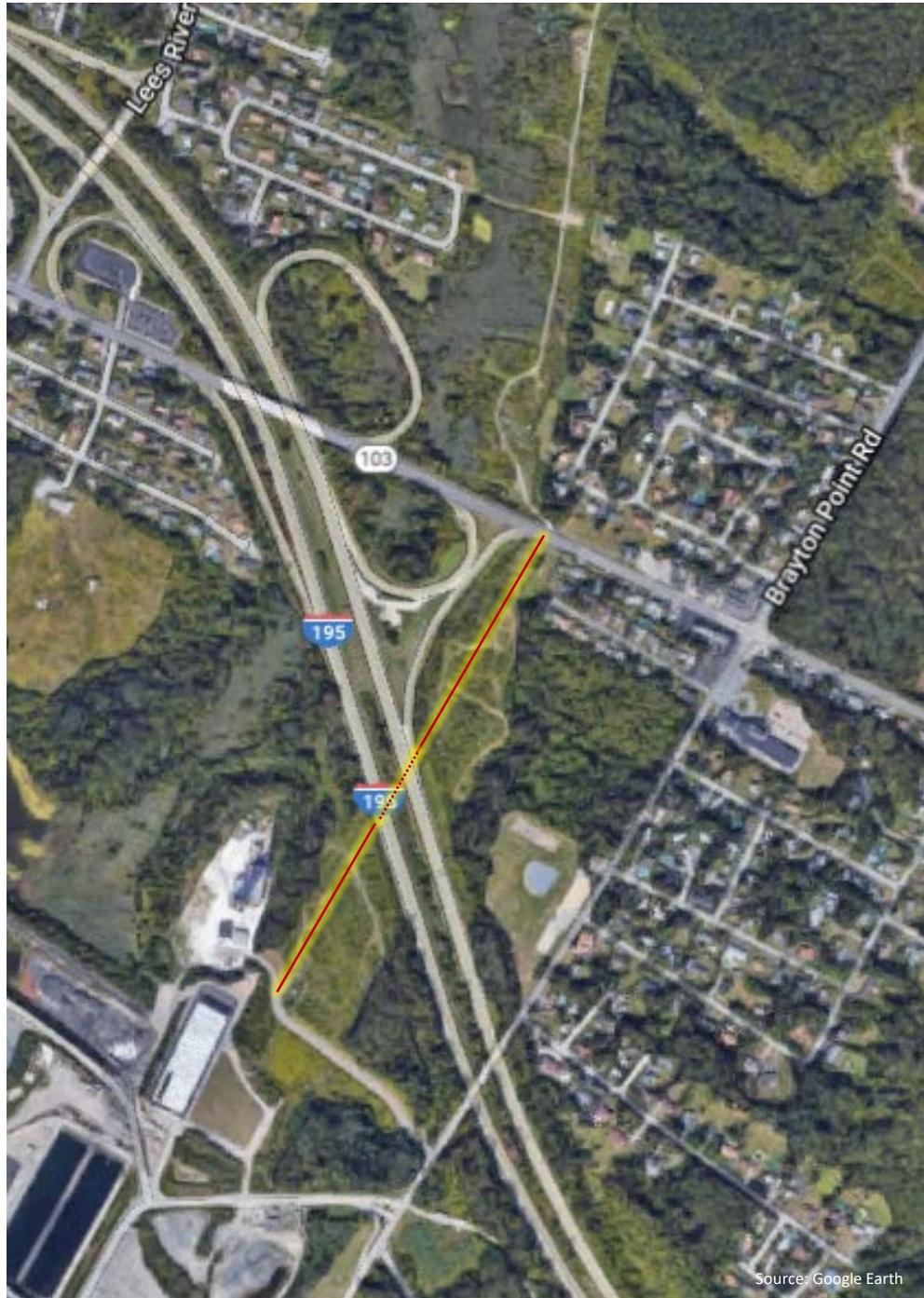
8B – Install a roundabout



8C – Install exclusive turning lanes



**8D – Construct a
bypass road to
divert truck
traffic**



Recommendation #9 – Install centerline rumble strips or paddles along Route 103 to discourage U-turns

- Low cost, high impact from safety perspective however they are high noise generators and add maintenance requirements



Recommendation #10 – Safety Improvement (Weave Elimination) - remove underutilized on-ramp to I-195 WB from Route 103 EB

- Ramp handles very low volume of traffic



Recommendation #11 – Safety Improvement (Merge Elimination) - consider roundabout (or signal) at off-ramp from I-195 WB to Route 103

- Addresses weave and high crash location on the Route 103 bridge westbound



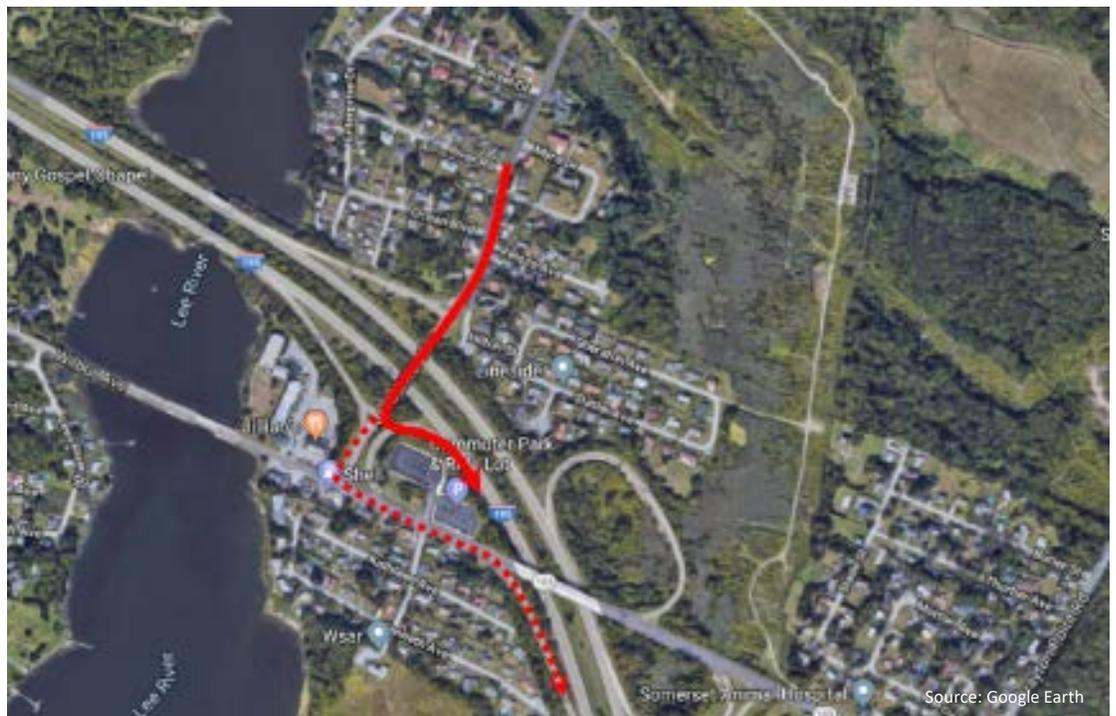
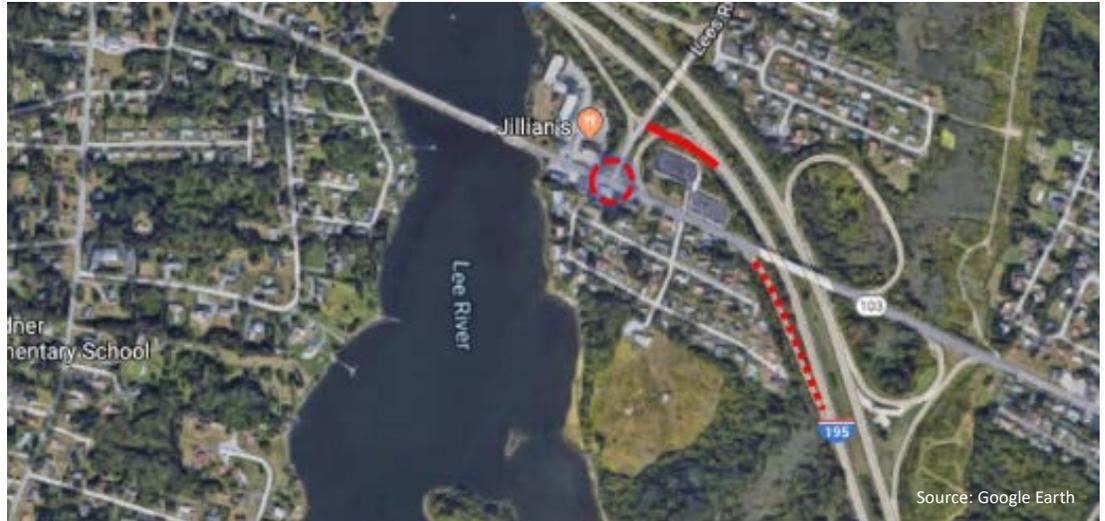
Recommendation #12 – Safety Improvement (Weave Elimination) - remove off-ramp from I-195 WB to Route 103 WB and add signal (or roundabout) at remaining I-195 WB off-ramp

- Addresses weave and high crash location on the Route 103 bridge westbound



Recommendation #13 – Safety Improvement (Weave Elimination) - Modify loop ramp onto I-195 EB from Route 103 WB

- Addresses congestion at Lees River Avenue and improves safety on I-195 EB



Recommendation #14 – Construct new off-ramp and on-ramp at Brayton Point Road along I-195 WB

- Long-term project requiring federal and state approvals; major infrastructure project with potential environmental impacts



Recommendation #15 – Consolidate ramp movements along I-195 WB with construction of a service road

- Long-term project requiring federal and state approvals; major infrastructure project with potential environmental impacts



Recommendation #16 – Conduct Road Safety Assessment (RSA) along Route 103 Corridor

- Focus on high crash locations



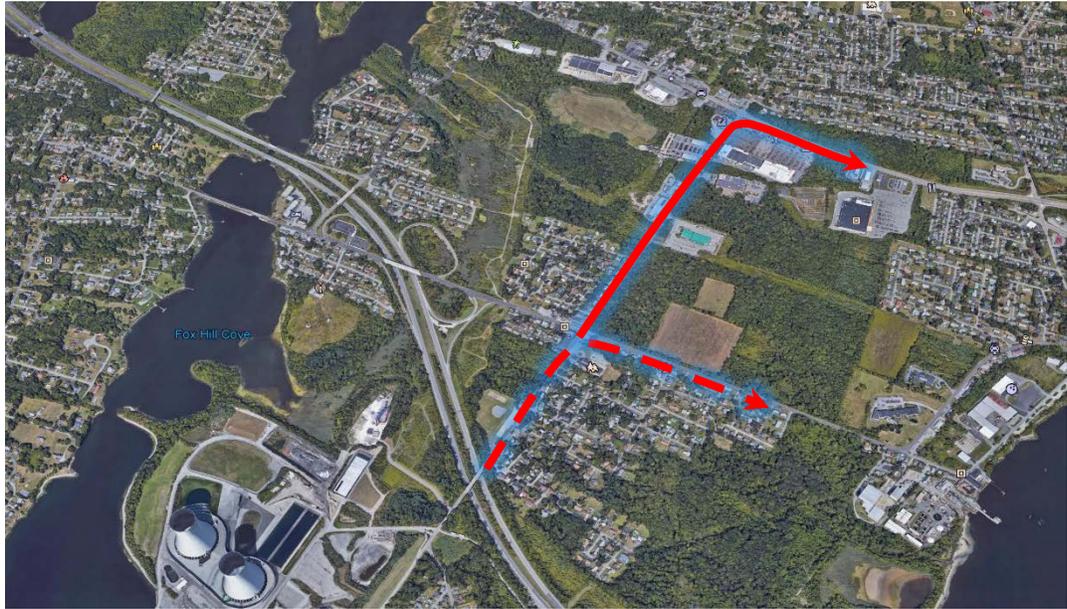
4.1 Screening and Analysis of Conceptual Improvements

The recommendations presented in this chapter were assessed using the evaluation criteria developed for the study (addressing inefficient travel patterns, improve highway access, and improve safety) and identifying any potential fatal flaws. This section presents the screening analysis for the alternatives considered.

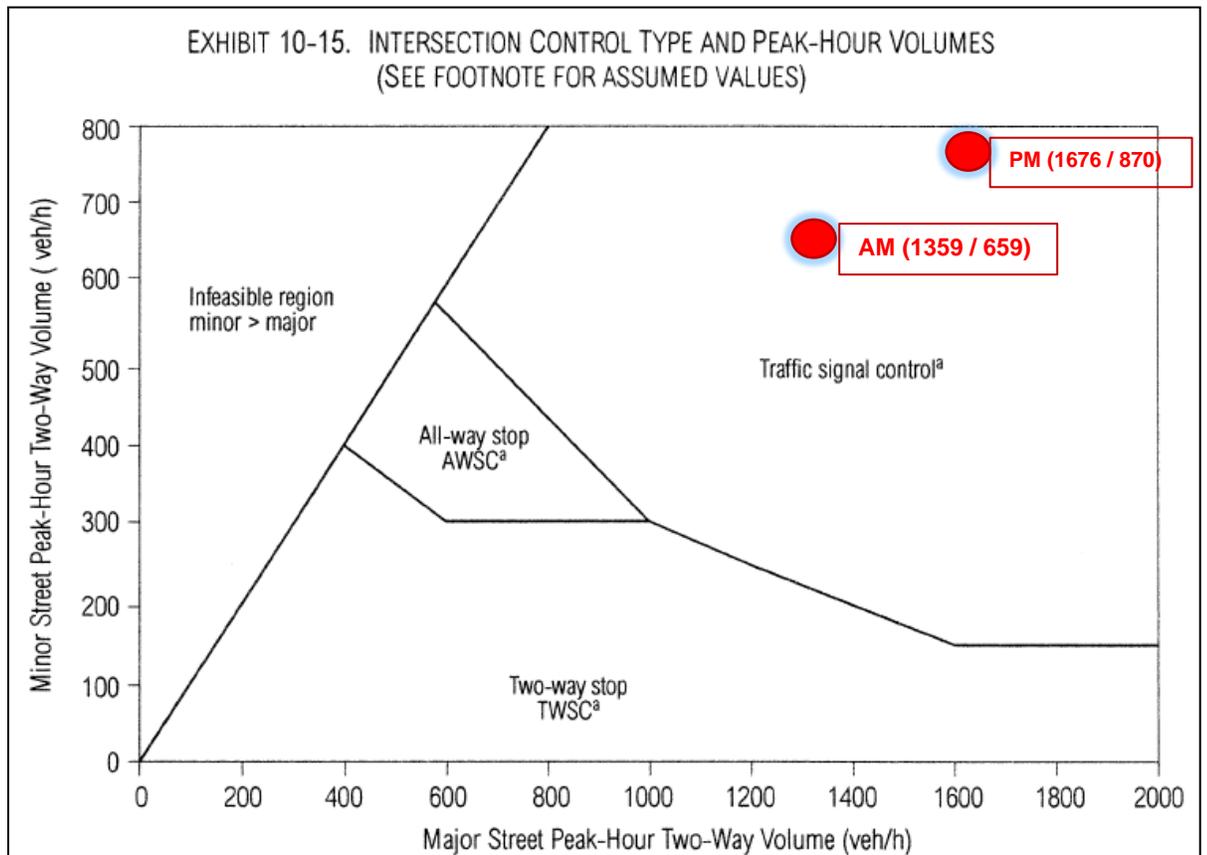
Recommendation #	Candidate Improvement	Recommendation
1	Route 103/Brayton Point Road - Added signal all-red clearance time	Recommended for short-term implementation (under 2 years).
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
2	Route 103/Brayton Point Road - Truck turn restrictions	<p>Not recommended due to difficulty of enforcement.</p> <p>The restriction would divert all trucks to Route 6 but limit access to areas that would require truck access and service creating circuitous routing and hardships on business owners.</p>
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
3	Route 103/Brayton Point Road - 4-way STOP control	Not recommended based on traffic evaluation. Traffic volumes are too high.
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	

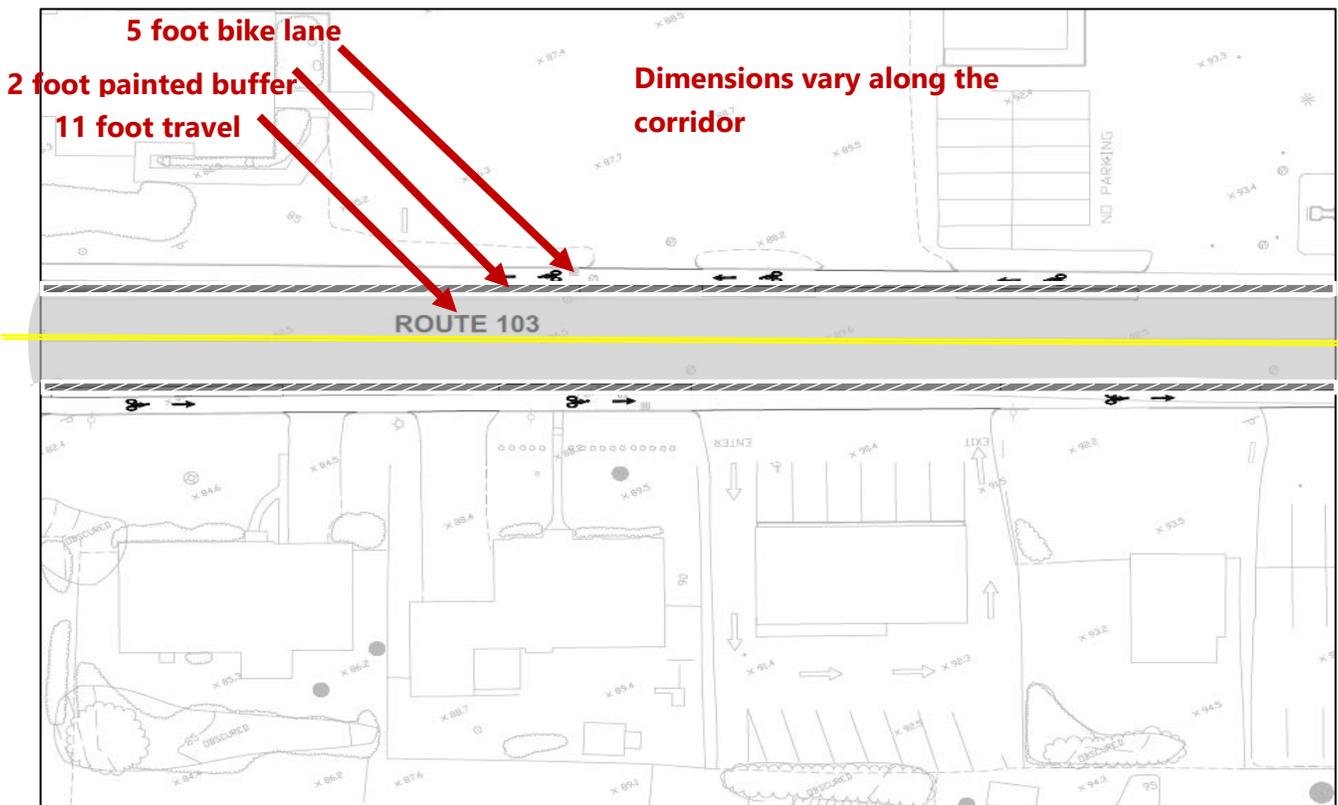


Recommendation #	Candidate Improvement	Recommendation
4	Route 103/Lees River Avenue - Intersection upgrade with new traffic signal equipment	<p>Recommended for mid-term implementation (under 5 years).</p> <p>Signal is under State jurisdiction.</p> <p>Upgrades require MassDOT coordination.</p>
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
✓	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
5	Route 103 - Corridor restriping with bike lanes. Refer to Figure 4.1 and 4.2.	<p>Recommended for mid-term implementation (under 5 years).</p> <p>Provide 5 foot buffered bike lane in each direction.</p> <p>Addresses need for east-west bike mobility as an alternate to Route 6.</p> <p>The corridor is under State jurisdiction. Upgrades require MassDOT coordination.</p> <p>Consider collaboration with SRPEDD for further evaluation with corridor-wide plan.</p>
<i>Evaluation Criteria</i>		
✓	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	

Refer to Figures 4.1 and 4.2 for details.

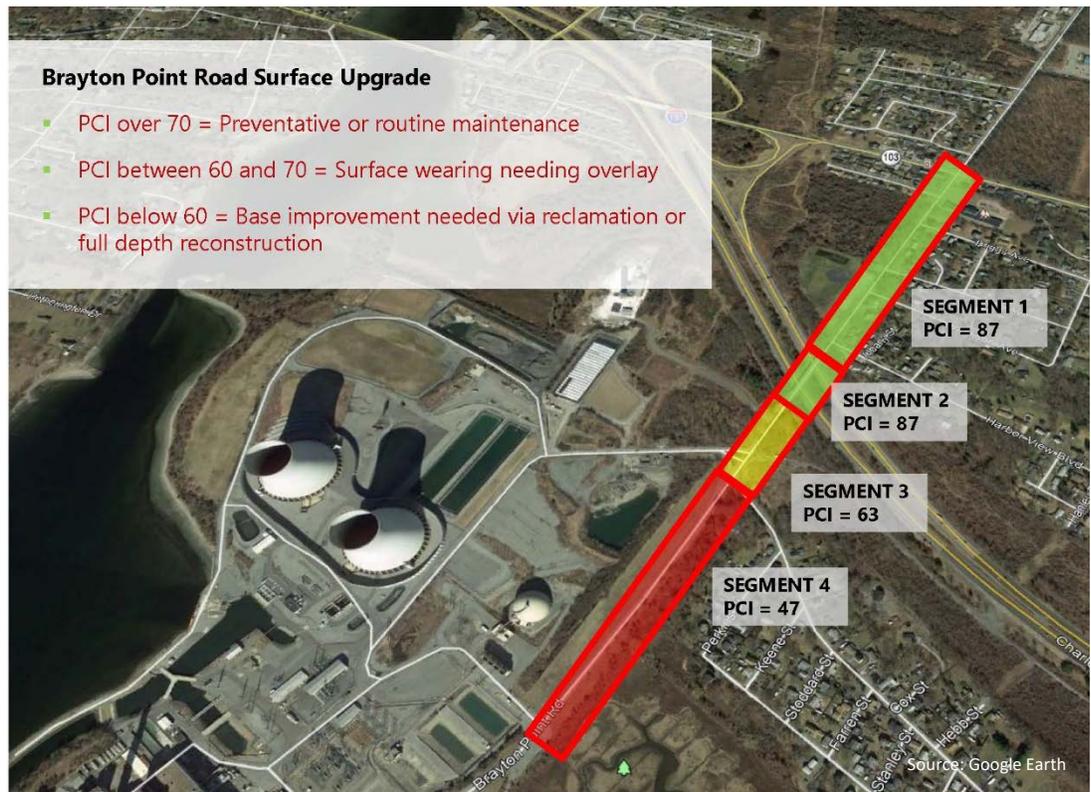


Recommendation #	Candidate Improvement	Recommendation
6	Route 103 - Corridor access management plan. Refer to Figure 4.1 and 4.2.	<p>Recommended for near-term evaluation for plan preparation (under 2 years) and mid-term implementation (under 5 years).</p> <p>Consolidate the number and width of driveways where possible.</p> <p>The corridor is under State jurisdiction. Upgrades require MassDOT coordination.</p> <p>Consider collaboration with SRPEDD for further evaluation with corridor-wide plan.</p>
<i>Evaluation Criteria</i>		
✓	Recommendation addresses inefficient travel patterns	
✓	Recommendation improves highway access	
✓	Recommendation improves safety	

Refer to Figures 4.1 and 4.2 for details.



Recommendation #	Candidate Improvement	Recommendation
7	Roadway surface upgrade - Brayton Point Road	Recommended for mid-term implementation (under 5 years). Addresses pavement deterioration. Prioritize the segment from I-195 bridge to Brayton Point Commerce Center once construction activity has diminished.
<i>Evaluation Criteria</i>		
		Recommendation addresses inefficient travel patterns
		Recommendation improves highway access
✓		Recommendation improves safety

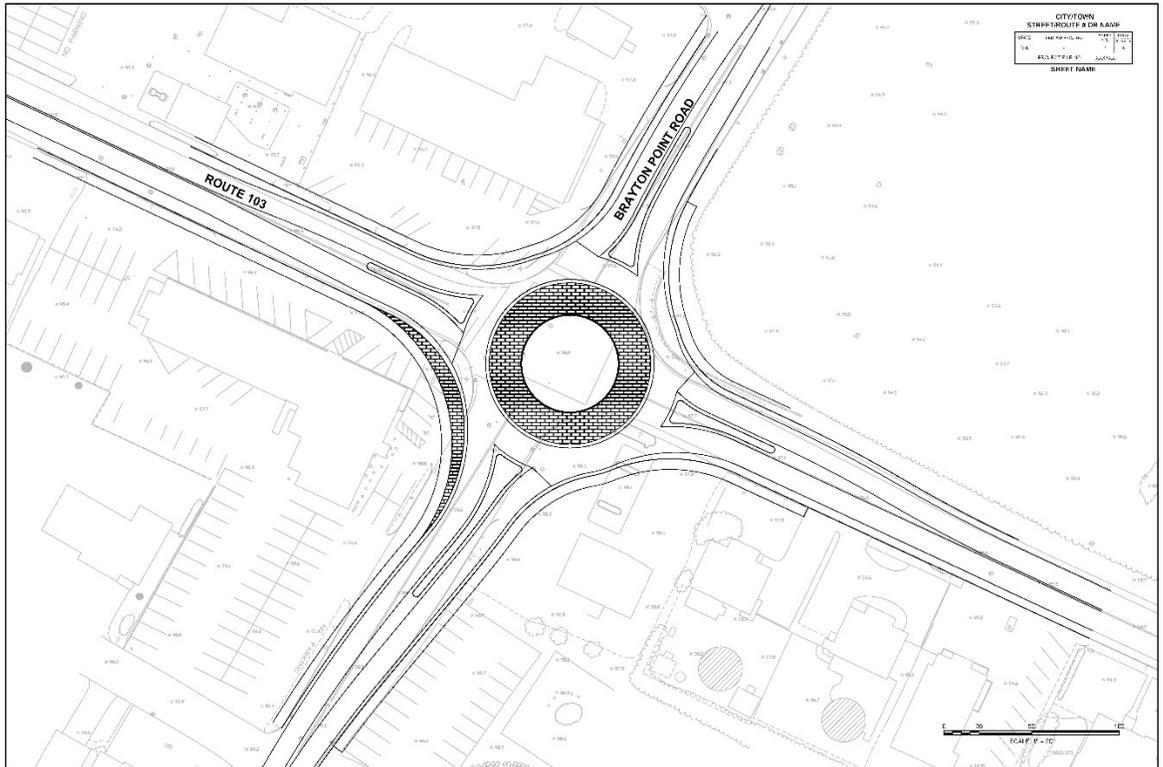


Recommendation #	Candidate Improvement	Recommendation
8	Route 103/Brayton Point Road - Truck turn improvements	<p>Recommended for short-term evaluation for plan preparation (under 2 years) and mid-term implementation (under 5 years).</p> <p>Options considered include:</p> <p>8A – Stop line and centerline shift (short-term);</p> <p>8B – Construct a roundabout (mid-term);</p> <p>8C – Rebuild with turning lanes as alternate to 8B (mid-term);</p> <p>8D – Construct bypass road (not recommended).</p> <p>The intersection is under State jurisdiction. Upgrades require MassDOT coordination.</p> <p>Consider collaboration with SRPEDD for further evaluation with corridor-wide plan.</p>
<i>Evaluation Criteria</i>		
✓	Recommendation addresses inefficient travel patterns	
✓	Recommendation improves highway access	
✓	Recommendation improves safety	

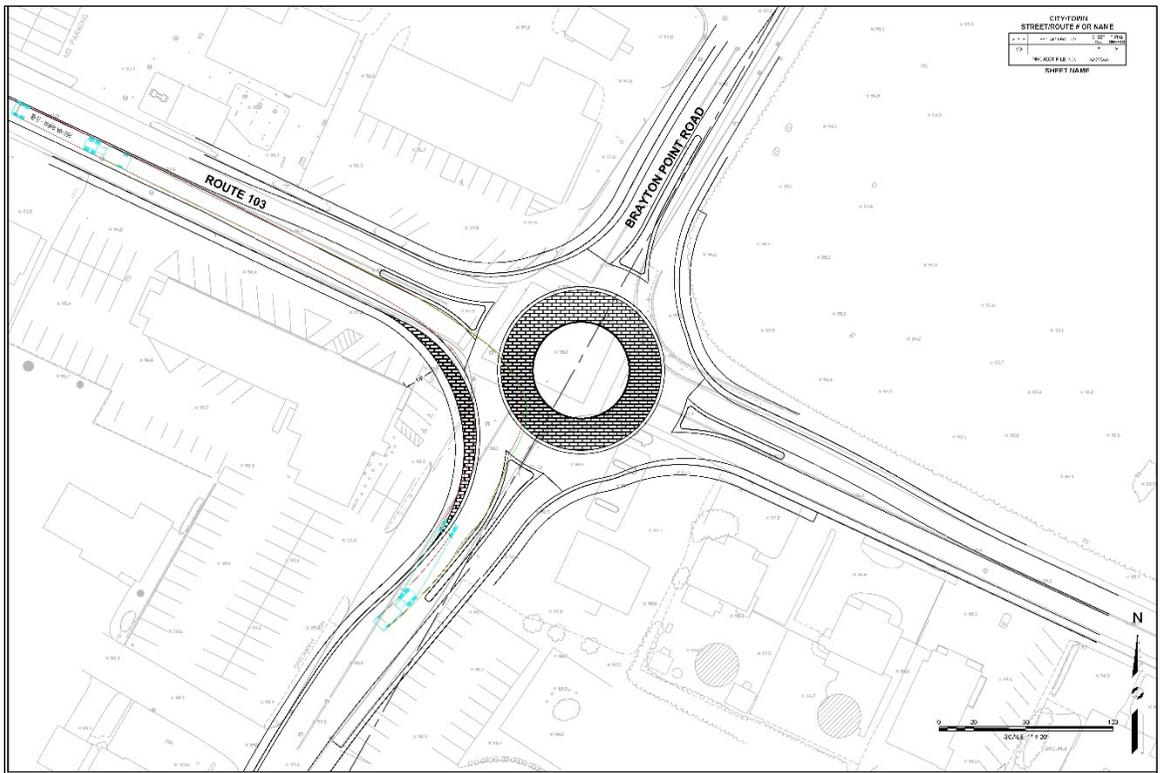
8A – Stopline and Centerline shifts



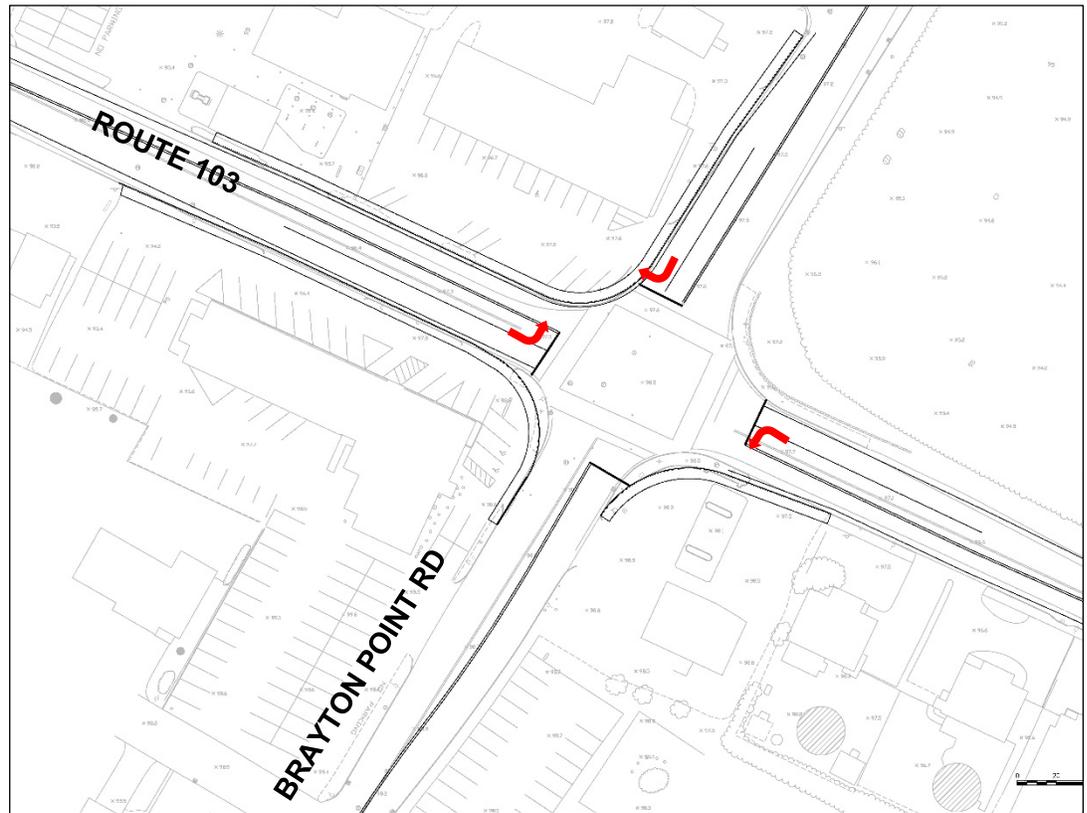
8B – Install a roundabout (Option 1 – centered)



8B – Install a roundabout (Option 2 – offset)



**8C – Install
exclusive turning
lanes**



**8D – Construct
bypass road (not
recommended)**



Recommendation #	Candidate Improvement	Recommendation
9	Centerline rumble strips or paddle barrier to discourage U-turns at entrance and exit ramps	Not recommended due to increased noise in residential areas and difficulty of enforcement.
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
10	Safety Improvement (Weave Elimination) - remove underutilized on-ramp to I-195 WB from Route 103 EB	<p>Recommended for long-term evaluation (over 5 years).</p> <p>Ramp carries low volume and results in a weave on I-195 WB.</p> <p>Requires MassDOT and FHWA interchange evaluation.</p>
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	



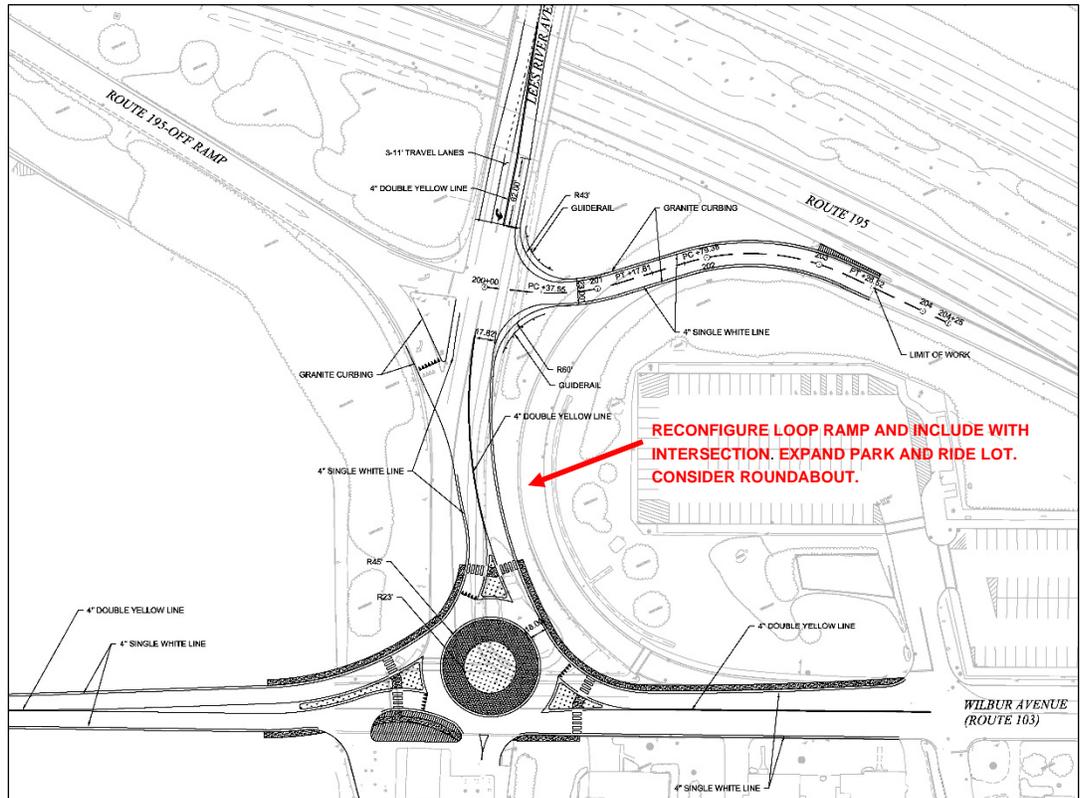
Recommendation #	Candidate Improvement	Recommendation
11	Safety Improvement (Merge Elimination) - consider roundabout (or signal) at off-ramp from I-195 WB to Route 103	<p>Recommended for long-term evaluation (over 5 years).</p> <p>Addresses safety issues, eliminates weave, and improves circulation.</p> <p>Addresses weave and high crash location on the Route 103 bridge westbound</p> <p>Requires MassDOT and FHWA interchange evaluation.</p>
<i>Evaluation Criteria</i>		
✓	Recommendation addresses inefficient travel patterns	
✓	Recommendation improves highway access	
✓	Recommendation improves safety	



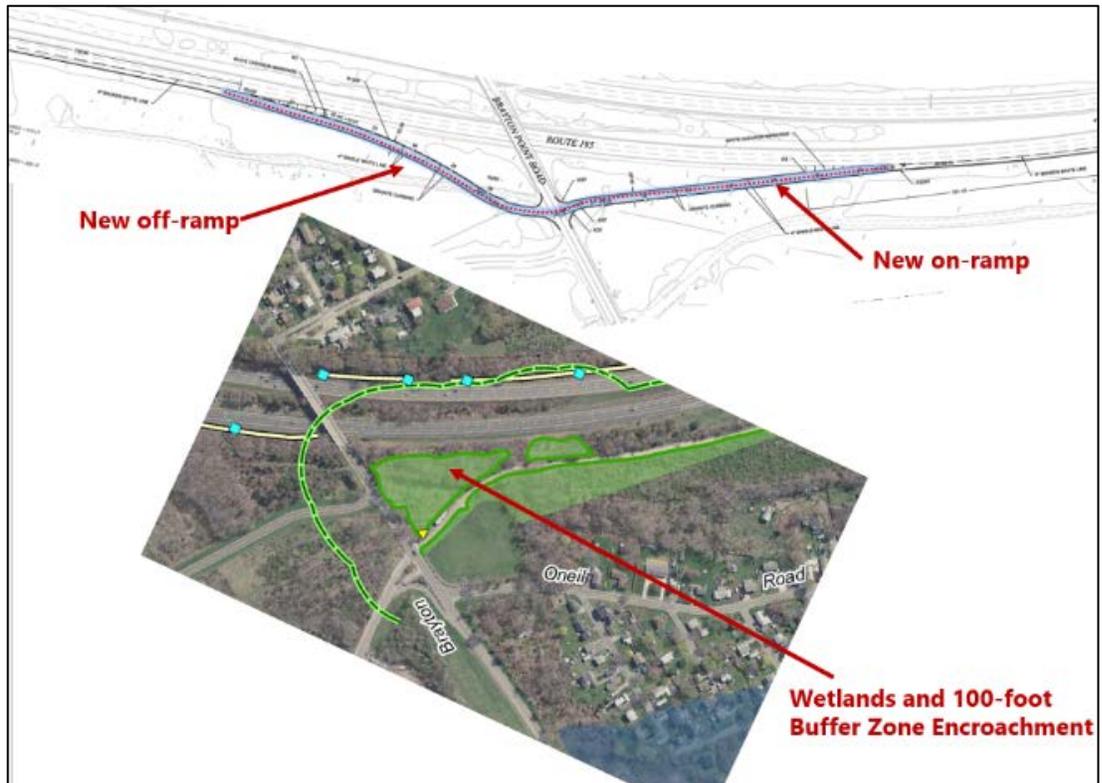
Recommendation #	Candidate Improvement	Recommendation
12	Safety Improvement (Weave Elimination) - remove off-ramp from I-195 WB to Route 103 WB and add signal (or roundabout) at remaining I-195 WB off-ramp	<p>Not recommended based on traffic evaluation.</p> <p>Due to the high traffic on the off-ramp that is removed, traffic backups could extend to the I-195 mainline from the new consolidated ramp, creating safety concerns.</p>
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
13	Modify loop ramp onto I-195 EB from Route 103 WB	<p>Recommended for long-term evaluation (over 5 years).</p> <p>Addresses safety issues and improves circulation.</p> <p>Intercepts traffic from Lees River Avenue/Route 103 intersection.</p> <p>Consider roundabout at Route 103 with an option to remove the redundant on-ramp.</p> <p>Requires MassDOT and FHWA interchange evaluation.</p>
<i>Evaluation Criteria</i>		
✓	Recommendation addresses inefficient travel patterns	
✓	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
14	Construct new off-ramp and on-ramp at Brayton Point Road along I-195 WB	<p>Recommended for further evaluation due to complexity and need to quantify the public benefit.</p> <p>Major infrastructure project with potential environmental impacts.</p> <p>Federal and State approvals required.</p> <p>Complex elements include potential wetland impacts and sufficient interchange spacing.</p> <p>Requires MassDOT and FHWA interchange evaluation.</p>
<i>Evaluation Criteria</i>		
✓	Recommendation addresses inefficient travel patterns	
✓	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
15	Consolidate ramp movements along I-195 WB with construction of a service road	<p>Not recommended due to environmental impacts, limited public benefit, and substantial cost.</p> <p>Major infrastructure project with likely environmental impacts.</p> <p>Federal and State approvals required.</p>
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
✓	Recommendation improves highway access	
✓	Recommendation improves safety	



Recommendation #	Candidate Improvement	Recommendation
16	Conduct Road Safety Assessment (RSA) along Route 103 Corridor	<p>Recommended for short-term implementation (under 2 years).</p> <p>Focus on high crash locations along the corridor.</p> <p>The corridor is under State jurisdiction. Safety evaluation require MassDOT coordination.</p> <p>Consider collaboration with SRPEDD for further evaluation with corridor-wide plan.</p>
<i>Evaluation Criteria</i>		
	Recommendation addresses inefficient travel patterns	
	Recommendation improves highway access	
✓	Recommendation improves safety	



Table 4-2 summarizes the recommendations that were discarded from further consideration and the reason why they were discarded.

Table 4-2 Summary of Discarded Options

#	Description	Reason
2	Route 103/Brayton Pt Rd: Truck turn restrictions	Enforcement would be difficult. Would divert all trucks to Route 6, but limit access to some locations that might need truck service.
3	Route 103/Brayton Pt Rd: Remove signal and implement All-Way Stop control.	Traffic volumes far too high.
9	Route 103: Centerline rumble strips or paddle barrier to discourage U-turns at entrance and exit ramps	Noise issues. Difficult enforcement and maintenance.
12	Remove off-ramp from I-195 westbound to Route 103 westbound and add signal or roundabout at remaining I-195 westbound off-ramp	Due to the high traffic on the off-ramp that is removed, traffic backups could extend to the I-195 mainline from the new consolidated ramp, creating safety concerns.
15	I-195: Construct service road to consolidate ramp movements.	High wetland and drainage impacts. Substantial cost. Federal and State agency approvals unlikely given impacts and costs.

4.2 Summary of Study Recommendations

The recommendations presented in this chapter were vetted using the evaluation criteria developed for the study and options were either recommended to be carried forward or not recommended.

Based on the screening analyses and input from the study workshops and meetings with MassDOT, the recommended study area improvements were categorized into a Recommended Action Plan. Recommended improvements are those that best address deficiencies within the study area, satisfy the evaluation criteria, and minimize environmental impacts.

The Recommended Action Plan includes varying approaches to address the existing and future transportation needs identified in this study. Each recommendation was prioritized as a short, medium, or long-term action item for implementation.

The approximate timeframe assumed for the recommendations was as follows:

- **Short-term Actions – under 2 years** – Short-term recommendations include actions that address existing safety and operational deficiencies through low cost options that can be implemented in a short timeframe, and with less effort, such as signal timing and phasing changes, signal installation, and roadway restriping.

- **Mid-term Actions – under 5 years** – Mid-term recommendations include improvements that focus on the near-term future transportation infrastructure needs, have a longer permitting and design process, and can be more costly.
- **Long-term Actions – over 5 years** – Long term recommendations include actions that will be needed to handle future roadway demands. These recommendations are capital intensive and often take longer periods of time to design, fund, permit, and construct.

Two conceptual corridor-wide plans were prepared that combine several recommendations extending from Lees River Avenue to Brayton Point Road. These plans are depicted on Figures 4.1 and 4.2.

Table 4-3 presents a summary of the screening evaluation and Table 4-4 presents the recommended action plan which categorized the recommendations into phases – short-term, mid-term, or long-term.

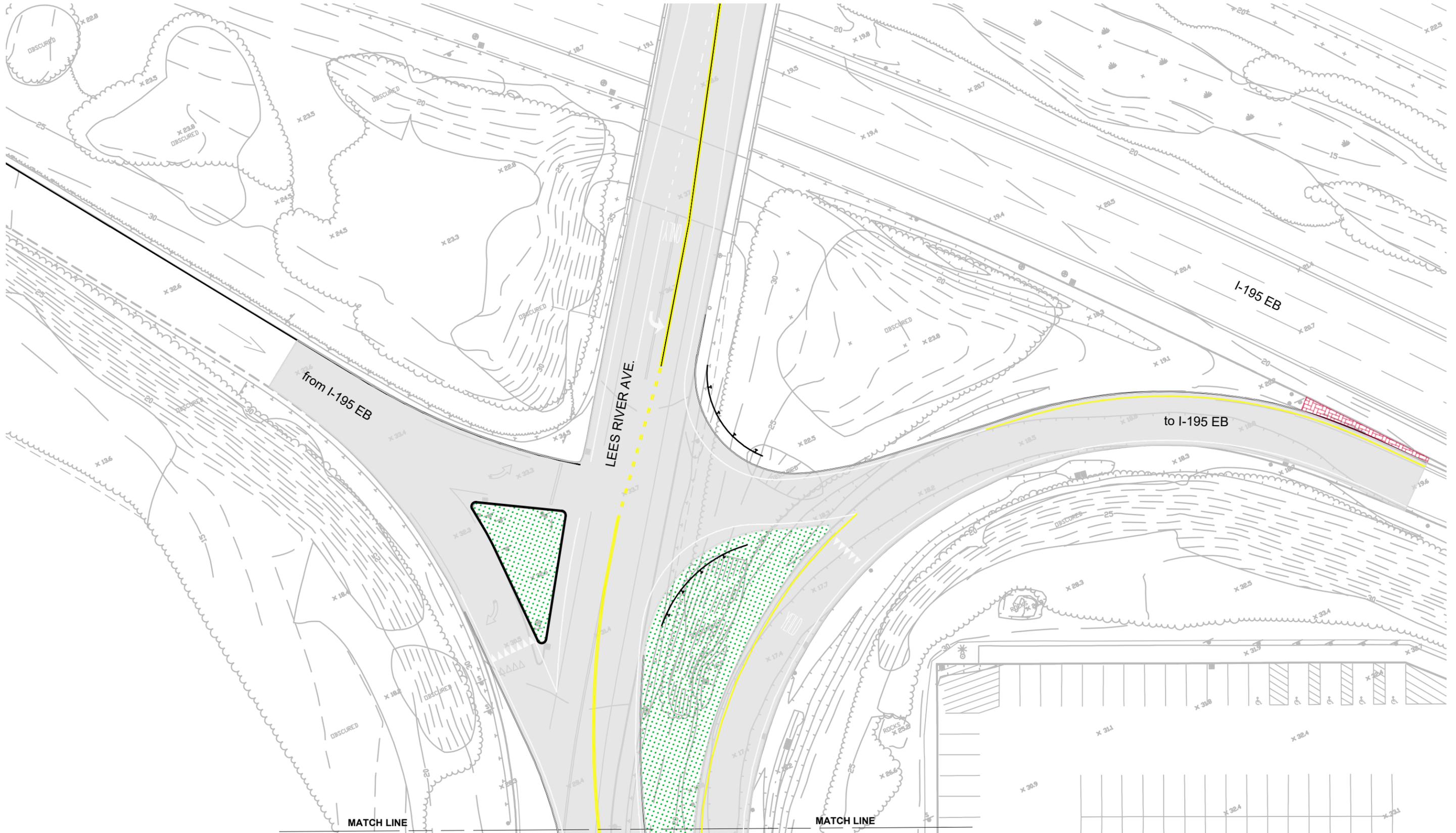


FIGURE 4.1 (SHEET 1)



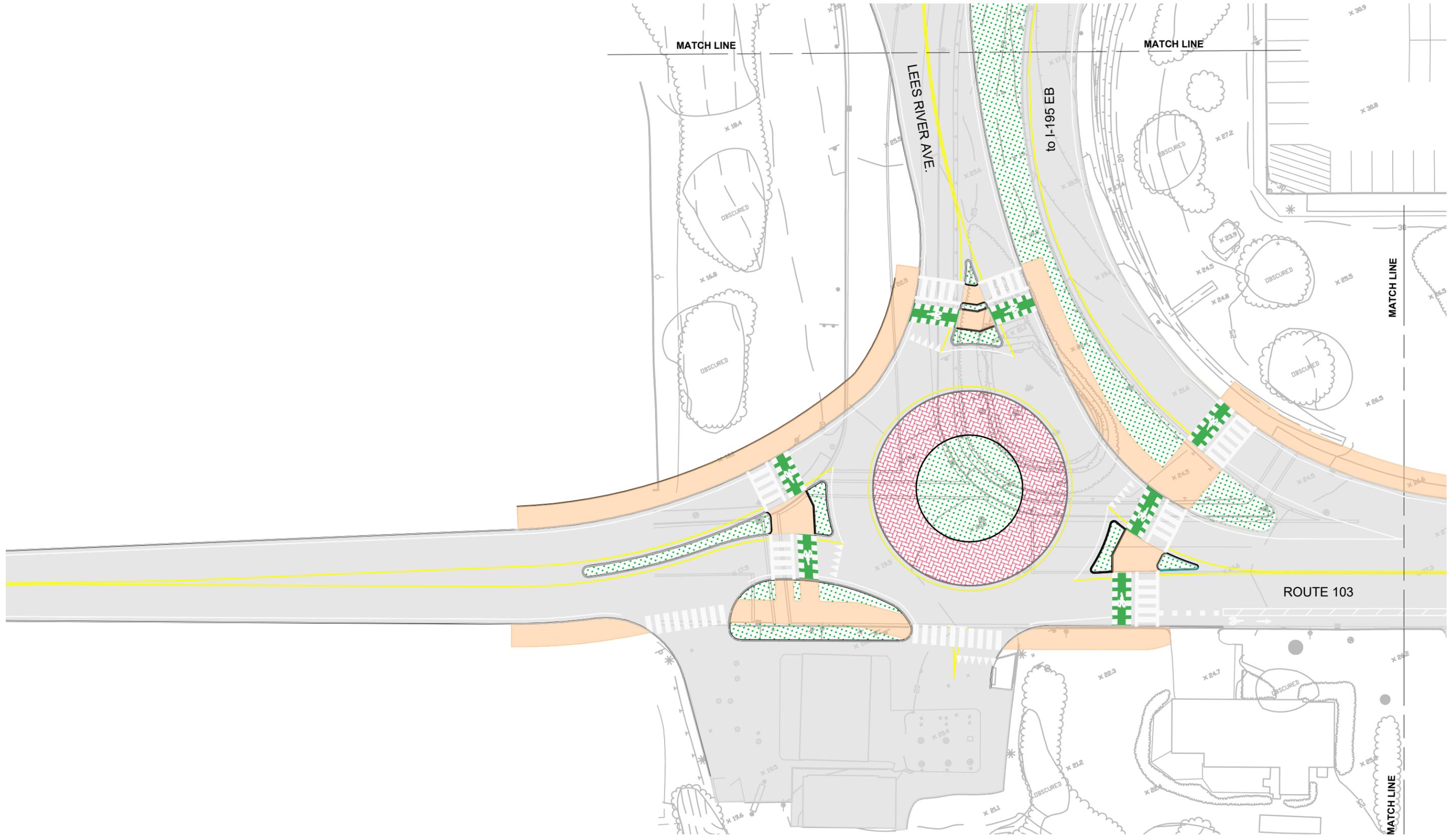


FIGURE 4.1 (SHEET 2)



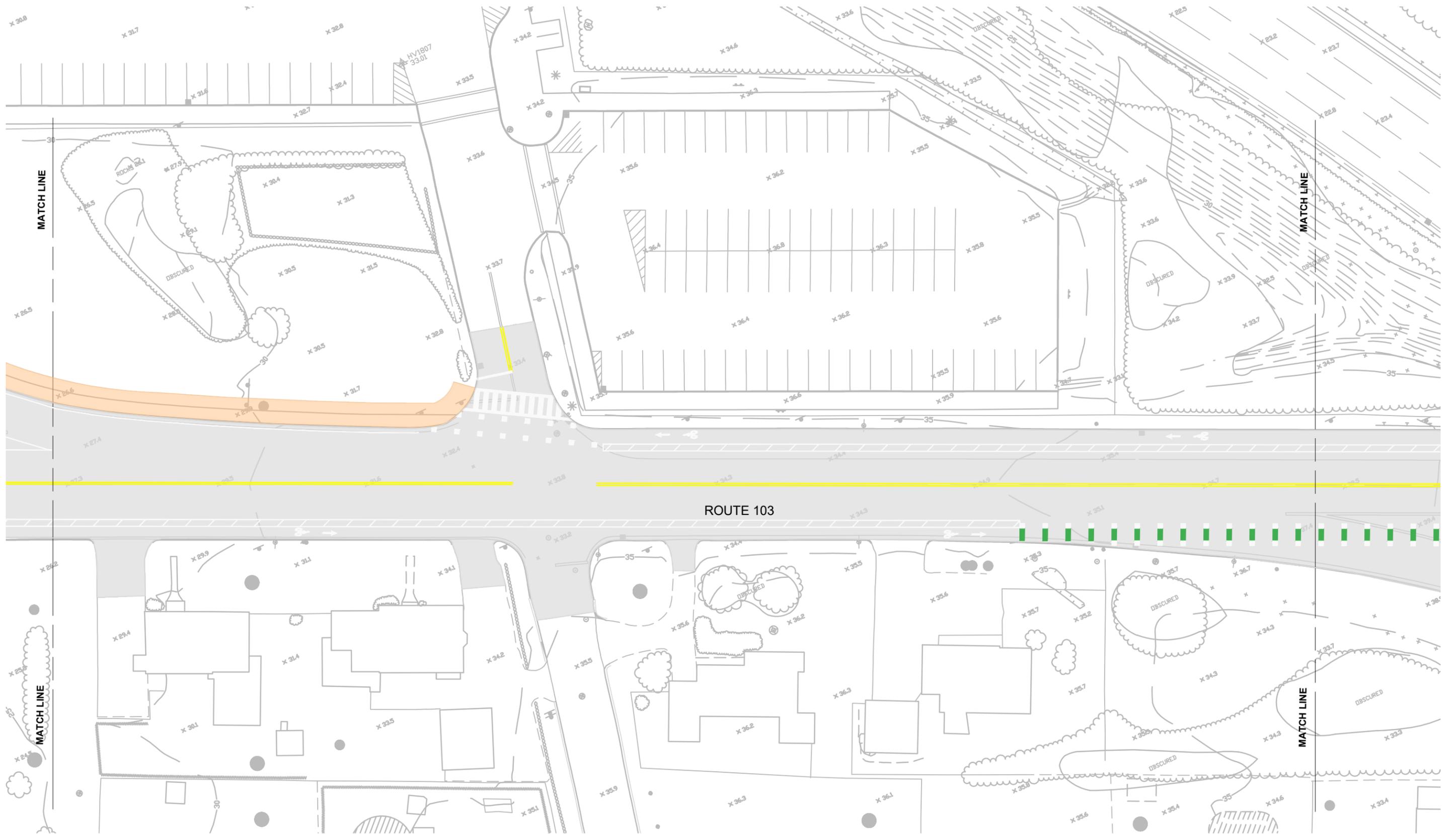
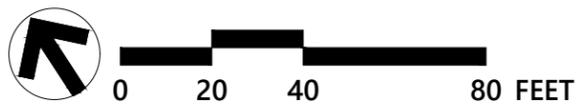


FIGURE 4.1 (SHEET 3)



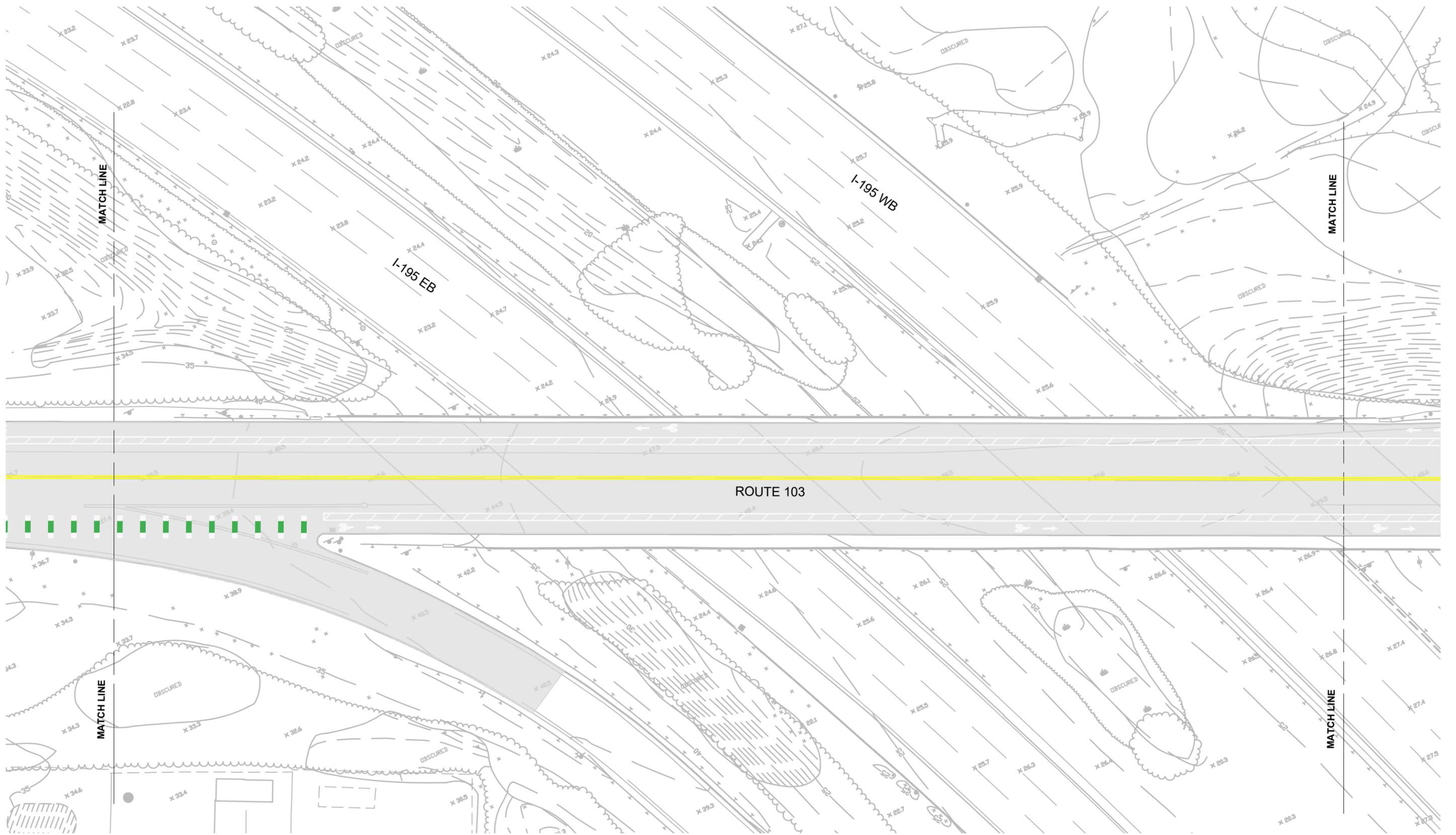
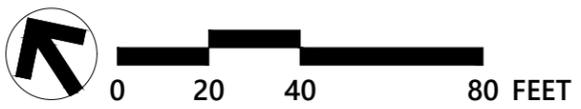


FIGURE 4.1 (SHEET 4)



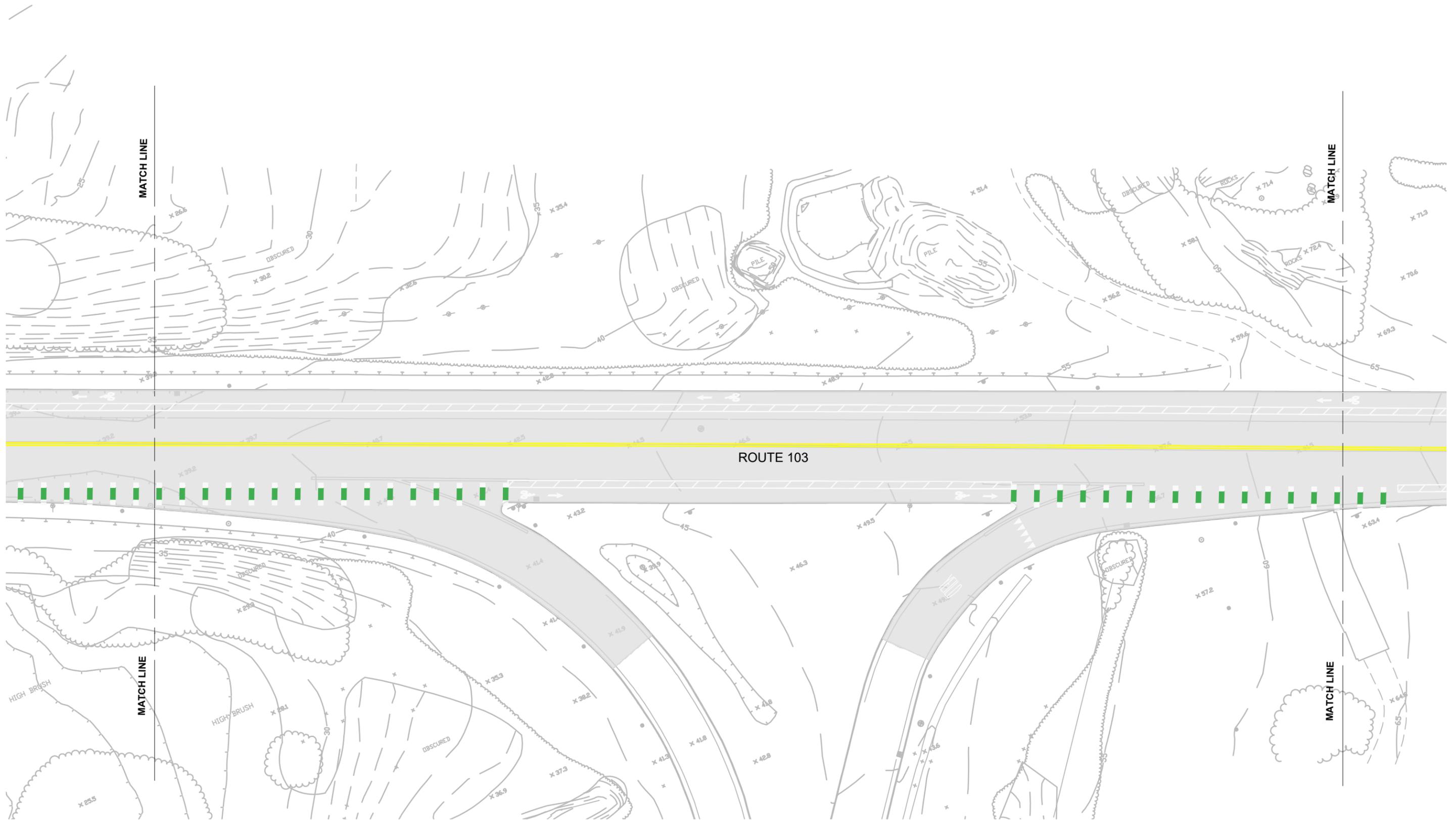
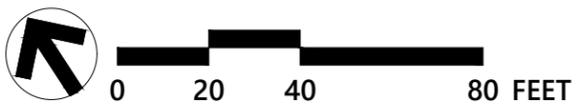


FIGURE 4.1 (SHEET 6)



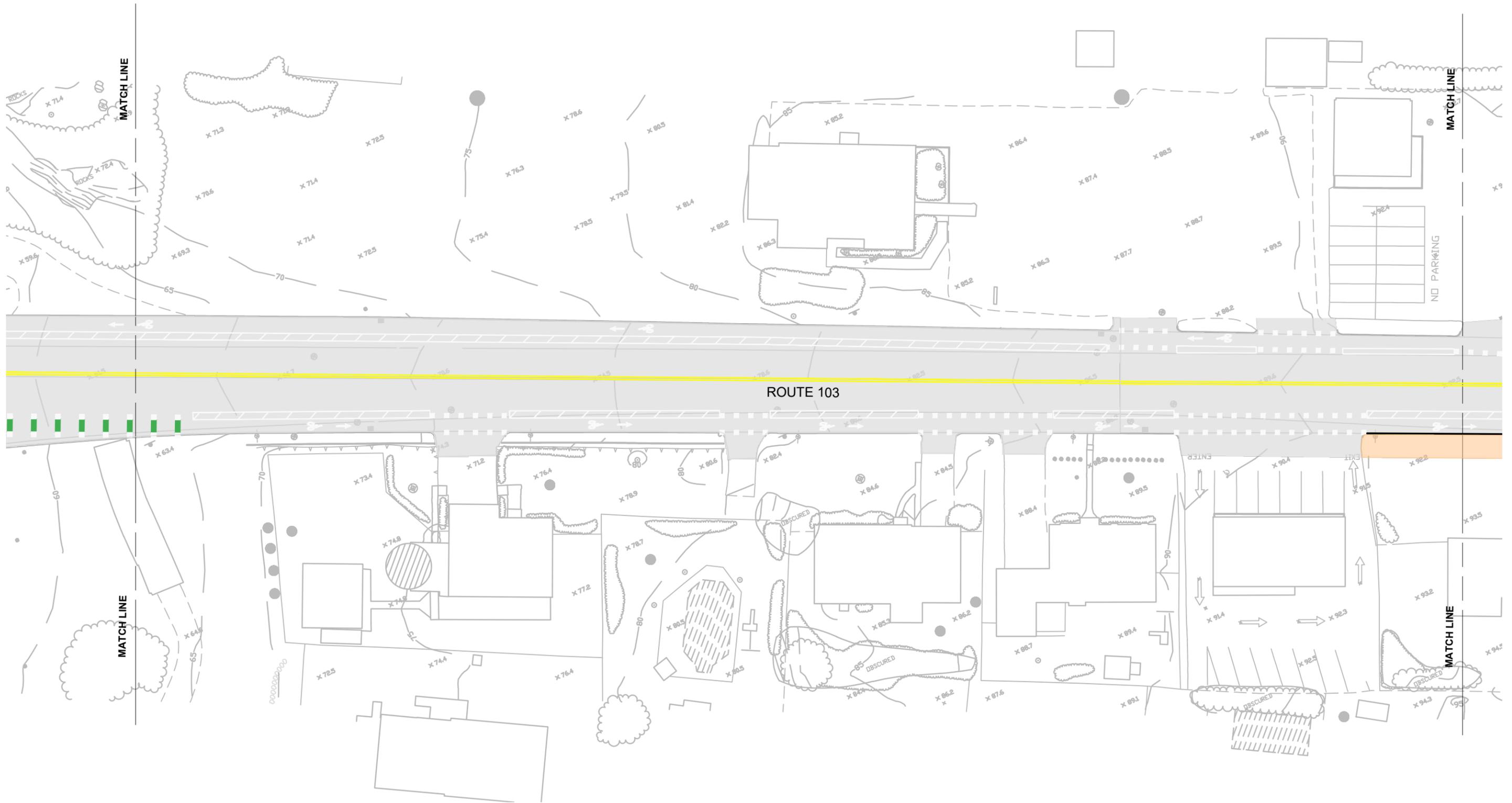
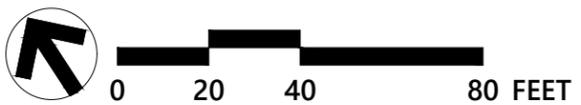


FIGURE 4.1 (SHEET 7)



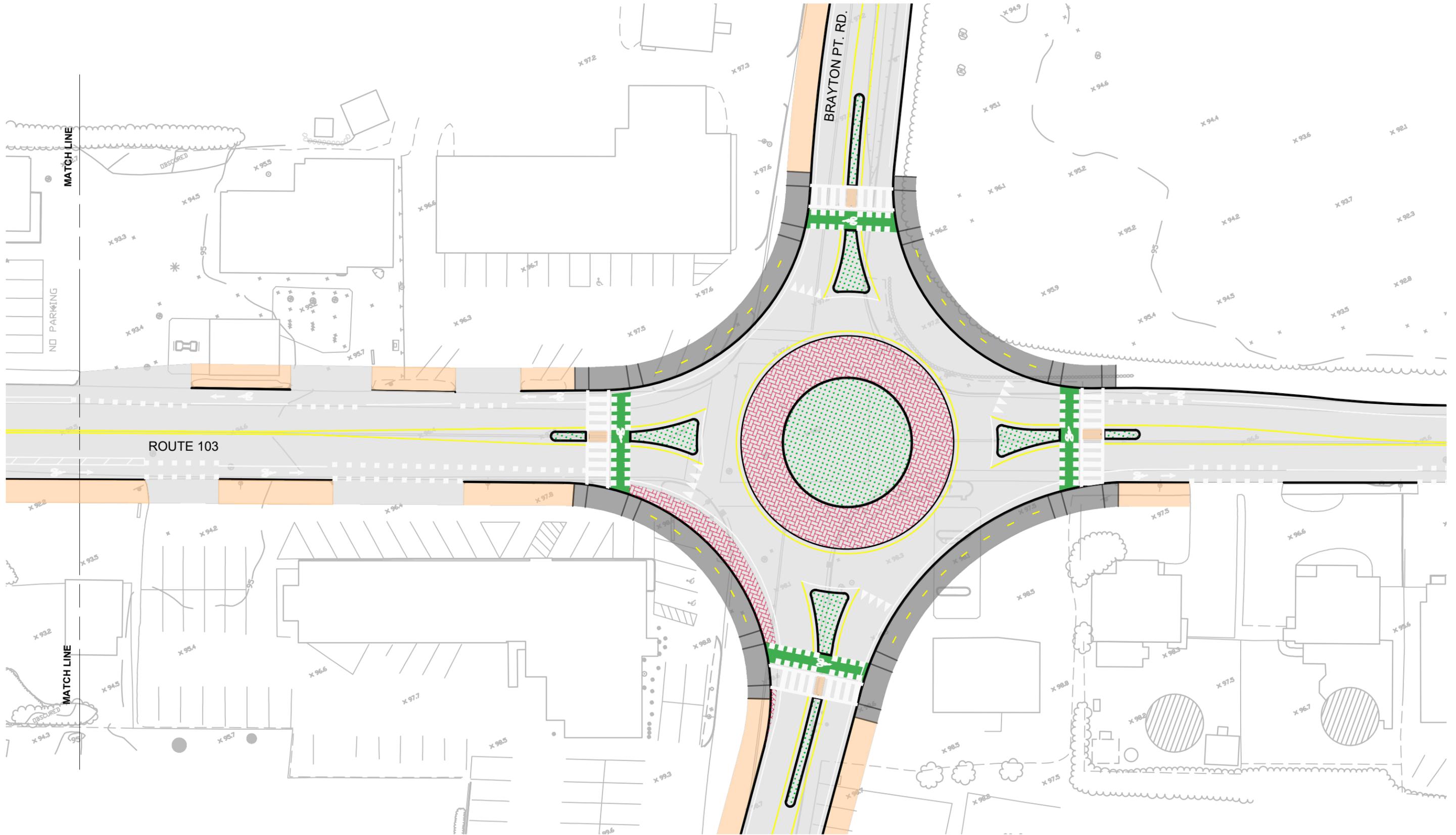
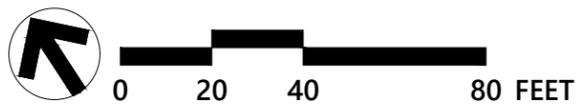


FIGURE 4.1 (SHEET 8)



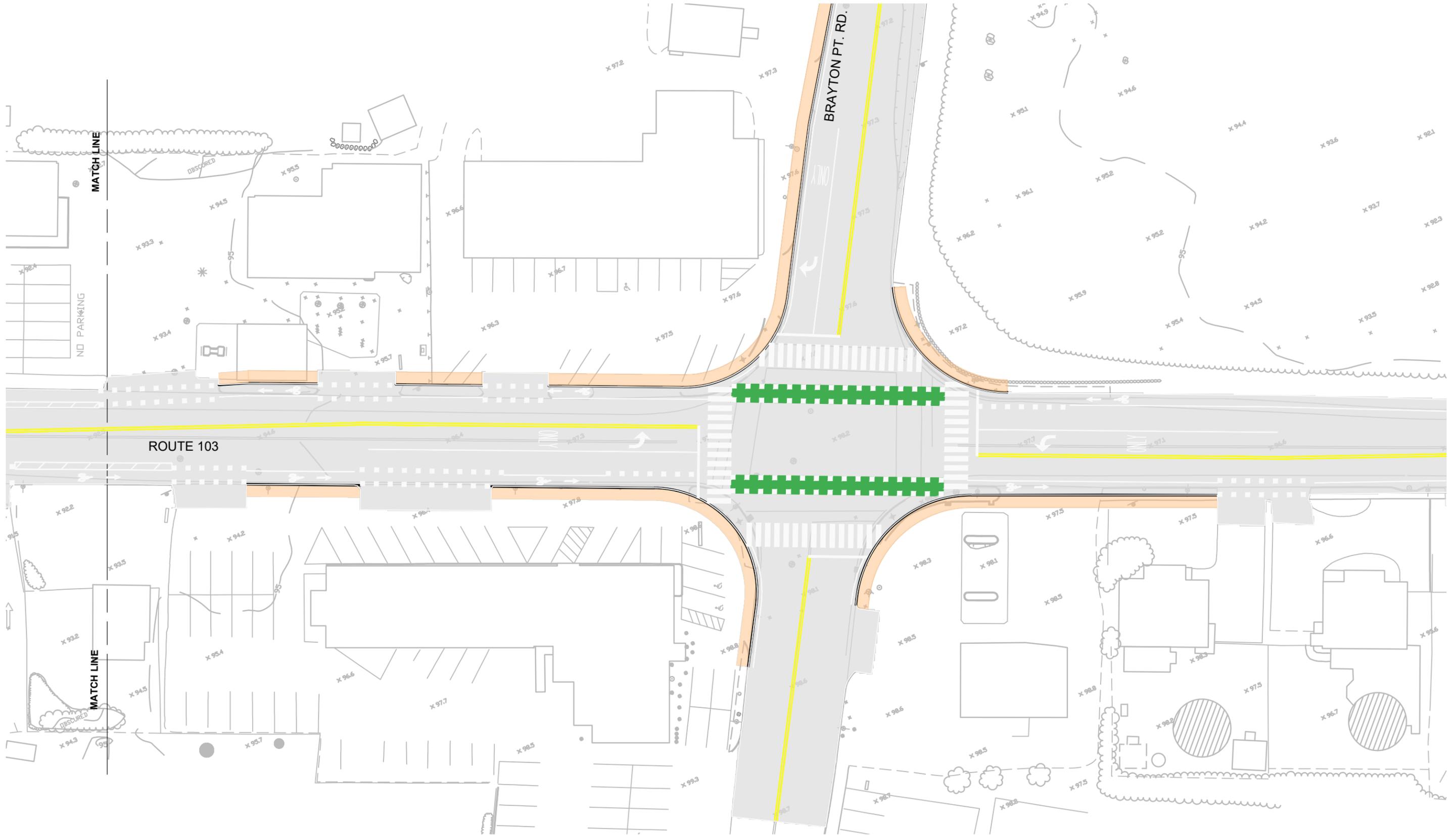


FIGURE 4.2 (Intersection)



Table 4-3 Screening of Conceptual Improvements Under Consideration

#	Candidate Improvement	Screening Recommendation	Comments
1	Route 103/Brayton Point Road - Added signal all-red clearance time	RECOMMENDATION TO CARRY FORWARD	Address red light running
2	Route 103/Brayton Point Road - Truck turn restrictions	NOT RECOMMENDED	Enforcement would be difficult. Implementation would push trucks on other less appropriate roadways.
3	Route 103/Brayton Point Road - 4-way STOP control	NOT RECOMMENDED	Traffic volumes are too high
4	Route 103/Lees River Avenue - Intersection upgrade with new traffic signal equipment	RECOMMENDATION TO CARRY FORWARD	MassDOT jurisdiction for these signals
5	Route 103 - Corridor restriping with bike lanes	RECOMMENDATION TO CARRY FORWARD	Add turn lanes at intersections as feasible. Add bike lanes where feasible/desirable
6	Route 103 - Corridor access management plan	RECOMMENDATION TO CARRY FORWARD	Reduce driveway width and number of driveways where possible
7	Roadway surface upgrade - Brayton Point Road	RECOMMENDATION TO CARRY FORWARD	Prioritize segment from I-195 bridge to former power plant and after Brayton Point Commerce Center construction activity has diminished
8	Route 103/Brayton Point Road - Truck turn improvements	RECOMMENDATION TO CARRY FORWARD	shifted stop lines and possibly turning restrictions or roundabout
9	Centerline rumble strips on Route 103 to discourage U-turns	NOT RECOMMENDED	Noise and maintenance concerns
10	Safety Improvement (Weave Elimination) - remove underutilized on-ramp to I-195 WB from Route 103 EB	RECOMMENDATION TO CARRY FORWARD	low volume, addresses safety issue
11	Safety Improvement (Merge Elimination) - consider roundabout (or signal) at off-ramp from I-195 WB to Route 103	RECOMMENDATION TO CARRY FORWARD	addresses safety issues and weave; improves circulation
12	Safety Improvement (Weave Elimination) - remove off-ramp from I-195 WB to Route 103 WB and add signal (or roundabout) at remaining I-195 WB off-ramp	NOT RECOMMENDED	long-term project requiring federal and state approvals
13	Modify loop ramp onto I-195 EB from Route 103 WB	RECOMMENDATION TO CARRY FORWARD	Consider roundabout at the base of the ramp
14	Construct new off-ramp and on-ramp at Brayton Point Road along I-195 WB	FURTHER EVALUATION REQUIRED DUE TO COMPLEXITY	Major infrastructure project with potential environmental impacts
15	Consolidate ramp movements along I-195 WB with construction of a service road	NOT RECOMMENDED	Major infrastructure project with potential environmental impacts
16	Conduct Road Safety Assessment (RSA) along Route 103 Corridor	RECOMMENDATION TO CARRY FORWARD	Focus on high crash locations

Table 4-4 Recommended Action Plan

#	Candidate Improvement	Short-term (under 2 years)	Mid-term (under 5 years)	Long-term (over 5 years)	Comments
1	Route 103/Brayton Point Road - Added signal all-red clearance time	X			Address red light running
4	Route 103/Lees River Avenue - Intersection upgrade with new traffic signal equipment		X		MassDOT jurisdiction for these signals
5	Route 103 - Corridor restriping with bike lanes		X		Add turn lanes at intersections as feasible. Add bike lanes where feasible/desirable
6	Route 103 - Corridor access management plan	X	X		Reduce driveway width and number of driveways where possible; prepare plan in near-term and implement in mid-term
7	Roadway surface upgrade - Brayton Point Road		X		Prioritize segment from I-195 bridge to former power plant and after Brayton Point Commerce Center construction activity has diminished
8	Route 103/Brayton Point Road - Truck turn improvements	X	X		Shifted stop lines and centerline as near term action; roundabout or turning lanes as mid-term action
10	Safety Improvement (Weave Elimination) - remove underutilized on-ramp to I-195 WB from Route 103 EB			X	Low volume, addresses safety issue FHWA Interstate Access Policy review needed
11	Safety Improvement (Merge Elimination) - consider roundabout (or signal) at off-ramp from I-195 WB to Route 103			X	Addresses safety issues and weave; improves circulation FHWA Interstate Access Policy review needed
13	Modify loop ramp onto I-195 EB from Route 103 WB			X	Consider roundabout at the base of the ramp FHWA Interstate Access Policy review needed
14	Construct new off-ramp and on-ramp at Brayton Point Road along I-195 WB			X	Major infrastructure project with potential environmental impacts FHWA Interstate Access Policy review needed
16	Conduct Road Safety Assessment (RSA) along Route 103 Corridor	X			Focus on high crash locations; early action item through MassDOT

The recommendations that involve Interstate access requests (Options 10, 11, 13, and 14) would require an evaluation of the changes based on FHWA's Interstate Access Policy (https://www.fhwa.dot.gov/modiv/programs/intersta/docs/FHWA_Policy_Points_Promptlist.pdf) which includes several criteria:

- › **Policy Point 1:** The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in

the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands.

- › **Policy Point 2:** The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access.
- › **Policy Point 3:** An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections.
- › **Policy Point 4:** The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots.
- › **Policy Point 5:** The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process.
- › **Policy Point 6:** In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan.
- › **Policy Point 7:** When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements. The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point.
- › **Policy Point 8:** The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing.

4.3 Pavement Assessment Recommendation

Based on public comments about the deteriorated pavement conditions on Brayton Point Road, a visual condition assessment was performed along the roadway extending from

Route 103 to the gated entrance of the former Brayton Point power plant (now called the Brayton Point Commerce Center).

Brayton Point Road was divided into four segments based on the pavement condition:

- › **Segment 1** – From Wilbur Avenue (Route 103) to the north end of the bridge over Interstate 195. Pavement Condition Index (PCI) of 87.
- › **Segment 2** – The I-195 Bridge Deck. No pavement deterioration noted.
- › **Segment 3** – From the south end of the bridge over Interstate 195 to O’Neil Road. Pavement Condition Index (PCI) of 63.
- › **Segment 4** – From O’Neil Road to the gated entrance of the Brayton Point power plant site. Pavement Condition Index (PCI) of 47.

For the current PCI of 47-63 (Segments 3 and 4 running from the bridge to the gate) and ADT of 1,600 vehicles with 3 percent heavy vehicles, **it is likely that Brayton Point Road would be found structurally inadequate**. Assuming a typical Urban Collector pavement box of 4 inches of HMA over 8 inches of silty gravel, this section would require 1.5 inch to 2.0 inches of additional HMA to meet flexible pavement design requirements for a typical 20-year design life, which is NOT recommended.

From Route 103 to the bridge (Segments 1 and 2), assuming the same typical section, the pavement is **likely adequate for current traffic levels**. For the projected increase in heavy vehicle traffic, this portion of Brayton Point Road (Segment 1 and 2) is adequate but would be expected to deteriorate more rapidly.

Segments 3 and 4 are likely inadequate and would require an overlay of 2.5 inches to 4.0 inches to meet flexible pavement design requirements for a typical 20-year design life, which is NOT recommended.

Segment 4 also exhibits very poor drainage characteristics. These issues should be addressed prior to increasing traffic volume on this section.

Recommendations

It is likely that the existing Hot Mix Asphalt (HMA) and granular subbase thicknesses are inadequate for the projected increase in heavy vehicle traffic. Given the increased heavy vehicle traffic expected on Brayton Point Road, a full pavement section analysis and design is recommended for the entire length (at a minimum from the I-195 bridge running south to the gate). This analysis would include pavement cores and test pits along the length of the road to determine existing pavement thickness, soil composition, drainage and bearing capacity.

Segment 1 is in good condition but could benefit from crack sealing along utility patch sawcuts and existing transverse and longitudinal cracking, however it will still be subject to accelerated deterioration during construction.

A “functional overlay” where additional HMA is paved over the prepared existing surface is not an option for Segments 1, 2, and 3, due to existing vertical granite curbing and driveway

cuts. These segments can only be treated by structural improvement (mill and overlay) or full depth reconstruction/reclamation, subject to the results of pavement testing and analysis.

Because it has no existing sidewalk or edge confinement, Segment 4 could normally be treated with a “functional overlay” but in this case is not recommended due to the drainage issues observed along this segment. If saturated soils exist or develop under this segment, even a robust overlay will fail quickly. Once existing granular subbase and subgrade conditions can be evaluated via pavement testing and analysis, drainage improvements including underdrains, edge confinement, basins, and or swales can be recommended. Segment 4 can only be adequately repaired by full depth reconstruction/reclamation.

Pavement preservation treatments (cracksealing, chipseal, etc.) are not recommended for Segments 3 and 4 due to the advanced level of distress visible.

5

5 Conclusions and Next Steps

This chapter provides an overview of the conclusions reached in this study and the recommended next steps for the Town of Somerset.

5.1 Conclusions

This report presented an assessment of several candidate recommendations to help solve infrastructure deficiencies such as safety and traffic flow inefficiencies. The following candidate options are recommended to be carried forward for future evaluation and consideration:

1. Route 103/Brayton Point Road - Added signal all-red clearance time & Signal Upgrade
4. Route 103/Lees River Avenue - Intersection upgrade with new traffic signal equipment or roundabout
5. Route 103 - Corridor restriping with bike lanes
6. Route 103 - Corridor access management plan with driveway consolidation and/or reduction

7. Roadway surface upgrade - Brayton Point Road
8. Route 103/Brayton Point Road - Truck turn improvements with added turning lanes or reconfigured as a roundabout
10. Safety Improvement (Weave Elimination) - remove underutilized on-ramp to I-195 WB from Route 103 EB
11. Safety Improvement (Merge Elimination) - consider roundabout (or signal) at off-ramp from I-195 WB to Route 103
13. Modify loop ramp onto I-195 EB from Route 103 WB
14. Construct new off-ramp and on-ramp at Brayton Point Road along I-195 WB
16. Conduct Road Safety Assessment (RSA) along Route 103 Corridor

5.2 Funding Opportunities

None of the conceptual improvements presented in this report are currently funded. The purpose of this study was to identify infrastructure deficiencies and potential solutions. This study provides a framework to identify and prioritize projects for the Town to seek funding from a variety of sources as discussed in this section as the recommendations are on roadways under a combination of local, state, and federal jurisdiction.

Funding for transportation improvements can come from a range of different sources, including federal, state, and local. In Massachusetts, the majority of large transportation construction projects are funded with a combination of federal transportation and required non-federal match, generally provided by the Commonwealth of Massachusetts.

Statewide funding that is allocated at MassDOT's discretion includes funding from all of the federal highway programs listed below:

- › Federal Highway Administration
- › National Highway Performance Program (NHPP)
- › Bridge (BR)
- › Highway Safety Improvement Program (HSIP)
- › Surface Transportation Program (STP)
- › Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- › Transportation Alternatives Program (TAP)

- › Federal Transit Administration

Available State Funding Considerations include:

- › **Chapter 90.** Chapter 90 entitles cities and towns to receive reimbursements on approved projects. It is a 100% reimbursable program. Chapter 90 funds are for capital improvement such as highway construction, preservation and improvement projects. These projects create or extend the life of capital facilities.
- › **MassWorks Infrastructure Program.** The MassWorks Infrastructure Program is a competitive grant program that provides the largest and most flexible source of capital funds to municipalities and other eligible public entities for public infrastructure projects that support and accelerate housing production, spur private development, and create jobs throughout the Commonwealth.
<https://www.mass.gov/service-details/massworks-infrastructure-grants>

State Funded Transportation Improvement Program (TIP)

The Southeast Regional Planning and Economic Development District (SPREDD) is the state-designated Metropolitan Planning Organization (MPO) for Somerset in accordance with federal transportation law. SPREDD is the lead agency, in cooperation with MassDOT, for planning and programming for the area's highways, transit, freight, bicycle and pedestrians. SPREDD is governed by a Commission of local officials and citizens.

The annual TIP cycle is as follows:

1. October–December: SPREDD gathers information about possible projects from MassDOT, municipalities, and the public;
2. December–February: SPREDD analyzes and evaluates potential construction projects based on the MPO's evaluation criteria;
3. March: Recommend projects for funding are identified based on the MPO staff's evaluations and factors such as project cost, project readiness, regional distribution of funding, and other planning priorities and constraints; and
4. April–May: Public review of the draft TIP document; incorporate feedback from municipalities and the public and agree on final list of transportation construction projects to program with federal funding; the MPO endorses the final TIP by the end of May.

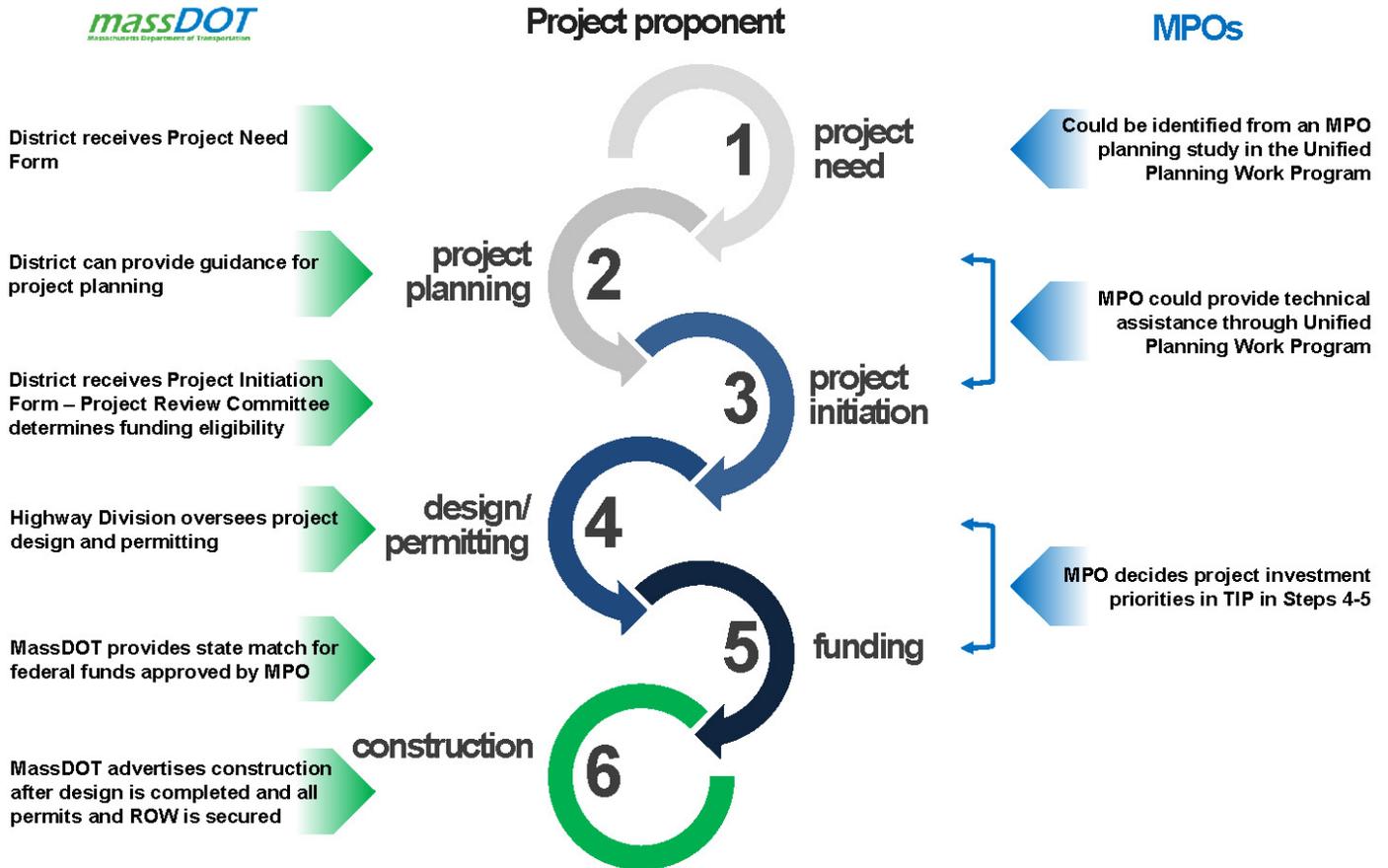
The chart on the following page depicts the TIP process for MassDOT. A Municipal TIP contact is responsible for communicating with MPO staff about TIP project-related matters. MPO staff has created several resources to guide TIP contacts and project proponents. To review key information and to submit the data that the MPO needs in order to evaluate a project, see the Project Proponent Questionnaire. For a step-by-step overview of the TIP Process, review the TIP How-To Presentation.

In order to be considered for TIP funding, a project must be approved by MassDOT. To streamline project approval, MassDOT has launched the new Massachusetts Project Intake

Tool (MaPIT), a web-based application that replaces Project Need and Project Initiation Forms. To access MaPIT, project proponents must obtain a login for MassDOT's GeoDOT Open Data Portal and navigate to the Project Intake Tool.

TIP funding sources include several categories:

- › Planning – Unified Planning Work Program
 - PL – Metropolitan Planning (or SPR – State Planning & Research) – FHWA funds for MPO planning activities
 - 5303 – Metropolitan Planning – FTA funds for MPO transit planning activities
 - Discretionary sources (mostly federally sourced)
- › Capital – Transportation Improvement Program
 - NHPP – National Highway Performance Program – Restricted to the National Highway System
 - STP - Surface Transportation Program – Flexible and broadly applied to multi-modal uses
 - HSIP – Highway Safety Improvement Program – Restricted to investments around proven safety areas
 - CMAQ – Congestion Mitigation Air Quality – Restricted to investments that benefit air quality
 - TAP – Transportation Alternatives Program – Competitive investment program for non-auto
 - Discretionary sources (mostly federally sourced such as TIGER)



Federal Funding Programs

Projects that have a regional significance, such as interchange modifications, could be eligible for federal funding through the following programs:

- › Fixing America's Surface Transportation (FAST) Act <https://www.fhwa.dot.gov/fastact/>
- › Federal Transit Administration (FTA) Transit Funding Grants <https://www.transit.dot.gov/grants>
- › Congestion Mitigation And Air Quality Improvement Program (CMAQ) and BUILD (Better Utilizing Investments to Leverage Development) Transportation Discretionary Grants Program <https://www.fhwa.dot.gov/federalaid/projects.pdf#page=21>
- › Highway Safety Improvement Program (HSIP) <https://www.fhwa.dot.gov/infrastructure/>
- › Surface Transportation Block Grant Program (STBG) <https://www.fhwa.dot.gov/federalaid/projects.pdf#page=167>

- › Transportation Alternatives Program (TAP) <https://www.fhwa.dot.gov/federalaid/>

5.3 Summary of Next Steps

The purpose of this study was to conduct an evaluation of I-195 Interchange 4 in Somerset, Massachusetts to identify circulation improvements, address inefficient traffic patterns, assess safety improvements, and evaluate how well the infrastructure handles new traffic demands from future developments.

The priority future development considered in this study is the re-development of the former Brayton Point Power Plant into the Brayton Point Commerce Center. Brayton Point will become a logistics, manufacturing, and support hub for offshore wind and other related industries supporting the emerging U.S. offshore wind energy sector.

This report, along with the Town's Comprehensive Master Plan, can be used as a planning tool to identify transportation priorities on a town-wide basis. Next steps for the Town include:

1. Synchronize the recommendations included in this study with other infrastructure priorities for the Town and develop a short, mid, and long term prioritized list.
2. Coordinate with MassDOT and SRPEDD for the opportunity to integrate the recommendations into the state transportation plan for funding purposes.
3. Prepare follow-on engineering studies and environmental reviews for the preferred options as required. For example, if the Town desires interchange modifications, the FHWA requires an Interchange Justification Report (IJR) be prepared. Doing so makes the projects as "shovel ready" as possible. Additionally, a MassDOT led Road Safety Audit (RSA) along the Route 103 corridor would be another recommended next step to advance project development.
4. Prepare cost estimates for the preferred corridors and develop an implementation strategy for each. For example, reserving and acquiring right-of-way where needed as applicable.
5. Coalesce support from Town stakeholders, such as businesses, residents and elected officials to advocate for the desired projects.